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California Independent
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California ISO

Rate Structure Proposal For the 2004 GMC Rate Structure Project

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California ISO White Paper on Rate Structure Proposal

1. Executive Summary

This white paper summarizes the California ISO's proposed 2004 GMC rate structure. We have worked closely with stakeholders and, wherever possible, this proposal includes concepts put forth in other parties' rate proposals. The proposal was developed by California ISO staff with the assistance and expertise of rate design consultants Barkovich & Yap Inc.

Overall, the proposal meets the imperatives of the FERC ALJ's Initial Decision to address further unbundling of CAISO rates, consider demand charges, and to consider alternative methods of cost assignment of certain cost centers. Compared to the current GMC, it contains elements such demand charges that would provide for a more stable revenue structure for the California ISO, while still maintaining some charges that vary depending on customers' participation in the markets. We believe it satisfies the criteria from the 2004 GMC Rate Structure Project Charter:

- Develop a rate structure that meets the FERC "just and reasonable" standard, and appropriately allocates ISO costs among the ISO's users;
- Develop a rate structure based on the principle of cost causation which charges customers for the cost of services that they use/cause;
- Design a rate structure that is easy to administer (including reasonably cost effective, and benefits of change should outweigh the costs) and understandable;
- Develop a rate structure that does not result in unmanageably adverse operational impacts;
- Develop a rate structure that is arrived at through an open and balanced stakeholder process;
- Recover approved ISO costs in a stable, low risk manner without excess volatility;
- Have the new rate structure filed with FERC by November 1, 2003, so that it can be effective January 1, 2004; and,
- Meet the terms of the 2002 GMC Settlement Agreement, which set forth issues to be covered in this 2004 GMC Stakeholder Process.

Under this proposal, the Grid Management Charge would consist of three separate functions. Two of the functions would be sub-functionalized – thus resulting in a total of six "buckets" for charging customers. These functions, with their associated sub-functions are:

1. **<u>Grid Reliability Services</u>** - Under Grid Reliability Services, the California ISO provides safe, reliable operation and maintenance of the Control Area, provision for transmission expansion, coordination with neighboring Control Areas, management of transmission flows and compliance with regional and national reliability standards.

    a. **Core Reliability Services (CRS)**- This service provides for reliable operation of a Control Area surrounded by other control areas and achieving minimal disruptions to system operation. In this sub-function, the ISO provides a stable grid and meets regional and national regulatory requirements, such as NERC and WECC reliability criteria and some FERC requirements (e.g., a basic level of transmission planning). All necessary activities attributable to Control Area operation including the capability of handling a system that is as geographically dispersed as the present system but without features that are scalable (i.e., that vary according to use or size of flow) are contained in this function. However, only a basic level of activity is contained in this service. The level of activity does not represent fully functioning operations for a robust Control Area in which there are outages and growth as new generation and transmission projects are developed.

b. **Energy and Transmission Services (ETS)** – This service represents the *scalable* portion of Grid Reliability Services, and is a function of the intensity of use of the transmission system within the Control Area and the occurrence of system outages and disruptions (e.g., weather-related incidents).

2. **Market Services** - Under Market Services, the California ISO provides access to its scheduling infrastructure, manages congestion to facilitate transmission flows, operates and maintains California ISO markets for participants, and monitors market performance. Contained in this function are activities related to the maintenance, monitoring, operation and performance of the forward and Real-Time markets. These activities span many of the activities within the California ISO's current Congestion Management and Ancillary Services/Real-Time Energy Operations services.

a. **Forward Scheduling** - The California ISO provides SCs with the ability to forward schedule energy and Ancillary Services and the processing of accepted Ancillary Services bids. In this context, a schedule is represented by a scheduling template (import, export, load, generation, inter-SC trade and Ancillary Services, including self-provided AS) submitted to the California ISO Scheduling Infrastructure.

b. **Congestion Management (CONG)** - The California ISO provides management and operation of inter-zonal congestion markets, using adjustment bids, taking Firm Transmission Rights and Existing Transmission Contracts into account, and determining the price for mitigating congestion for flows on congested paths. Congestion exists when power flowing on a transmission path exceeds the transmission path capacity. Congestion management is conducted by the California ISO during the scheduling process and results in the economic rationing of transmission service in order to prevent congestion. This currently provides for only inter-zonal congestion. Intra-zonal congestion is managed in real-time and thus incorporated in Core Reliability Services.

c. **Market Usage** - In this sub-function of Market Services, the California ISO processes supplemental energy and Ancillary Service bids, maintains and controls the Open Access Same-Time Information System (OASIS), monitors market performance, ensures generator compliance with market protocols, and determines market clearing prices. In the future, activities associated with forward energy markets will be included here.

3. **<u>Settlements, Metering and Client Relations</u> (CS)**- Under Settlements, Metering and Client Relations, the California ISO maintains customer accounts data, provides account information to customers, responds to customer inquiries, calculates market charges, processes settlement statements, resolves customer disputes and provides customer training. This function includes Settlements, Billing, and Metering activities as well as Client Relations. Some portion of Settlements activities are assigned to other functions. For example, RMR Settlements is assigned to CRS because its activities are related to the maintenance and provision of RMR services to the Control Area.

The table below summarizes the California ISO rate proposal. The indicative rates include billing determinants developed since the initial distribution of potential billing determinants for proposal development, including the number of schedules for the Forward Scheduling service category, and billable quantities on customer invoices. Historical billing determinants were taken from the period September 2001 to August 2002. Costs are the 2003 budgeted revenue requirement. Proposed rates for 2004 will be based on forecasted billing determinant volumes, and budgeted 2004 costs, as a result, the actual rates for 2004 will differ from those shown in the table below. Additionally, the rates and revenue requirements shown here are prior to the application of any mitigation or transitional measures that may be applied.

Summary of California ISO Rate Proposal Functionalization, Billing Determinants, Revenue Requirement and Rates						
Function	Reliability Services		Market Services			Settlements, Metering and Client Relations
Sub-Function	Core Reliability Services	Energy and Transmission Services	Forward Scheduling	Congestion Management	Market Usage	
Billing determinant	Gross non-coincident peak demand MW	Net Control Area Load plus exports and absolute value of net uninstructed deviations by settlement interval MWh	Final HA schedules submitted, no additional charge for changes to DA schedules	Net Scheduled Interzonal load (flows) MWh	Purchases and sales of Ancillary Services, instructed energy and absolute value of net uninstructed deviations by settlement interval MWh	Fixed charge per SC ID
Approximate revenue requirement (in millions)	$93.5	$38.2	$19.0	$10.0	$28.8	$47.9
Approximate billing determinant quantity (based on 9/2001-8/2002)	534,042 MW-months	242.5 TWh (load and exports) and 16.4 TWh (net uninstructed deviations)	12.3 million schedules	87.9 TWh	45.7 TWh	Approximately 1,562 customer months
Approximate rates not including Settlements, Billing and Client Relations adder	$175.16 per MW-month	$0.13 per MWh (load and exports) and $0.47 per MWh (net uninstructed deviations)	$1.55 per schedule	$0.11 per MWh of Scheduled Interzonal flow	$0.63 per MWh	$500 monthly per SC ID Remaining costs are associated with other billing determinants
Approximate rates including Settlements, Billing and Client Relations adder	$175.16 per MW-month	$0.23 per MWh (load and exports) and $0.87 per MWh (net uninstructed deviations)	$1.55 per schedule	$0.16 per MWh of Scheduled Interzonal flow	$0.85 per MWh	$500 monthly per SC ID
Revenue requirements, billing determinants and rates shown in this table are approximate amounts and are subject to change with further refinement in methods.						

2. Introduction

This document and its attachments detail the California Independent System Operator's (California ISO) rate structure proposal as part of the 2004 GMC Rate Structure Project to redesign the structure of its Grid Management Charge (GMC) in accordance with the Initial Decision in ER 01-313-000, *et. al.* and the Settlement Agreement in ER 02-250-000, *et. al.*. They also serve to describe and record the efforts of the California ISO in developing the proposal.

In developing this proposal, the California ISO and participants reviewed the rate structures of other North American Independent System Operators, Federal Energy Regulatory Commission (FERC) ratemaking standards and traditional and marginal cost ratemaking methodologies. In addition, the California ISO worked with participants to review the California ISO's current GMC structure and cost accounting methods and to develop a comprehensive listing of California ISO activities. The California ISO and participants also worked together to develop a list of potential billing determinants for use by any party in developing their own proposal.

The California ISO adopted, where possible, reasonable and appropriate concepts put forth in other parties' rate proposals. The California ISO also took note of the imperatives of the Initial Decision to unbundle California ISO rates, consider demand charges, and to look at alternative methods of cost assignment of certain cost centers.

The California ISO also kept in mind the criteria set forth in the 2004 GMC Rate Structure Project Charter (detailed in Section 1 of this document.)

3. Overview of Proposal

Table 1
Summary of the California ISO Rate Proposal
Functionalization and Billing Determinants

Function	Grid Reliability Services		Market Services			Settlements, Metering and Client Relations
Sub-Function	Core Reliability Services	Energy and Transmission Services	Forward Scheduling	Congestion Management	Market Usage and Services	
Billing Determinant	Non-coincident peak demand (MW)	(1) ISO Controlled Grid Load plus exports and (2) absolute value of net uninstructed deviations by settlement interval MWh	Final HA schedules submitted, no charge for changes to DA schedules	Net Scheduled Interzonal flows MWh	Purchases and sales of Ancillary Services, instructed energy and absolute value of net uninstructed deviations by settlement interval MWh	(1) Fixed monthly charge per customer (2) Remaining costs to be recovered by association with other billing determinants

The table above summarizes the functionalization aspect of the California ISO rate proposal. The Grid Management Charge would consist of three functions. Two of the functions would be sub-functionalized. These functions, with their associated sub-functions are:

1. Grid Reliability Services
    a. Core Reliability Services
    b. Energy and Transmission Services
2. Market Services
    a. Forward Scheduling
    b. Congestion Management
    c. Market Usage and Services
3. Settlements, Metering and Client Relations

These are described more fully below.

3.1 Grid Reliability Services

The California ISO provides for the safe, reliable operation and maintenance of the Control Area, provides for transmission expansion planning coordinates with neighboring Control Areas, manages transmission flows and complies with regional and national reliability standards.

The following is a partial listing of activities in Grid Reliability Services (a more complete list is in Attachment A):

- Monitoring of system conditions and dispatching to maintain reliability
- Coordination, communication, and integration with neighboring Control Areas
- Intertie scheduling
- Compliance with reliability standards
- Transmission and generation outage coordination
- Management, monitoring and approval of new generator interconnections
- Evaluation of transmission expansion
- Performance of operational studies, system security analyses and system planning studies to ensure overall reliability

Portions or all of the following systems can be attributed to Grid Reliability Services:

- Energy Management System (EMS)
- Bill's Interchange Transaction Management System (BITS)
- Out-of-Sequence and Out-of-Market Settlements Information System (OSMOSIS)
- Global Reliability Resource Management Application (GRMMA)
- Automated Dispatch System (ADS)
- Scheduling Logging for the ISO of California (SLIC)
- Generator Communication Project (GCP)
- Electronic Tagging (ETAG)

The Grid Reliability Services function consists of two sub-functions, Core Reliability Services and Energy and Transmission Services.

3.1.1 Core Reliability Services

The California ISO provides a basic level of reliable operation of a Control Area surrounded by other control areas and achieving minimal disruptions to system operation. In this sub-function, the California ISO provides a stable grid and meets regional and national regulatory requirements of such agencies as the North American Electric Reliability Council (NERC), the Western Energy Coordinating Council (WECC) the North American Energy Standards Board (NAESB), the Department of Energy and the FERC. All necessary activities attributable to Control Area operation including the capability of handling a system that is as geographically dispersed as the present system, but without features that are scalable (i.e., that vary according to use or size of flows) are contained in this function. However, only a basic level of activity is contained in this service. The level of activity does not represent fully functioning operations for a robust Control Area in which there are outages and growth as new generation and transmission projects are developed.

These services must be constantly available in order for the Control Area to operate reliably and must reflect the fact that the Control Area is interconnected with and interacting with other Control Areas and in compliance with all regulatory mandates placed on it.

Included in the costs of these services are the costs of systems applications necessary to operate the Control Area.

The charge to recover the costs of this service would be assessed on the metered non-coincident peak (NCP) demand of Scheduling Coordinators (SCs) on a monthly basis. The ISO is no longer proposing to calculate a separate adder for behind the meter Standby Load and behind the meter load of other entities. At this time, the ISO is waiting for the final Commission decision in the QF PGA, ER98-997-000 to determine how SCs may comply with the metering requirements of the ISO Tariff.[1]

3.1.2 Energy and Transmission Services

The California ISO provides for the safe, reliable operation of the Control Area assuming everyday (normal and extraordinary) operational requirements in which outages and disruptions (such as weather-related incidents) occur. This is the scalable portion of Grid Reliability Services that is necessary to respond to the everyday occurrence of system activity.

The level of activity is a function of the intensity of use of the transmission system within the Control Area and the occurrence of system outages and disruptions (e.g., weather-related

[1] The ISO Tariff requires SCs to schedule and meter gross demand and generation. However, the ISO waived this requirement for Qualifying Facilities pending a final FERC decision in ER98-997-000. An Initial Decision has been issued, but the Commission has not yet voted to affirm that decision.

incidents). This includes the services for simultaneously managing energy imbalances and transmission flows beyond those in a steady state Control Area.

For example, grid planning requires more resources in a control area that has growing load and significant need for new transmission and generation facilities. The use of the grid will be more intense if load-serving entities generate only part of their own power and buy part, bringing it to load centers through the grid within the Control Area. A higher level of net uninstructed deviations will increase the workload of the California ISO, since actions must be taken to offset these deviations to ensure system-wide balance in real time.

Included in the costs of Energy and Transmission Services are the scalable portion of systems applications and the hardware necessary to operate the Control Area.

In this sub-function, the level of activity within the Control Area drives costs. Thus, they will vary with the volume of flows and the level of net uninstructed deviations within a settlement period. Two volumetric billing determinants will be used: monthly ISO Controlled Grid Load[2] plus exports (MWh) and the absolute value of net uninstructed deviations by settlement interval (in MWh).

3.2 Market Services

Under Market Services, the California ISO provides access to its scheduling infrastructure, manages congestion to facilitate transmission flows, operates and maintains California ISO markets for participants, and monitors market performance.

Contained in this function are activities related to the maintenance, monitoring, operation and performance of the forward and Real-Time markets. These activities span many of the activities within the ISO's current Congestion Management and Ancillary Services/Real-Time Energy Operations services.

The following is a partial listing of activities in Market Services (a more complete list is found in Attachment A):

- Processing forward market schedules
- Adjusting forward market schedules to mitigate transmission congestion
- Maintaining market information postings
- Operating Real-Time market
- Determining market clearing prices
- Administering primary and secondary Fixed Transmission Rights markets
- Monitoring market performance

Portions or all of the following systems can be attributed to Market Services:

[2] The ISO Controlled Grid includes the system of transmission lines and associated facilities of the Participating Transmission Owners that have been placed under the ISO's Operational Control.

- Scheduling Infrastructure (SI)
- Scheduling Applications (SA)
- Open Access Same-Time Information System (OASIS)
- Automated Dispatch System (ADS)
- Balancing Energy Ex-Post Pricing (BEEP)
- Automated Load Forecasting (ALFS)
- Firm Transmission Rights (FTRs) and Secondary Registration System (SRS)
- Outage Scheduler (OS)
- Existing Transmission Contracts (ETC)
- Congestion Management (CONG)
- Day Ahead Data Analysis Tool (DADAT)
- Hour Ahead Data Analysis Tool (HADAT)

The Market Services function consists three sub-functions, (1) Forward Scheduling, (2) Congestion Management, and (3) Market Usage and Service.

3.2.1 Forward Scheduling

The California ISO provides SCs with the ability to forward schedule energy and Ancillary Services and the processing of accepted Ancillary Services bids. In this context, a schedule is represented by a scheduling template (import, export, load, generation, inter-SC trade and Ancillary Services, including self-provided AS) submitted to the California ISO's Scheduling Infrastructure.

The following is a partial listing of activities in Forward Scheduling:

- Processing forward energy schedules, including inter-SC trades
- Reviewing and verifying schedules

The ISO processes schedules to confirm path ratings are not exceeded, to ensure that sufficient Ancillary Services (self-provided or market) are or will be procured and that SC portfolios are balanced.

The costs incurred by the California ISO are more closely correlated with the number of schedules than energy volumes, since the basic effort encompasses processing the schedules and bids regardless of the volume within the transactions. The billing determinant will be the number of final hour-ahead schedule templates submitted, not including changes to the DA schedule (so as not to discourage load-following).

3.2.2 Congestion Management

The California ISO provides management and operation of inter-zonal congestion markets, using adjustment bids, taking Firm Transmission Rights and Existing Transmission Contracts[3] into account, and determining the price for mitigating congestion for flows on congested paths. Congestion exists when power flowing on a transmission path exceeds the transmission path capacity. Congestion management is conducted by the California ISO during the scheduling process and results in the economic rationing of transmission service in order to prevent congestion. This currently provides for only inter-zonal congestion. Intra-zonal congestion is managed in real-time and thus incorporated in Core Reliability Services.

This service is similar to the CONG service in the current GMC rate design, but is not identical due to the other changes in this proposed rate design. When LMP is implemented, congestion management activities will be functionalized and their associated costs will be assigned to other service categories, eliminating this service category.

The costs of this service would be recovered through an assessment on net Hour-Ahead scheduled inter-zonal flows (loads).

3.2.3 Market Usage

In this sub-function of Market Services, the California ISO processes supplemental energy and Ancillary Service bids, maintains and controls the Open Access Same-Time Information System (OASIS), monitors market performance, ensures generator compliance with market protocols, and determines market clearing prices. In the future, activities associated with forward energy markets will be included here.

The following is a partial listing of activities in Market Usage and Service (a more complete list is in Attachment A):

- Maintaining market information postings
- Operating Real-Time market
- Determining market clearing prices
- Monitoring market performance

The costs of this service would be recovered through a per MWh charge on purchases and sales of Ancillary Services, instructed energy and the absolute value of net deviations by Settlement interval by SC ID. Self-provided Ancillary Services would not be assessed this charge.

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[3] The ISO Tariff defines Existing Contracts as "the contracts which grant transmission service rights in existence on the ISO Operations Date (including any contracts entered into pursuant to such contracts) as may be amended in accordance with their terms or by agreement between the parties thereto from time to time." Further clarification on the ISO's responsibility with respect to Existing Contracts can be found in Sections 2.4.3 (Existing Contracts for Transmission Service) and 2.4.4 (ISO Administration of Existing Contracts for Transmission Service). The list of Existing Contracts can be found in Appendix B to the Transmission Control Agreement.

3.3 Settlements, Metering and Client Relations

Under Settlements, Metering and Client Relations, the California ISO maintains customer account data, provides account information to customers, responds to customer inquiries, calculates market charges, processes settlement statements, resolves customer disputes and provides customer training. This function includes Settlements, Billing, and Metering activities as well as Client Relations. Certain Settlements activities and some Contracts and Special Projects activities are assigned to Core Reliability Services. For example, RMR Settlements is assigned to CRS because its activities are related to the maintenance and provision of RMR services to the Control Area. Similarly, Contracts and Special Projects has a primary role in the administration of the Transmission Access Charge and the development of Metered SubSystems.

The following is a partial listing of activities in Settlements, Metering and Client Relations (a more complete list is in Attachment A):

- Determine charges associated with transmission services, forward market schedules, Real-Time balancing market, congestion management and administrative charges
- Maintain and process Settlements data
- Perform Settlement statement re-runs
- Manage and monitor SC credit and collateral
- Collect and validate meter data
- Provide ISO Tariff guidance to Market Participants
- Facilitate resolution of Market Participant issues
- Provide training to Market Participants

Portions or all of the following systems can be attributed to Settlements, Metering and Client Relations:

- Out-of-Sequence, Out-of-Market Settlements Information System (OSMOSIS)
- Balance of Business Systems (BBS)
- Meter Data Acquisition System (MDAS)

Settlements, Metering and Client Relations activities are essential to maintaining any connection between the SCs and the California ISO, regardless of the actual degree of service taken from the California ISO. It can be seen that there are major costs associated with this function. Thus, the mitigation of the bill impacts of assigning these costs on a per customer basis is essential and appropriate. For that reason, the California ISO proposes to recover these costs using both a small fixed monthly charge and a variable charge.

The fixed monthly charge is $500 per SC ID. The remaining Settlements, Metering and Client Relations costs will be associated with the billing determinants of Energy and Transmission Services, Congestion Management and Market Usage. The billing determinants for these services are ISO Controlled Grid Load plus exports and net uninstructed deviations (Energy and Transmission Services), net scheduled interzonal flows (Congestion Management) and purchases and sales of Ancillary Services, instructed energy, and net uninstructed deviations (Market Usage). We made the decision not to associate costs to either Core Reliability Services or

Forward Scheduling as these were new rates and any additional costs would increase the severity of bill impacts.

In order to associate the remaining costs with the other billing determinants, Barkovich and Yap and the ISO reviewed the occurrence of charge types in Settlement Statements over the test year period, September 2001 through August 2002. The occurrence of charge types in Settlement Statements is a measure of the activity flowing through Settlements. We associated each charge type with one of the three services above. The Settlement, Metering and Client Relations costs associated with each billing determinant were proportional to the relative number of charge types associated with each service.

4. Comparison to Other ISOs/RTOs

Comparisons with other ISOs are difficult as there is no standard for ISO rates. It is also made difficult by the application of the FERC Uniform System of Accounts that were created for application to traditional integrated electric utilities. Nonetheless, in the following we attempt to make some high level comparisons between the California ISO's proposed new rate structure and that of other ISOs/RTOs. These comparisons are shown in Attachment B, in which we compare ISO functions and the method of recovery.

4.1 Grid Reliability Services

Of the five other ISOs (ISO-NE, NYISO, PJM, ERCOT and MISO), only ISO-NE and PJM have "Reliability" functions. ISO-NE's Schedule 3, Reliability Administration, appears to be similar to the California ISO's proposed Grid Reliability Services function. ISO-NE's billing determinant is non-coincident peak demand.

PJM's reliability functions are Schedule 9-1, Control Area, Schedule 9-5, Regulation and Frequency Response, and Schedule 9-7, Capacity and Resource Obligation Management. Schedules 9-1 and 9-5 are recovered through MWh assessments. Schedule 9-1 is recovered through an assessment on point-to-point and network integration services flows in MWhs. Schedule 9-5 is recovered through an assessment on PJM regulation and scheduled regulation, including self-scheduled regulation. Schedule 9-7 is allocated to PJM East and PJM West by their relative non-coincident peaks. Within each region, the cost is recovered by an assessment on resource obligations in MW-days.

4.2 Market Services

Of the other ISOs/RTOs, only ISO-NE and PJM have separate market functions. The market functions of the ISO-NE can be found in Schedule 1-Scheduling, System Control and Dispatch and Schedule 2-Energy Administration. Schedule 1 costs are recovered through an assessment on "monthly Network load in kWs plus the highest amount of reserved capacity of point-to-point transmission plus the highest amount of authorized use." Schedule 2 costs are recovered by assessments on Transaction Units (bilateral contract block hours plus generator block hours plus net deviation block hours) and on load and injections (generation). Fifteen percent of the Schedule 2 costs are recovered from Transaction Units and 85 percent from load and injections.

The market functions of PJM can be found in Schedule 9-4-Market Support, and Schedule 9-3-Fixed Transmission Rights. Market Support costs are recovered from generation and load MWhs. Fixed Transmission Rights costs are recovered through a charge on FTR MW per hour summed over hours. (Essentially, this converts the FTR MWs to MWhs over the year.)

4.3 Settlements, Metering and Client Relations

None of the other ISOs/RTOs have an explicit, separate Settlements, Metering and Client Relations function. All except the MISO have annual fees. These fees are described in Attachment B. ISO-NE, PJM and ERCOT have fixed annual fees varying from $2,000 (ERCOT) to $5,000 (ISO-NE and PJM). The NYISO and the Ontario IMO have tiered fees that vary by the amount of load an entity has. The NYISO has a $5,000 fee for all other companies that do not have load.

4.4 Startup Costs

Only the NYISO has explicit recovery of start-up costs. For 2003, the monthly amount recovered is $1,095,881. This amount is assessed equally to customers receiving transmission services under the Open Access Transmission Tariff (OATT) and to customers receiving Location Based Marginal Pricing (LBMP) market services. The current rate for those receiving service under the OATT is $0.046223 per MWh, and the current rate for those receiving LBMP service is $0.047346 per MWh.

5. Cost Assignment Process

The process of identifying and assigning costs to functions and sub-functions was an iterative one. As the California ISO proposal developed, the California ISO's consultants, Barkovich and Yap, Inc., reviewed the current method of cost assignment using the Budget Tool and the resulting structure in the Cost Allocation Matrix (CAM). They then laid out a process in which directors and managers of directly assignable cost centers were asked to assign costs to the California ISO's proposed functions and sub-functions, ultimately to provide data for the ISO's Cost Allocation Matrix

Each set of directors and managers provided three major items. First, they provided a description of their cost center activities to each function or sub-function. Second, they assigned their personnel to the function or sub-function. Finally, they provided a justification of their personnel assignments. The results were tabulated in worksheets, which form the basis for the direct personnel assignments in the CAM.

Barkovich and Yap worked directly with most of the directors and managers, querying results, asking for clarifications, and compiling results. In most cases several meetings and conference calls were required before personnel assignments were completed.

For those cost centers that were not directly assignable, several different methods of assignment were used. The main methods were proportional to:

- Supervised cost center assignments;
- Departmental cost center assignments;
- Total directly assigned operating costs; or
- Total operating cost assignments.

The cost assignment of capital expenditures followed a method similar to that done for cost centers. Whenever possible, capital expenditures were directly assigned. This assignment was done in an iterative process by the directors and managers of the cost centers that utilized the systems. For those capital expenditures that could not be directly assigned, one of the methods in the list above was used.

The results of the cost assignments were linked to the CAM to create the revenue requirements for each function or sub-function. The resulting assignments are shown in the table below:

Table 2
Revenue Requirements by Function

Grid Reliability Services		
Core Reliability Services	$	93,544,836
Energy and Transmission Services*		
Load and exports	$	30,670,132
Net Uninstructed Deviations	$	7,667,533
Total Grid Reliability Services	$	131,882,501
Market Services		
Forward Scheduling	$	19,039,848
Congestion Management	$	10,017,448
Market Usage	$	28,775,078
Total Market Services	$	57,832,374
Settlements, Metering and Client Relations	$	47,885,496
Total Revenue Requirement after application of reserve	$	237,600,371

Revenue requirements shown are based on 2003 Budget information. Cost assignments are preliminary. Further refinement may cause these assignments to change, and allocations will vary as a result of differing costs in the 2004 revenue requirement.
*The Energy and Transmission Services costs are allocated 80 percent to Load and exports and 20 percent to net uninstructed deviations. This allocation was based on professional judgment.

6. Billing Determinants For Each Service

The California ISO and participants identified a number of potential billing determinants for use by participants and the California ISO early in the Project. This was done to allow the California ISO to begin collection of data and to prevent a lack of data from impeding progress on consideration of alternative rate designs. These list of possible billing determinants was posted on the GMC project website[4].

As the California ISO proposal developed and the rate functions crystallized, we analyzed the various potential billing determinants for their suitability for use. This suitability analysis looked at two factors. We preliminarily determined if the billing determinant was causally related to the function for which it was to be used. Then we considered the billing determinant's potential stability, impact on operations and market participant behavior, and its availability in the Settlements system.

Based on this assessment, the California ISO determined that looking beyond the initial list of potential billing determinants was necessary. We found that certain transaction data were suitable for use as a billing determinant. This transaction data is discussed below.

6.1 Core Reliability Services

Core Reliability Services are the basic services needed to manage the Control Area reliably and safely. The billing determinant for this function should be reflective of the costs of maintaining operational control at all times of the day and seasons of the year, as well as the stress that entities place on the transmission system. The billing determinant selected is the monthly non-coincident peak (NCP) *demand* on a gross basis. An entity's NCP demand reflects the burden that the entity places on the operation of the transmission system.

Staff rejected use of an entity's coincident peak (CP) demand as the billing determinant. The coincident peak demand would not reflect the burden on system operation of entities whose peaks are not coincident with the system peak. Core Reliability Services must be provided at all times of the day, even to entities that have NCP demand occurring in the middle of the night.

6.2 Energy and Transmission Services

Contained within Energy and Transmission Services is the scalable portion of Grid Reliability Services. Scalability implies an increasing relationship with flows, outages and disturbances within the Control Area. The costs of managing the Control Area will be higher to the extent that total flows increase. They will also be higher to the extent that entities cause inadvertent flows that must be managed in real time. The billing determinants selected by the California ISO are the monthly ISO Controlled Grid Load plus exports and the absolute value of net

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[4] http://www.caiso.com/docs/09003a6080/1e/f7/09003a60801ef7fb.pdf.

uninstructed deviations by Settlement interval. The first billing determinant represents total flows and the second represents inadvertent flows on the transmission grid.

The absolute value of net uninstructed deviations by Settlement interval is calculated as the absolute value of the difference between instructed energy and actual energy delivered net of changes in load. Allowing netting for changes in load permits SCs to load follow (match changes in load with changes in generation), which reduces inadvertent flows on the transmission grid.

6.3 Forward Scheduling

Forward Scheduling contains the activities associated with accepting, processing, and validating Day-Ahead and Hour-Ahead schedules. A schedule in this context is a template (import, export, load, generation, inter-SC trade, or Ancillary Service) submitted to the Scheduling Infrastructure. The costs in this sub-function relate to providing the infrastructure and to processing schedules.

All schedules are processed for each hour regardless of the time of submission. Scheduling applications run discretely for each hour and problems are resolved for each hour. The ISO re-processes each hour of a Day-Ahead schedule that rolls to the Hour-Ahead, even if it is unchanged.

The billing determinant selected by the California ISO for Forward Scheduling is the number of final Hour-Ahead schedules submitted. Only final Hour-Ahead schedules are assessed this charge. In order not to discourage SCs from modifying their Day-Ahead schedules due to better information, any changes from Day-Ahead schedules that roll over to the Hour Ahead will not be assessed an additional charge.

6.4 Congestion Management

Congestion Management contains the activities associated with mitigating scheduled transmission flows across Inter-zonal boundaries. To the extent flows increase across zonal boundaries, the California ISO incurs costs to monitor and potentially mitigate Inter-zonal congestion.

The billing determinant for Congestion Management will be assessed on net Hour-Ahead Scheduled Inter-zonal flows (load). This is the current billing determinant for the Congestion Management charge. An SC will be assessed this charge on a per MWh basis each time it schedules a flow across an Inter-zonal interface.

6.5 Market Usage

Market Usage contains the activities associated with processing Supplemental Energy and Ancillary Services, determining the Real-Time Market Clearing Price, maintaining and controlling the OASIS, monitoring market performance, and ensuring generator compliance with market protocols. In the future, activities associated with forward energy markets will be included here.

The costs of Market Usage will be recovered from those SCs that use the Real-Time market (and the forward energy markets in the future) in a charge based on usage of these markets. The billing determinant for Market Usage will be purchases and sales of Ancillary Services, Instructed Energy and the absolute value of net portfolio deviations by Settlement interval.

This differs from the billing determinant of the current Ancillary Services/Real-Time Energy Operations Charge in that the absolute value of **net** portfolio deviations is used rather than the absolute value of **total** deviations. As was mentioned earlier, to the extent an SC accurately load follows, the California ISO need not purchase Imbalance Energy. The use of net portfolio deviations is a specific mitigation not to discourage load following.

6.6 Settlements, Metering and Client Relations

Settlements, Metering and Client Relations contains most Settlements, Billing, Metering, and Client Relations activities. Settlements, Metering and Client Relations costs are a function of the interaction of the customer and the California ISO. As many of these costs are fixed in nature, such as the requirements for settlements, billing, and processing meter data, cost recovery through a fixed charge per customer may be appropriate. There are variations in the complexity of these interactions between the California ISO and its numerous customers, which militate against recovering these costs solely through a fixed charge.

If the California ISO recovered a major portion of these costs through a single fixed charge per customer, the bill impacts would be significant. As a mitigation measure, the California ISO proposes to recover a portion of Settlements, Metering and Client Relations costs through a $500 per month customer charge per SC ID regardless of the level of activity.

As described above, the remaining Settlements, Metering and Client Relations costs have been associated with the billing determinants of Energy and Transmission Services, Congestion Management and Market Usage. The billing determinants for these services are ISO Controlled Grid Load plus exports and net uninstructed deviations (Energy and Transmission Services), net Hour-Ahead scheduled interzonal flows (Congestion Management) and purchases and sales of Ancillary Services, instructed energy, and net uninstructed deviations (Market Usage). We made the decision not to associate costs to either Core Reliability Services or Energy and Transmission Services as these were new rates and any additional costs would increase the severity of bill impacts.

Barkovich and Yap and the ISO reviewed the occurrence of charge types in Settlement Statements over the test year period, September 2001 through August 2002. We view the occurrence of charge types in Settlement Statements as a measure of the activity flowing through Settlements. We then associated each charge type with one of the three services above. The

Settlement, Metering and Client Relations costs associated with each billing determinant were proportional to the relative number of charge types associated with each service.

Table 3
Billing Determinants by Function and Sub-Function

Grid Reliability Services	
Core Reliability Services	534,042 MW-months (NCP demand)*
Energy and Transmission Services	
Controlled Grid Load plus exports	239,850,597 MWh
Absolute value of net uninstructed deviation by interval	16,403,169 MWh
Market Services	
Forward Scheduling	12,307,710 schedules
Congestion Management	87,927,387 MWh
Market Usage	45,707,872 MWh
Settlements, Metering and Client Relations	1,562 customer months

The California ISO collected billing determinants for the twelve-month period September 2001 through August 2002. This was done to facilitate the release of masked SC-specific information to participants under the conditions of providing data at least six months old. The California ISO will review more recent historical data to determine if the collected data is representative.

7. Proposed Rates

Based on the process outlined in this paper, the resulting rates are shown in Table 4. We caution that these rates are indicative of the rates that would apply using budgeted costs for the year 2003. Therefore, these can be only illustrative of the actual rates for 2004.

Table 4
Indicative Rates by Function and Sub-Function

	Service alone	Including Settlements, Metering and Client Relations adder
1. Grid Reliability Services		
a. Core Reliability Services	$175.16 per MW-month of NCP demand	$175.16 per MW-month of NCP demand
b. Energy and Transmission Services		
Controlled Grid Load plus exports*	$0.128 per MWh	$0.237 per MWh
Absolute value of net uninstructed deviation by interval	$0.467 per MWh	$0.865 per MWh
2. Market Services		
a. Forward Scheduling	$1.547 per schedule submitted	$1.547 per schedule submitted
b. Congestion Management	$0.114 per MWh	$0.164 per MWh
c. Market Usage	$0.630 per MWh	$0.850 per MWh
3. Settlements, Metering and Client Relations	$500 monthly per SC ID	$500 monthly per SC ID

The functionalization undertaken here reflects an effort to maximize the cost basis of the California ISO's rates. In order to implement this functionalization, it is anticipated that there will be bill impacts that require mitigation. These bill impacts will be studied in depth along with the bill impacts of other proposals. Rates will be adjusted in order to reduce the level of bill impacts to a manageable and reasonable level while preserving the cost basis of the rates to the greatest extent possible.

8. Remaining Issues

As in any undertaking of this magnitude, there are a number of remaining issues that the California ISO and participants must consider. These include:

1. Potential increased use of direct assignments of indirect expenditures. Participants in the 2004 GMC Rate Structure Project have requested that the CAISO make an effort to use the direct assignment approach versus an allocation approach in cost assignment process. For this proposal, we have directly assigned costs to the extent possible, and will continue to try to improve the cost allocation process that will be used in the rate filing made in fall 2003.

2. Potential refinement in the definition of the billing determinants. Based on past experience, in the transition from the conceptual design to the implementation of a rate design proposal, some minor modifications related to the definition of proposed billing determinants may be necessary. In the past, the need for such potential changes has been discovered during the drafting of tariff language, or in the development of formulas used to modify the billing system to implement the GMC structure.

ATTACHMENTS

A. Functionalization of Activities into Service Categories

B. Comparision of Rate Structures of other ISOs

CALIFORNIA ISO

California Independent
System Operator

Cost Assignment Method For 2004

GMC Unbundling Kickoff Meeting

Ben Arikawa
Senior Financial Analyst

August 11, 2003

Topics

- Rate Design 101
- ISO Rate Proposal
- Cost Assignment Method

Rate Design 101

- Defining/Designing Services
- Assigning Costs
- Developing Method of Cost Recovery
- Mitigation of Bill Impacts

ISO Rate Proposal

- ***Operating the Grid*** – **Grid Reliability Services**
  - Core Reliability
  - Energy and Transmission
- ***Creating and Operating Markets*** – **Market Services**
  - Forward Scheduling
  - Congestion Management
  - Market Usage
- ***Serving Customers*** – **Settlements, Metering and Client Relations**

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Grid Reliability Services

Core Reliability

- Core activities of the ISO as the Control Area operator
- Billing determinant
  - Metered non-coincident peak demand (MW-months)

CALIFORNIA ISO

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Grid Reliability Services
Energy and Transmission

- Operating the Grid to ensure the ISO's ability to manage flows and meet contingencies
- Billing determinants
  - Load and exports (MWh)
  - Net uninstructed deviations (MWh)

Market Services

Forward Scheduling

- **Processing energy schedules and awarded Ancillary Services bids**
- **Billing determinant**
  - Count of number of final Hour-Ahead schedules processed
    - Load, generation
    - Import, export
    - Inter-SC trade
    - Awarded Ancillary Services (market and self-provided)

Market Services

Congestion Management

- Monitoring and managing interzonal flows
- Billing determinant
  - Net scheduled Hour-Ahead interzonal flows (MWh)

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Market Services

Market Usage

- Creating, operating and maintaining markets
- Billing determinant
  - Purchases and sales of Ancillary Services, Instructed Energy and net uninstructed deviations (MWh)

Settlements, Metering and Client Relations

- Metering, billing, customer training and resolving disputes
- Billing determinant
  - Monthly fee per customer
  - Mitigation of bill impact - Association of costs with related services

CALIFORNIA ISO
Rates

California Independent
System Operator

Designing Services	Grid Reliability			Market Services			Settlements Metering Client Relations
	Core	ETS Load	ETS Deviations	FS	Cong	MU	
Assigning Costs (millions)	$93.5 (39%)	$30.7 (13%)	$7.7 (3%)	$19.0 (8%)	$10.0 (4%)	$28.8 (12%)	$47.9 (20%)
Billing Determinants	534,032 MW mos.	239.9 million MWh	16.4 million MWh	12.3 million schedules	87.9 million MWh	45.7 million MWh	1,562 customer months
Preliminary Rates	$175	$0.13	$0.47	$1.55	$0.11	$0.63	$500
Mitigation		$0.11	$0.40		$0.05	$0.22	
Resulting Rate	$175 per MW-mo	$0.24 per MWh	$0.87 per MWh	$1.55 per final HA schedule	$0.16 per MWh	$0.85 per MWh	$500

Figures are shown only for illustrative purposes. Actual costs, cost assignments and rates for 2004 will be the result of further analysis using 2004 Budget data.

Cost Assignment Method

- See Attachment A for list of cost centers
- Review descriptions of functions
- Review activities list (update if necessary)
- Apportion labor (people) to functions
- Apportion contracts to functions
- Review and update activities
- Review and update justification
- By COB August 26, 2003

Important Items

- Separate accounting for contracts
- Review and update other documentation

Documents

- List of direct cost centers
- ISO White Paper
- Listing of activities to functions
- Cost Assignment Templates

Who To Call

- Ben Arikawa (ext. 5958)
- Phil Leiber (ext. 2168)
- Cathy Yap (510-450-1270)
- Barbara Barkovich (415-457-5537)

APPENDIX 4, ATTACHMENT A: Functionalization of Activity Groupings for ISO Rate Structure (SUBJECT TO CHANGE)

Function	Sub-Function	Direct Personnel	Activities within proposed Grouping	Indicative Cost Centers (There is some overlap among cost centers)
Grid Reliability Services	Core Reliability Services (base level) Energy and Transmission Services (scalable portion)	Real-Time Grid Operations • RT Grid Resource Coordination • Gen Dispatchers • RT Intertie Scheduling • Trans Dispatchers	Ancillary Services management: • Dispatch of energy associated with Ancillary Services, including: o Regulation o Spin o Non-spin o Replacement reserve o Black start Monitoring of system conditions and dispatching to maintain reliability: • Load and resource balancing • Transmission line/path congestion management • Voltage control • Frequency control • System emergency management • Power flow studies and security analyses Determination of resource adequacy in real time Coordinating Western Interconnection reliability with all WECC Reliability Coordinators Integration and communication with other Control Areas: • Interconnected switching operations for planned and unplanned outages • Generation and transmission equipment outage coordination Interchange scheduling ETC scheduling and administration EMS and Telemetry management	1544 – Real Time Scheduling 1564 – Operations Scheduling 1546 – Security Coordination 1545 – Grid Operations 1566 – Regional Coordination 1461 – Control Systems 1752 – Manager of Markets (portion) 1462 – Field Data Acquisition (portion)

APPENDIX 4, ATTACHMENT A: Functionalization of Activity Groupings for ISO Rate Structure (SUBJECT TO CHANGE)

Function	Sub-Function	Direct Personnel	Activities within proposed Grouping	Indicative Cost Centers (There is some overlap among cost centers)
Grid Reliability Services	Core Reliability Services (base level) Energy and Transmission Services (scalable portion)	Interchange Pre-Scheduling WECC Requirements	Day-ahead/Hour-ahead intertie scheduling • ETAG (NERC-required electronic schedule tagging) • Existing Transmission Contracts Calculator (ETCC) and scheduling • New Firm Uses (NFU) scheduling Reconciliation of schedules and interchange after-the-fact NERC/WECC/CAISO Tariff required reporting Weekly: • Inadvertent Interchange report • NERC reports (Inadvertent Interchange, ETAG) • WECC "donut" report Monthly: • WECC Unscheduled Flow curtailment report Quarterly: • Quarterly California Energy Commission 1305 report Annually: • SDG&E DOE report • FERC 714 report • Report of Economic Operation	1565 – Pre-scheduling and Support
Grid Reliability Services	Core Reliability Services (base level) Energy and Transmission Services (scalable portion)	Outage Coordination	Pre-planning of and preparation for generation and transmission outages Generation and transmission equipment outage tracking and data/record keeping On-site generation outage monitoring (SB-39 compliance) Outage reporting (web site updates and regulatory agency reporting) Supply of Generation and Transmission data for OASIS postings	1542 Outage Coordination

APPENDIX 4, ATTACHMENT A: Functionalization of Activity Groupings for ISO Rate Structure (SUBJECT TO CHANGE)

Function	Sub-Function	Direct Personnel	Activities within proposed Grouping	Indicative Cost Centers (There is some overlap among cost centers)
Grid Reliability Services	Core Reliability Services (base level) Energy and Transmission Services (scalable portion)	Operations Engineering and Maintenance	Transmission Maintenance: • Develop, monitor and control activities and processes associated with transmission maintenance standards, protection standards and Gen interconnection standards • Manage internal requirements and oversee new generation interconnections and processes to ensure the ISO is ready to Operate new facilities including all the annual PTO Transmission system modifications or upgrades. Support Transmission Planning in project tracking and data management. • Manage, analyze, prepare reports on system availability, reliability, and outage records. • Manage, amend, audit, investigate, approve PTO Transmission Maintenance Practices. • Manage the processes and review and approve PTO submitted line and equipment ratings. • Review new technology, engineering decisions and standards and associated processes to ensure they support grid reliability. Operations Engineering: • Perform seasonal, annual, and, as necessary special analysis of transmission system performance and ratings. • Review, approve and provide specification on daily system configurations, emergency conditions, clearances and operational conditions. • Develop, prepare and update operating procedures. • Perform operational studies and system security analyses • Coordinate with neighboring control area on reliability/operation/engineering issues • Provide 24/7 on-call support to real-time grid operations including WECC Reliability Coordinators • Support regional planning, transmission and generation projects	1558 – Transmission Maintenance 1562 – Operations Engineering, North 1561 – Operations Engineering, South

APPENDIX 4, ATTACHMENT A: Functionalization of Activity Groupings for ISO Rate Structure (SUBJECT TO CHANGE)

Function	Sub-Function	Direct Personnel	Activities within proposed Grouping	Indicative Cost Centers (There is some overlap among cost centers)

Grid Reliability Services	Core Reliability Services (base level)
	
	Energy and Transmission Services (scalable portion)
		Operations Support and Training	Operations Support:
			• Manage the development, preparation and revision of all ISO Operating Procedures:
			  • Transmission grid
			  • Market Operations
			  • Generation
			  • Emergency
			• Perform generating unit ancillary service certification and P-MAX testing
			• Manage UDC and Inter-Control Area Operating agreements
			• Manage dynamic energy scheduling agreements and interfaces
			• Manage required WECC Reliability Management System (RMS) and NERC
			• Maintain Compliance Program data collection, tracking, storage and reporting processes
				1554 – Special Projects Engineering
				1549 – Operations Training Group
				1555 – Operations Support Group
				1559 – Operations Application Support
				1563 – Coordinated Operations

APPENDIX 4, ATTACHMENT A: Functionalization of Activity Groupings for ISO Rate Structure (SUBJECT TO CHANGE)

Function	Sub-Function	Direct Personnel	Activities within proposed Grouping	Indicative Cost Centers (There is some overlap among cost centers)
Grid Reliability Services	Core Reliability Services (base level) Energy and Transmission Services (scalable portion)	Loads & Resources Grid Planning Regional Coordination	Loads and Resources adequacy: • Perform Long-term (monthly, annual and longer) load forecasting • Manage, develop, prepare, publish and participate in seasonal system load and generation assessments. • Participate, guide, influence, and maintain records on environmentally constrained generation units. • EMS Network Model and Applications Support • Construct, tune, and maintain an accurate Network Model for use in the EMS State Estimator and Dispatch Load Flow. • Establish and support the EMS Network Applications such as Contingency Analysis and Dispatcher. • Identify SCADA data measurement needs, changes, and mapping to the Network Model Transmission Planning: • Perform system transmission planning to ensure overall reliability • Perform reserve requirement studies • Determine long term *transmission* resource adequacy • Determine Reliability Must-Run ("RMR") contract requirements • Review Participating Transmission Owners ("PTOs") Bulk Power Program and new generator or load interconnection studies • Determine dual fuel generator requirements Regional Coordination: • Coordinate participation in NERC, WECC, NAESB, ESC, and OSC • Monitor and participate in resolving seams issues in the Western Interconnection • Provide Control Area and interconnection mapping services to real time operations.	1543 – Loads and Resources 1521 – Grid Planning 1566 – Regional Coordination
Grid Reliability Services	Core Reliability Services (base level)	Reliability Contract Administration	Administration of RMR settlements Validation of Summer Reliability Generation invoices Development and implementation of Tariff modifications Maintenance of agreements with existing and new clients Meeting regulatory directives related to contract activities Non-vendor contract administration	1723 Tariff and Contracts Implementation 1731 Contracts and Special Projects (portion)

APPENDIX 4, ATTACHMENT A: Functionalization of Activity Groupings for ISO Rate Structure (SUBJECT TO CHANGE)

Function	Sub-Function	Direct Personnel	Activities within proposed Grouping	Indicative Cost Centers (There is some overlap among cost centers)
Grid Reliability Services	Energy and Transmission Services (scalable portion)	Market Monitoring and Compliance	Evaluation of transmission capacity expansion Review and recommend changes to ISO rules and protocols Monitor and measure operational performance consistent with contractual commitments and Tariff requirements Ensure generator compliance with dispatch instructions and must offer requirements Administer ISO Oversight and Investigations Review	1641 – Market Analysis (portion) 1642 – Market Surveillance Committee (portion) 1661 – Compliance (portion) 1662 – Data Quality Group (portion)
Market Services	Forward Scheduling	HA Grid Resources Coordination DA Grid Resources Coordination Markets & Scheduling Group (portion) Market Operations (portion) Market Engineering (portion) Business Solutions (portion) Market Integration (portion) Congestion (portion) ETCs	Manage transmission and generation schedules: • Day and Hour-Ahead schedules (including Participating Intermittent Resources) • Determine schedule feasibility	1752 – Manager of Markets (portion) 1753 – Market Application and Testing 1755 – Business Solutions (portion) 1757 – Market Integration (portion)
Market Services	Congestion Management	Congestion (portion)	Manage inter-zonal congestion	1752 – Manager of Markets (portion) 1753 – Market Application and Testing 1755 – Business Solutions (portion) 1757 – Market Integration 1756 – Market Quality (portion)
Market Services	Congestion Management	Marketing monitoring	Monitoring and reporting on congestion management market performance Investigating and reporting on potential gaming and market power abuses (congestion)	1641 – Market Analysis (portion) 1642 – Market Surveillance Committee (portion) 1661 – Compliance (portion) 1662 – Data Quality Group (portion)

APPENDIX 4, ATTACHMENT A: Functionalization of Activity Groupings for ISO Rate Structure (SUBJECT TO CHANGE)

Function	Sub-Function	Direct Personnel	Activities within proposed Grouping	Indicative Cost Centers (There is some overlap among cost centers)
Market Services	Market Usage	Market Operations Manager of Markets Market Quality (portion) Market Eng (portion) Business Solution (portion) Market Integration (portion) Markets & Scheduling Group (portion) Market Monitoring & Compliance FTR Auctions	Perform weekly, daily and hourly load forecasting Operate A/S and Real-Time markets Determine market clearing prices (A/S and Energy) Mitigate bids (real time and forward) Maintenance of market information postings (transmission/market OASIS) Operate unit commitment service under SMD Mitigate market power in Day-Ahead, Hour-Ahead and Real Time markets Develop and manage demand response participation Administer FTRs: • Perform FTR auctions (Primary) • Coordinate FTR bilateral trading (Secondary) • Calculate and determine feasibility of FTR capacity	1752 – Manager of Markets 1753 – Market Application and Testing 1757 – Market Integration 1756 – Market Quality (portion)
Market Services	Market Usage	Marketing monitoring and compliance	Monitor and report on market performance Investigate and report on potential gaming and market abuses Perform special studies on market efficiency, bidding behavior Develop new market rules or changes to market rules in response to market behavior Prepare and provide reports to regulatory authorities Implement and calculate penalties and sanctions for noncompliance	1641 – Market Analysis (portion) 1642 – Market Surveillance Committee (portion) 1661 – Compliance (portion) 1662 – Data Quality Group (portion)

APPENDIX 4, ATTACHMENT A: Functionalization of Activity Groupings for ISO Rate Structure (SUBJECT TO CHANGE)

Function	Sub-Function	Direct Personnel	Activities within proposed Grouping	Indicative Cost Centers (There is some overlap among cost centers)
Settlements, Metering and Client Relations		Settlements, Billing, Credit Administration and Metering	Determine charges associated with: • Transmission services • Day-Ahead schedules and markets (A/S and Energy) • Hour-Ahead schedules and markets (A/S and Energy) • Real time balancing energy market • Congestion management • Administrative charges, including the Grid Management Charge Manage settlement data Manage ETC manual settlements Prepare market and GMC invoices Prepare special invoices for FERC fees, interest, etc. Perform settlement statement reruns Market/settlements design and settlements training Dispute resolution, GFN, arbitration and monitoring Credit and collateral management • Manage collections and payments • SC financial security analysis Determination of losses and allocation Metering and data management • Collect and validate data from ISO polled meters • Repository of data polled from ISO polled meters and data submitted by SCs • Responsible for site inspection of metering sites • Responsible for setting up RIG data bases and submitting data into EMS • Push data to Settlement databases Manage Participating Intermittent Resources settlements	1722 – Business Development Support 1723 – Tariff and contract implementation 1724 – BBS-PSS 1725 – BBS-FSS 1462 – Field Data Acquisition (portion) 1321 - Accounting 1756 – Market Quality (portion)

APPENDIX 4, ATTACHMENT A: Functionalization of Activity Groupings for ISO Rate Structure (SUBJECT TO CHANGE)

Function	Sub-Function	Direct Personnel	Activities within proposed Grouping	Indicative Cost Centers (There is some overlap among cost centers)
Settlements, Metering and Client Relations		Account Management Services and Training	Provide ISO Tariff, Systems, Market and Settlements guidance to market participants Communicate scheduled events to market participants Communicate Market information Develop training curriculum Provide training to Market Participants (Settlements, System Infrastructure, Market Design) Facilitate stakeholder process Facilitate resolution of Market Participant issues	1741 – Client Relations
Settlements, Metering and Client Relations		ISO contract administration	Administer ISO contracts (non-vendor, e.g., RMR, PTO, MSS) Negotiate, manage, litigate contracts	1731 – Contracts and Special Projects (portion)
		Administrative and General (not directly assigned elsewhere	CEO Finance and Accounting Legal HR Regulatory policy and affairs Information services Strategic development Communications	1111 – CEO 1651 – Board of Governors 1241 – MD02 (currently) 1300 – Finance indirects 1400 – Information Services indirects 1600 – Legal and Regulatory indirects 1700 – Market Services indirects 1800 – Corporate and Strategic Development indirects
All	All	Startup costs	Recover costs associated with Startup	

Attachment A
Listing of Direct Assignment Cost Centers

Cost Center	Name
1462	Field Data Acquisition Systems
1467	Settlement Systems Services
1521	Grid Planning
1542	Outage Coordination
1543	Loads and Resources
1544	Real-time Scheduling
1545	Grid Operations
1546	Reliability Coordinators
1547	Engineering and Maintenance - General
1548	OSAT General
1549	Operations Training
1554	Special Projects Engineering
1555	Operations Support
1558	Transmission Maintenance
1559	Operations Applications Support
1561	Operations Engineering South
1562	Operations Engineering North
1563	Operations Coordination
1564	Scheduling Department Director
1565	Scheduling Support
1566	Regional Coordination
1641	Market Analysis
1642	Market Surveillance Committee
1661	Compliance - General
1662	Compliance - Audits
1722	~~Application~~ Business Development Support
1723	Tariff and Contract Implementation
1724	BBS Settlements - Preliminary Settlements
1725	BBS Settlements - Final Settlements
1731	Contracts & Special Projects
1741	Client Relations
1752	Manager, Markets
1753	Market Engineering
1755	Business Solutions
1756	Market Quality
1757	Market Integration

California ISO

Designated Receipent:
Nature of Data: Labor assignment templates for ISO GMC Rate Proposal
Dated: April 18, 2003
Date of Release: April 18, 2003

Disclaimer Regarding the Attached Data

purpose of furthering discussion and research in the ISO's '2004 Rate Structure Project'. The data, in the form attached, is provided in response to Stakeholders' requests and as such does not necessarily indicate the ISO's concurrence in, or support for, its usefulness in developing a rate methodology. No implications may be drawn regarding the ISO's position on any subject in the Project from either the inclusion or exclusion of any specific data. The ISO does not warrant the completeness or accuracy of the data.

Percentage Share of Direct Personnel by Subfunctions

	Cost Center	CRS Activities	ES&T Activities	Market Scheduling Activities	Congestion Management Activities	Market Usage Activities	Customer Service Activities	Total
1462	Field Data Acquisition Systems	20%	0%	0%	0%	0%	80%	100%
1521	Grid Planning	67%	33%	0%	0%	0%	0%	100%
1542	Outage Coordination	67%	33%	0%	0%	0%	0%	100%
1543	Loads and Resources	43%	57%	0%	0%	0%	0%	100%
1544	Real-time Scheduling	62%	38%	0%	0%	0%	0%	100%
1545	Grid Operations	67%	33%	0%	0%	0%	0%	100%
1546	Reliability Coordinators	100%	0%	0%	0%	0%	0%	100%
1547	Engineering and Maintenance - General	67%	33%	0%	0%	0%	0%	100%
1548	OSAT General	100%	0%	0%	0%	0%	0%	100%
1549	Operations Training	56%	44%	0%	0%	0%	0%	100%
1554	Special Projects Engineering	50%	50%	0%	0%	0%	0%	100%
1555	Operations Support	56%	44%	0%	0%	0%	0%	100%
1558	Transmission Maintenance	40%	60%	0%	0%	0%	0%	100%
1559	Operations Applications Support	67%	33%	0%	0%	0%	0%	100%
1561	Operations Engineering South	63%	38%	0%	0%	0%	0%	100%
1562	Operations Engineering North	56%	44%	0%	0%	0%	0%	100%
1563	Operations Coordination	80%	20%	0%	0%	0%	0%	100%
1564	Scheduling Department Director	100%	0%	0%	0%	0%	0%	100%
1565	Scheduling Support	41%	59%	0%	0%	0%	0%	100%
1566	Regional Coordination	100%	0%	0%	0%	0%	0%	100%
1641	Market Analysis	0%	0%	0%	30%	70%	0%	100%
1642	Market Survelliance Committee	0%	0%	0%	50%	50%	0%	100%
1661	Compliance - General	30%	10%	40%	0%	20%	0%	100%
1662	Compliance - Audits	0%	0%	33%	0%	67%	0%	100%
1722	Application Support	0%	0%	0%	0%	0%	100%	100%
1723	Tariff and Contract Implementation	100%	0%	0%	0%	0%	0%	100%
1724	BBS Settlements - Preliminary Settlements	0%	0%	0%	0%	0%	100%	100%
1725	BBS Settlements - Final Settlements	0%	0%	0%	0%	0%	100%	100%
1731	Contracts & Special Projects	50%	0%	0%	0%	0%	50%	100%
1741	Client Relations	0%	0%	0%	0%	0%	100%	100%
1752	Manager, Markets	17%	6%	33%	11%	28%	6%	100%
1753	Market Engineering	11%	0%	33%	11%	33%	11%	100%
1755	Business Solutions	8%	0%	50%	0%	33%	8%	100%
1756	Market Quality	0%	0%	0%	0%	67%	33%	100%
1757	Market Integration	10%	0%	40%	0%	40%	10%	100%
	Total Direct Personnel	**42%**	**23%**	**5%**	**2%**	**10%**	**19%**	**100%**

This data is subject always to the Disclaimer issued by the ISO at the time of its distribution.

Breakdown of Direct Personnel by Subfunctions

	Cost Center	CRS Activities	ES&T Activities	Market Scheduling Activities	Congestion Management Activities	Market Usage Activities	Customer Service Activities	Total
1462	Field Data Acquisition Systems	3	0	0	0	0	12	15
1521	Grid Planning	10	5					15
1542	Outage Coordination	8	4					12
1543	Loads and Resources	3	4					7
1544	Real-time Scheduling	13	8					21
1545	Grid Operations	34	17					51
1546	Reliability Coordinators	8	0					8
1547	Engineering and Maintenance - General	2	1					3
1548	OSAT General	2	0					2
1549	Operations Training	10	8					18
1554	Special Projects Engineering	2	2					4
1555	Operations Support	5	4					9
1558	Transmission Maintenance	4	6					10
1559	Operations Applications Support	4	2					6
1561	Operations Engineering South	5	3					8
1562	Operations Engineering North	5	4					9
1563	Operations Coordination	4	1					5
1564	Scheduling Department Director	1	0					1
1565	Scheduling Support	9	13					22
1566	Regional Coordination	3	0					3
1641	Market Analysis	0	0	0	3	7	0	10
1642	Market Survelliance Committee	0	0	0	2.5	2.5	0	5
1661	Compliance - General	3	1	4	0	2	0	10
1662	Compliance - Audits	0	0	1	0	2	0	3
1722	Application Support	0	0	0	0	0	5	5
1723	Tariff and Contract Implementation	6	0	0	0	0	0	6
1724	BBS Settlements - Preliminary Settlements	0	0	0	0	0	10	10
1725	BBS Settlements - Final Settlements	0	0	0	0	0	9	9
1731	Contracts & Special Projects	5	0	0	0	0	5	10
1741	Client Relations	0	0	0	0	0	20	20
1752	Manager, Markets	3	1	6	2	5	1	18

1753	Market Engineering	1	0	3	1	3	1	9
1755	Business Solutions	0.5	0	3	0	2	0.5	6
1756	Market Quality	0	0	0	0	10	5	15
1757	Market Integration	0.5	0	2	0	2	0.5	5
		154	84	19	8.5	35.5	69	370
								370

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Breakdown of MS and Others Between Sch, MU, CONG, CRS and CS

	Cost Center	CRS Activities	ES&T Activities	Market Scheduling Activities	Congestion Management Activities	Market Usage Activities	Customer Service Activities	Total	Check
1462	Field Data Acquisition Systems	3					12	15	15
1722	Application Support						5	5	5
1723	Tariff and Contract Implementation	6						6	0
1724	BBS Settlements - Preliminary Settlements						10	10	10
1725	BBS Settlements - Final Settlements						9	9	9
1731	Contracts & Special Projects	5					5	10	10
1741	Client Relations						20	20	20
1752	Manager, Markets	3	1	6	2	5	1	18	18
1753	Market Engineering	1		3	1	3	1	9	9
1755	Business Solutions	0.5		3	0	2	0.5	6	6
1756	Market Quality					10	5	15	15
1757	Market Integration	0.5		2		2	0.5	5	5
1641	Market Analysis	0	0	0	3	7	0	10	10
1642	Market Surveillance Committee	0	0	0	2.5	2.5	0	5	5
1661	Compliance - General	3	1	4		2		10	10
1662	Compliance - Audits			1		2		3	3
		22	2	19	8.5	35.5	69	156	
								156	

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Breakdown of CAS Between CRS and E&TS

	Cost Center	Core Activities	Scalable Activities	Total
1521	Grid Planning	10	5	15
1542	Outage Coordination	8	4	12
1543	Loads and Resources	3	4	7
1544	Real-time Scheduling	13	8	21
1545	Grid Operations - Generation Dispatcher	10	7	17
1545	Grid Operations - Transmission Dispatcher	15	7	22
1545	Grid Operations - Management & Support	9	3	12
1545	Grid Operations	34	17	51
1546	Reliability Coordinators	8	0	8
1547	Engineering and Maintenance - General	2	1	3
1548	OSAT General	2	0	2
1549	Operations Training	10	8	18
1554	Special Projects Engineering	2	2	4
1555	Operations Support	5	4	9
1558	Transmission Maintenance	4	6	10
1559	Operations Applications Support	4	2	6
1561	Operations Engineering South	5	3	8
1562	Operations Engineering North	5	4	9
1563	Operations Coordination	4	1	5
1564	Scheduling Department Director	1	0	1
1565	Scheduling Support	9	13	22
1566	Regional Coordination	3	0	3
		166	99	265
				265

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Attribution of Activity by Cost Center
Market Services Activities vs. Other Activities
Development of CAISO Rate Structure Proposal

For Cost Center: Field Data Acquisition Systems 1462

	Core Reliability Services Activities	y and Transmission Services Activities - Sc	Scheduling Services Activities	Congestion Management Activities
Description of Activities	Support the Remote Intelligent Gateway ("RIG") interface system in the daily operation of power generation, scheduling, and control of the ISO Controlled Grid. The Automatic Generation Control (AGC) system simultaneously controls Generating Unit output to match resources to load and maintain frequency. Generating Units offering regulation services must be capable of being controlled by the ISO EMS. RIG interface units meet the ISO standards for transporting AGC signals. The ISO has the ability to send either set point or raise/lower signals.			
# of People	3			
Justification	Controlling generation under AGC is a core activity of the Control Area. It is essential to the real time balancing of load and resources. Without this activity, security of the transmission grid is compromised.			

completed by: B. Arikawa
Date: 4-Apr-03

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Market Usage Activities	Customer Service Activities
	Collection, verification and processing of raw meter data into Settlement Quality Meter Data (SQMD), which the ISO uses for generating preliminary and final financial settlement statements for the Market Participants, Market Surveillance and reports. Auditing the ISO meter inspection process and providing engineering judgment related to proposed and existing metering systems. Operating and maintaining Meter Data Acquisition Systems ("MDAS") that directly acquires metering data from ISO metered entities and receives metering data from SCs. Auditing metering data collection, storage and processing systems of the SCs. Maintaining the metering standards and specifications for approved meters and metering systems. Coordinating and approving proposed metering system-engineering designs.
	12
	Meter Data Acquisition Systems (MDAS) activities are directly related to acquiring data for the Settlements system and maintaining and monitoring meter data systems. These activities are essential to the functioning of Settlements systems as they provide the data without which billing units could not be calculated.

Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1521
Grid Planning

	Core Activities	Scalable Activities
Description of Activities	1)PTO's expansion plans: FERC expects that the ISO will review all PTOs expansion plans and determines which ones are really needed. 2) RMR determinations: We make the decision on where we have local reliability criteria violations as part of the RMR process 3)Regional/National work on Planning Issues: We are heavily involved in providing input and do work for NERC, WECC, SSG-WI, San Francisco and other groups 4) Generator Interconnection Studies: We make studies to detemine that grid reliability is not affected when a new generator is interconnected.	These are additional activities to address transmission planning, generator interconnection, and RMR as a result of the ISO being a large control area with substantial load growth.
# of People	10	5
Justification	Any proposed transmission additions will have a direct impact on the functioning of the grid. The ISO has to have the capability to ensure that the transmission additions are incorporated in a manner that maintains and/or enhances the reliability of the grid. The ISO has to consider what RMR is required to maintain local area reliability. Every control area within a regional reliability coordination council has to do planning to ensure that all of the control areas together meet the council's requirements for reliability.	Because the control area load is growing there is a lot of generation and transmission planning and development going on and more complex RMR studies are required. So additional people are needed to staff these activities.

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completed by: A. Perez
Date: 24-Mar-03

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Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1542
Outage Coordination

	Core Activities	Scalable Activities
Description of Activities	Coordination of planned transmission and generation outages to ensure resource needs and grid reliability are met. Includes integration of long range planning and immediate outages needs. Performs generator inspections to ensure no gaming is occurring. Prepares reports and interfaces with the California Energy Facilities Standards Committee for coordinated operations of generator maintenance. Meets with PTO staff to coordinate difficult outages. Coordinates and posts transmission path ratings for the OASIS as well as path ratings for use by the Scheduling Department to determine ETCs and NFU for the DA markets	Activities are the same as the core activities except the complexity increases due to cancellations due to loads and resource problems, as well as increasing grid facilities through construction.
# of People	6 outage coordinators, 1 administrative assistant, and 1 manager for a total of 8 FTEs	4 additional outage Coordinators, total of 4 FTEs
	8	4
Justification	These numbers assume all outages were completed as planned, very little engineering studies required, if PTOs and generators communicated effectively, and unplanned outages did not occur to major facilities. 1 forward OC, 1 generator OC, 4 transmission OCs, and 1 administrative assistant for reporting and filings. The transmssion system maintenance requirements are not generally effectived by heavy or light loading, so maintenace on equipment is required on a periodic basis regardless of loading. Generator outages in most cases are more critical then transmission becasue sufficient units must available to meet system requirements. So clsoe attention to generator outages is required. The ISO involvment with the California Energy Facilities Standards Committee is mandated by state law, as well as FERC rules for OASIS and seperation of transmission and generator functions, and WECC rules for coordinating outages are all mandated rules.	Because the system is so dynamic, planned outages are often cancelled and must be rescheduled. Unforeseen forced outages many times cause other planned outages to be deferred. This is more realistic of what Outage Coordination deals with on a day to day basis. Additionally, generator units become restricted or forced out and must be rescheduled around other generator units and transmission lines. The core activities FTEs does not take into account vacations, sick time, training needs. These additional Outage Coordinators are used for that purpose too.

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completed by: Tracy R. Bibb
Date: 27-Feb-03

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Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1543
Loads and Resources

	Core Activities	Scalable Activities	
Description of Activities	1. Preparing control area and local area load and resource adequacy assessments; publish CAISO Summer and Winter Assessment Reports.		
	2. Support for EMS/Advanced Application.	2. Supporting EMS Advance Applications based on the number of systems changes and need for tool enhancement. (1FTE)	
		3. Engineering support for environmental issues impacting control area resources; based on number of generating units that have potential environmental limitations. Providing support for Existing Contract, MSS and System Units, and other Scheduling issues; Providing engineering support for ISO contracts issues (e.g., RMR contract, Participating Generator Agreement ("PGA"), etc.) (2 FTEs)	
		4. Manager required based on number of employees.	
# of People	**3**	**4**	**7**
Justification	1. NERC/WECC require seasonal and periodic evaluation of load and generation forecast. CEC/CPA require active participation in development and support of resource estimates. 2. EMS/Advanced Applications require ongoing support and updating of models and data included in the various tools. These tools are a part of our EMS system and are required in MD02.		
completed by: **Date:**			

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Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1544 Real-time Scheduling

	Core Activities	Scalable Activities
Description of Activities	Many activities of real-time intertie scheduling is dictated by NERC and WECC rules and existing transmission contracts. They include: hourly tie checkouts for actual and scheduled energy, validation of E-tagging of schedules, scheduling of both planned	All the activities listed for core except increased volumes with the exception of branchgroup hourly checkouts.
# of People	total of 2 schedulers per shift (1 Alhambra and 1 Folsom) or 10 FTEs, 1 lead real-time scheduler and 1 manager for a total of 13 FTEs.	1 additional scheduler per shift at Folsom, plus 3 additional schedulers at Alhambra to supplement the 1 scheduling desk during periods of high activities or 8 additional FTEs.
	13	8
Justification	The ISO has 30 different branchgroups that it schedules across. Schedules on all these branchgroups must be checked hourly as well as the actual power flows and E-tags associated with the schedules, this averages between 460 to 700 per day. Tie ratings usually change due to contingencies. However some tie ratings change with generation requirements and/or system loads. This can be both internal and external to the ISO system. Regardless, it must be dealt with per WECC, NERC and ISO rules. Additionally, atleast one scheduler must be at each facility for control back-up requirements.	During periods of heavy peak load and off peak over generation the scheduling activities increase. Additionally, checkouts with adjacent control areas become timely when numbers do not match (WECC and NERC require checkouts to agree prior to beginning schedules). Also, do to computer failures, all the activities listed must be done by hand work arounds and the data bases updated once they become operational again. During periods of some contingencies the work load can double or triple easily. These also take into account coverage for vacations, sick time and training.

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completed by: Tracy R. Bibb
Date: 27-Feb-03

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Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1545
Grid Operations - Generation Dispatcher

	Core Activities	Scalable Activities
Description of Activities	Monitors the day to day functions as required to maintain stability and reliability of the electrical system under the ISO. Operates to meet all interie obligations, emergencies and WECC and NERC requirements. Dispatches energy within Operating procedure guidelines to maintain proper Area Control Error and scheduled frequency. Forecasts future electricity needs, plans to meet these needs and procures energy necessary to meet this obligation. Exercises independent judgment during emergency conditions.	Activities are exact as Core, except that an additional person is needed per shift (5) to keep up with monitoring of generators, logging, system emergencies and line mitigation. An additional 2 people are used on days for support, new projects, training and shift coverage during vacations and sick days.
# of People	10	7
Justification	This amount of personnel would be the minimum required to meet the daily real-time functions and assumes that everything operates without SC troubles, Generator compliance issues or a major system disturbance. The above amount is made up of 5 Real-time Generation Dispatchers in Folsom and 5 in Alhambra. One is needed in each location per shift (5 shifts)	With a system as dynamic, complex and large as the ISO's, extra people are needed to maintain system reliability and to meet WECC and NERC requirements. The ISO is in such a state of flux that people are required for many functions other that what is listed on their job description. These would include MD02, NSLIC, computer system upgrades and training on all of the same subjects.

completed by: Larry Bellnap
Date: 7-Mar-03

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Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1545
Grid Operations - Transmission Dispatcher

	Core Activities	Scalable Activities
Description of Activities	Directs transmission grid operations according to ISO procedures and WECC and NERC guidelines under both normal and emergency conditions. Controls the transmission system and monitors transmission lines and voltages. Maintains communication with all PTO's and Control Areas to coordinate all switching and outages for reliable system operation. Implements all ETC rights. Works with other ISO personnel (OE, Generation, MO and Scheduling) during line overloads to mitigate congested conditions. Maintains accurate logs of all recordable events.	Activities are same as Core, except that an additional person is needed per shift (5) to keep up with system monitoring (line loading, voltages, outages, etc). It is necessary to have an additional person on shift to keep up with the large volume of logging, emergency events, communications with other dispatchers in the ISO control room, with the PTO's and other Control Areas. There is also an additional 2 people - 1 in Ahambra and 1 in Folsom on straight days to cover training, sick leave usage, map board maintenance and projects.
# of People	15	7
Justification	The break down of this position is - 2 positions in Folsom and 1position in Alhambra per shift (5 shifts). This assumes that there would be minimal work load and that system emergencies would occur on a very limited basis. Logging, outages (planned and forced), congestion overload and voltage requirements would all function at a level much below what is routinely experienced.	With a system as dynamic, complex and large as the ISO's, extra people are needed to maintain system reliability and to meet WECC and NERC requirements. The ISO is in such a state of flux that people are required for many functions other that what is listed on their job description. These would include MD02, NSLIC, computer system upgrades and training on all of the same subjects.

completed by: Larry Bellnap
Date: 7-Mar-03

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Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1545
Grid Operations - Management & Support

	Core Activities	Scalable Activities
Description of Activities	Management: Duties range from the overall success of ISO Grid Operations to managing facilities. Grid Operations management is responsible for the operation of the ISO in a safe and reliable manner within ISO operating procedures and in compliance with NERC policies and WECC criteria. They act as liaison between real-time shift personnel and other ISO managers and departments. Works with all other Control Areas, SCs, PTOs and Market participants. Support: Duties include administrative work, travel scheduling, meeting minutes, scheduling meetings and conferences, order of office supplies and in general keeps the Grid Operations floor running in an efficient manner. They also track budget and other fiscal expenditures and make reports indicating such. Verify vacation usage, expense reports and other duties as necessary.	Management: Activities are same as Core, except that 2 additional persons are needed as support on dayshift to cover additional work load created by projects, training, and system emergencies. Also committees participation within NERC and WECC add an additional work load to directors and managers within Grid Operations and require extra support. Support: Duties would remain the same only the extra person would be responsible for the increase work load created by projects and emergency situations.
# of People	9	3
Justification	Management: This includes 1 Director, 1 Alhambra manager and 5 Shift Managers. This is the absolute minimum required to meet day to day operations and would not include extra work load created by additional meetings, travel, training and projects. Additional help would be required during times of higher workload such as to operate the system in a significantly abnormal condition or configuration and for emergency events. Support: Positions include 1 Administrative Assistant to the Director of Grid Operations and 1 Operations Analyst. Work load would be heavy and in states of emergency and abnormalities, some work would not be done in a timely manner.	Management: With the ever changing complexity of the ISO, additional people are required to make sure that ISO Grid Operations is represented to the standards needed to ensure a reliable and safely operated control area and meet the requirements of all ISO Operating procedures, NERC policies and WECC criteria. Support: Due to the complexity of the work in Grid Operations, extra Administrative support is needed to keep up with the daily work generated by this complexity. This would include, listening to tapes, report and data gathering, databases, paperwork and building and maintaining tracking tools, reports,etc.

completed by: Larry Bellnap
Date: 7-Mar-03

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Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1546
Reliability Coordinators

	Core Activities	Scalable Activities
Description of Activities	Reliability Coordination for Calif.-Mexico Subregion - one of three Reliability Coordination Centers for the Western Interconnection	
# of People	8	
Justification	NERC and WECC Requirement - the majority of expenses associated with this function are reimbursed by WECC	

8

completed by: D. Hawkins
Date: 1-Mar-03

This data is subject always to E. R. Riley
DATE: 3-Mar-03

Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1547
Engineering and Maintenance - General

	Core Activities	Scalable Activities	
Description of Activities	1. Provides guidance direction of OE&M. Includes technical direction on engineering issues and solutions including activities in engineering, maintenance, loads and forecasting; supports numerous corporate issues. 2. Same as core. Scalable based on the number of department employees supported. (1FTE) 3. Provides office support for typing, filing, scheduling meetings, taking meeting minutes, scheduling travel arrangements and general office support.		
# of People	**2**	**1**	**3**
Justification	1. Required work to support shift personnel with technical tools and engineering solutions.		

completed by:
Date:

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Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1548
OSAT General

	Core Activities	Scalable Activities
Description of Activities	Manages the entire OSAT department and budget. Managers of Operations Support, Training, Coordination and Applications Support report to the department director. The department responsibilities include: overseeing preparation and administration of training across all operations groups, other groups in the ISO, and Market Participants; providing support for ISO efforts to interface with and incorporate markets and deregulation from an operations perspective as they develop inside and outside the ISO; updating, creating and maintaining all ISO Operating Procedures, Contingency Procedures and the Business Continuity Plan; implementing Emergency Response programs and procedures within the ISO and in coordination with state and federal external agencies; and providing final operations approval of revised and newly developed EMS Displays as required and requested by Control Room personnel. OSAT provides training and support to all groups within the Grid Operations Division, to other departments within the ISO (particularly Market Operations) and to Market Participants to ensure and enhance system reliabilit workably competitive markets.	N/A
# of People	2	0
Justification	The staffing level above reflects the director of OSAT and one Administrative Assistant, who supports the director and provides secondary and backup support for all other OSAT business units. OSAT provides support to all departments within the Grid Operations Division, including the development of training programs, real-time operations support, development of procedures and tools for operations, and coordination of internal and external activities impacting operations. All aspects of support and training provided by this group facilitate safe and reliable operation of the CAISO control area, CAISO control area obligation to the Western Interconnection, and compliance with NERC and WECC standards and policies.	N/A

2

completed by: Deane Lyon
Date: 02-Mar-03

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Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1549
Operations Training

	Core Activities	Scalable Activities
Description of Activities	Preparing and managing the training budget; Manage the activities of the staff responsible for development and delivery of Operations Training, the Operator-In-Training Program (OITP), the Continuous Learning Program and the Grid Operations Training Simulator (GOTS); Assure appropriate material and processes are created to accomplish training for Grid and Market Operations and other ISO groups; Manage support functions to assure training on procedures, tools and other training needs are met for all operations groups, other ISO departments, and external entities; Managing vendor relationships and maintaining accountability for work performed. The department requires considerable administrative support in order to meet the needs of the ISO; therefore one Administrative Assistant has been included in this section.	Control room Job/Task Analysis; Support for the Learning Management System or its successor system; Training development and administration support for the MD02 and SLIC projects; Plant Information (PI) system training; Operations Training Advisory Committee facilitation and management; Represent the ISO in WECC, NERC and other industry related training and personnel management forums as required; Outreach Program.
# of People	10	8
Justification	The Operations Training group is responsible for identifying, creating, developing, facilitating and delivering appropriate training material for Grid Operations, Market Operations, Scheduling, and other ISO groups. The provision of this training and associated activities is essential to the core function of the CAISO, which is to reliably and safely operate the CAISO control area, meet the control area obligation to the Western Interconnection and comply with WECC and NERC standards and policies; Due to ongoing changes in the industry and the high turnover rate of System Operators, there is a need to maintain the OIT Program, which requires recruiting, testing and hiring, creation and maintenance of training modules; use of an off-site simulator and pertinent field visits; Procurement and implementation of necessary hardware and software to accomplish this training; Monitor the activities of various groups, including Operations Support, Operations Engineering, Grid and Market Operations personnel, NERC & WECC to support various operations training needs including procedures, reports, EMS	Note: The above staffing number includes 5 additional Operator-In-Training (OIT) positions not included in the "Core Activities" section. The JTA project started in 2001, and the maintenance phase began in 2002. Maintenance consists of adding processes/positions as they occur, updating the existing processes and all corresponding information as processes change based on evolvement of the Energy Management System (EMS) and maintenance of the Course Plan, Module Development, and the Skill/Knowledge Gap Analysis. PI, a historical data information retention and management system, is nearly as essential as the EMS. Demand for additional PI training indicates the need to continue it. The Outreach program is designed to educate interested internal and external parties who are non-operations oriented on the basic operations of the ISO.

completed by: Deane Lyon
Date: 01-Mar-03

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Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1554
Special Projects Engineering

	Core Activities	Scalable Activities
Description of Activities	Special Projects Engineering provides special reports to FERC, NERC and WECC on Control Area Operations. The primary role of Special Project Engineering is to provide Operations personnel with the best technology, tools and advanced applications that solve operating problems, improve grid reliability and facilitate the accurate and timely reporting to various regional reliability organizations and government agencies.	Number of operating issues to be analyzed, number of transmission maps to maintain, number of DG and Intermittent Resources in the control area.
# of People	2	2
Justification	Specific roles and responsibilities include: Analysis of Operating Problems, Wind Generation forecasting tools, Creation of Transmission Maps, Coordination of R&D programs, Participating in NERC and WECC Committees and working groups; and development of control practices for Wind Generation and Distributed Generation	As the size of the control area varies, the number of maps to be maintained changes. As the amount of transmission, generation, intermittent resources and DG in the control area varies, the amount of people required to track and analyze these resources vary.

completed by: David Hawkins
Date: 1-Mar-03

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REVIEWED BY: E. R. Riley
DATE: 3-Mar-03

Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1555
Operations Support

	Core Activities	Scalable Activities
Description of Activities	Business Unit Management; Operating Procedure Program Management; Emergency Management; RMR and general PGA Unit Ancillary Service and PMax Testing and Certification; Contingency Procedure and Business Continuity Plan Management; Engineering Support, including Interconnected Control Area, UDC, PTO and Dynamics agreement research, development and implementation; RMS and NERC/WECC Compliance Tracking and Reporting; New Resource Interconnection (NRI) Committee representation	Grid and Market Operations drill and exercise coordination and management; EOC activation and management; TEMS maintenance; Emergency contact maintenance; OSAT budget analysis and tracking; NRI Team representation; Daily Operations Report; Critical Event Recorder; Representing the ISO on various committees and managing communication with external agencies, including SWEPC, CESA, FEMA, CUEA, OES; Technichal Writing support; Public and Market Participant outreach; Special projects managment and participation
# of People	5	4
Justification	The Operations Support Group is responsible for supporting the various Grid and Market Operations needs of the ISO Real Time operations control room and the Grid and Market Operations Divisions, which are essential for reliable interconnected system operations. Included in these core support functions are emergency preparedness and response coordination and communications and Emergency event notification, internally and to variety of state and federal agencies (collectively known as ERC duties); interconnected control area, UDC, PTO and MSS agreement development and implementation; The NRI Committee manages the interconnection of new generating units and transmission lines within the CAISO control area; Generating Unit Ancillary Services, RMR and Pmax testing and certification is required to determine unit response capability and capacity; Managing the development, creation, maintenance, tracking and internal/external distribution of operating procedures; Mandatory reporting functions, including WECC RMS data collection and reporting; Development and maintenance of Business Continuity Plan and Business recovery and contingency procedures.	Drills and exercises prepare control room personnel and the Emergency Response Team for system emergency manangement and communication. The Transmission Emergency Management System, or TEMS, helps to facilitate the tracking and non-vocal communication and coordination of grid emergency management and response. Represent the ISO in WECC, NERC and other forums as required; Identifying and managing changes in the tariff, protocols, and market design that would improve market and grid operations; State and federal agency and intra-control area entity communications interdependency support; Technical writing support for Grid and Market Operations, and other CAISO departments as necessary and as available.

completed by: Deane Lyon
Date: 01-Mar-03

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Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1558
Transmission Maintenance

	Core Activities	Scalable Activities	
Description of Activities	1. Manages the filling, updating, and auditing associated with the PTO's filled maintenance standards. Includes review of the forced outages and trends.	1. Same as core, but scalable based on the number of outages and performance trends (1 FTE) and number of protection related problems. (1 FTE).	
	2. Develop, maintain and manage the Transmission Register.		
	3. Oversee, track, and manage new generation connections and PTO capacity projects.	3. Same as core, but sclable based on number of new conections and PTO projects (2 FTEs and contractors).	
		4. Manager required based on the number of employees. (1FTE).	
# of People	**4**	**6**	**10**
Justification	1. Required by AB1890, ISO Tariff, and TCA. 2. Same as above. 3. Required by TCA, ISO Tariff, and AB 970.		

completed by:
Date:

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Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1559
Operations Applications Support

	Core Activities	Scalable Activities	
Description of Activities	Manage the budget and daily activities of the Operations Applications Support department. Provide applications support to Grid Operations, Scheduling, Security Coordination, Engineering and Maintenance, and Market Operations personnel. It has assumed end user support responsibility for many new and existing applications, including the RMS database, Operations Event Tracker, Generation Ramp Planning Tool, EMS Network Applications, Today's Outlook web page, Pro Rata Application, Hourly Load Log, FRR tracking & reporting, resolution of EMS Display/Data presentation issues, SLIC Redesign II Project Management, implementation, MD02 requirements and creation of SLIC-to-Outage Scheduler conversion database, Transmission Registry redesign support, and response to data requests for information from EMS, PI, SLIC, and other applications.	Support and further development of the Operations High Track Application, which tracks high-profile Grid Operations issues and processes and includes Grid Operations division metrics data; Development of web-based applications and, in particular, conversion of exisitng stand-alone and network applications to web-based applications. Provide coordination of Operations Systems and ISO business units to direct the acquisition of new systems and applications to meet end user requirements; Actively seek the replacement of existing systems as necessary by providing specifications for RFP's and bid proposals to implement changes to development, test and production environments; Coordinate the development of specifications and bids for the procurement of new, and provide improvements or modifications to existing systems and applications.	
# of People	4	2	6
Justification	Current staffing level is necessary to provide development, enhancement and support of specialized applications and systems designed to improve the efficiency and effectiveness of ISO real-time operations. This includes communication with other business units to insure that the Operations Systems group can maintain the support and functionality of existing processes and changes to interconnected systems; During project implementation, develop levels of expertise for Operations Applications support staff and assure vendor compliance to project design specifications; Develop standards and procedures for the testing of delivered products to assure they meet all requirements of the original specifications; Provide improvements or modifications to existing systems and applications to support end user requirements through project design, product development, and coordination of comprehensive testing of deliverables to assure all requirements of the original specifications have been followed; Coordinate project transition from factory development and testing to a production environment, develop general system information for all ISO personnel and delivery of all applicable manuals; Adhere to ISO change and configuration management policies and procedures.	The workload in this department has increased beyond its current capacity to perform its daily requirements. The two additional "scalable" staff are currently established as contract positions, and are, in fact, necessary to support core activities as described. It is antcipated that the current contract positions will be converted to FTE positions as budget and overall ISO staffing levels allow.	

completed by: Deane Lyon
Date: 01-Mar-03

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Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1561 Operations Engineering South

	Core Activities	Scalable Activities	
Description of Activities	1. Southern Area Operations Engineering is responsible for the technical support of the southern portions of the area operation and the entire Bulk (500kV) system operations	Provide backup and support for bulk work. (1FTE)	
	2. Conduct seasonal operating studies, establish seasonal OTCs 3. Develop/maintain/update ISO operating procedures. 4. Support Outage Coordination in the analysis of Transmission and Generation clearances 5. Seasonal local area operating assessments (including proposing and managing short-term projects), 6. Support the Real Time Operation and provide on-call services 7. Review and provide input on PTOs transmission plans and projects. Review and provide input on new generation interconnection.	2-7 Scalable based on volume of clearances and the number of new generation projects (1FTE).	
		Provide engineering support for ISO contracts issues (e.g., RMR contract, Participating Generator Agreement ("PGA"), etc.). Participate in the Grid Planning process – LARS, Expansion Plans. Prepare disturbance reports for the bulk system and local areas. Participate in WECC working groups and related activities. (1FTE).	
# of People	**5**	**3**	**8**
Justification	1-7 Required functions in support of real time operations.		

completed by:
Date:

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Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1562 Operations Engineering North

	Core Activities	Scalable Activities	
Description of Activities	1. Conduct seasonal operating studies, establish seasonal OTCs . 2. Develop/maintain/update ISO operating procedures. 3. Support Outage Coordination in the analysis of Transmission and Generation clearances. 4. Seasonal local area operating assessments (including proposing and managing short-term projects). 5. Support the Real Time Operation and provide on-call services 6. Review and provide input on PTOs transmission plans and projects. Review and provide input on new generation interconnection.	1-6 Scalable based on volume of clearances and the number of new generation projects (1FTE).	
		Provide engineering support for ISO contracts issues (e.g., RMR contract, Participating Generator Agreement ("PGA"), etc.). Participate in the Grid Planning process -- LARS, Expansion Plans. Prepare disturbance reports for the bulk system and local areas. Participate in WECC working groups and related activities. (1FTE).	
# of People	**5**	**4**	**9**
Justification	1-6 Required functions in support of real time operations.		

completed by:
Date:

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Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1563
Operations Coordination

	Core Activities	Scalable Activities
Description of Activities	Manage the budget and daily activities of the Operations Coordination department. Responsible for overseeing the ISO interface activities with different outside entities and coordinating various internal and external activities and efforts that have an impact on real-time operations. Identify issues that impact efficient, reliable grid operations and develop enterprise wide solutions for the benefit of reliable Grid Operations and the CAISO. Coordinate Grid Operations responses on data requests resulting from various legal proceedings and investigations. Manages Grid Operations input and participation in the MD02 project. Provides primary Grid Operations input on Tariff changes, compliance with FERC rulings, and new or revised NERC and WECC policies and standards development. Provide Grid Operations liaison with internal departments including Operations Engineering, Market Operations, Market Quality, OSAT, Scheduling and Outage Coordination, Settlements, Legal & Regulatory, and Compliance. Coordinates and manages the annual operations audit required by the ISO tariff, as well as NERC and WE compliance audits.	The group has in the past managed projects resulting from legal proceedings, investigations, data requests, etc., requiring specialized grid and market operations data research and will continue to do so periodically. This, however, is not a Core Activity.
# of People	4	1
Justification	The primary objective of this group is to represent the interests and concerns of Grid Operations on legal, regulatory and policy matters and to ensure, working with the Legal and Regulatory Division, that Operations requirements are communicated to FERC, CPUC, EOB and CEC so that resulting changes do not negatively impact reliable grid operations. Without the efforts of this group, Grid Operations interests would be represented to a lesser degree and it is likely that key issues affecting them would be overlooked. The group also plays the key role for Grid Operations in MD02 development and implementation, providing expert input from the perspective of the division.	The group currently is staffed at the appropriate level for Core Activities, and employs one contract position for administrative support. This position could conceiveably be identified as scalable, but the group requires a significant amount of administrative support due to the scope and nature of its responsibilities, i.e., the numerous internal departments and external entities with which it interfaces on an ongoing basis.

completed by: Deane Lyon
Date: 01-Mar-03

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Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1564
Scheduling Department Director

	Core Activities	Scalable Activities
Description of Activities	Manages entire department. Ensures the ISO is represented at NERC, WECC, and other functions to ensure rules, lawa and regulations are adhered to as well as changes to these rules and regulations are coordinated. Works with other ISO departments, PTO, and SCs to ensure coordinated scheduling practices are in place. Responsible for all Scheduling Department personnel to adhere to rules, laws and regulations mandated by various agencies. Helps create corporate policy, and gives direction to accomplish them.	These core functions remain the same basically.
# of People	1 Director (1 FTE) The two administrative assistants account for previously in Outage Coordination and Scheduling support also serve as my assistants.	0 increase
	1	0
Justification	SEE ABOVE	Core functions remain the same regardless of the number of personnel. Although core functions stay the same, some increase in volume of time spent for personnel issues requires longer hours but not additional management.

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completed by: Tracy R. Bibb
Date: 27-Feb-03

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Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1565
Scheduling Support

	Core Activities	Scalable Activities
Description of Activities	Prescheduling energy on interties, Approving E-tags for schedules, Control Area checkouts, Calculation of ETCs for DA market. After-the-Fact Scheduling responsible for energy accounting checkouts with control Areas and SCs, inadvertent accounting and reports, Various other WECC and NERC reporting. (This assumes vacations, sick leave, training, etc will be covered by overtime)	All the activities listed under Core except with higher volumes and activities related to procedure, protocol, or tariff changes that require front end preparation for implementation.
# of People	4 preschedulers (two per shift, days only, 7 days a week) and 4 After-the-Fact staff and one administrative assistant is required for both Real-time Scheduling and Support for a total of 9 FTEs.	2 preschedulers (3 per shift, days only, 7 days a week) plus a lead prescheduler and 2 additional After-the-Fact staff, and 1 manager for the entire Scheduling Support Group. Total FTEs 13.
	9	13
Justification	The ISO has 30 different branchgroups that it schedules across. Preschedules on all these branchgroups must be checked as well as the E-tags associated with the schedules, this averages between 460 to 700 per day. ETCs must be calculated daily before the DA market runs. Failure to do so will result in ETC holders not receiving their entitlements. The ISO runs markets 7 days a week, so coverage is required. After-the-Fact personal check accounting with SCs and others. This practice is recognized by nearly all entities as a requirement (no change from pre-deregulation days). Reports to WECC and NERC from After-the-Fact are mandated by their rules.	After-the-Fact work load varies with activities that are tied to real-time and forward markets. So periods of high loads or over generation creates additional work. Contingencies(not included in core activities) create heavy work loads to balance accounts affected by the contingencies. The additional preschedulers are a direct result of increased schedules and E-tags for heavy load periods and programmed outages. With 12 total FTEs a manager is required for coordination of tasks, implementing new rules, participating in regional activities required by WECC and other agencies. these additonal FTEs are used for vacation, sick time and training coverage also to minimize premimum pay

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completed by: Tracy R. Bibb
Date: 27-Feb-03

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Attribution of Activity by Cost Center
Core Activities vs. Scalable Activities
Development of CAISO Rate Structure Proposal

For Cost Center: 1566
Regional Coordination

	Core Activities	Scalable Activities
Description of Activities	Coordinate representation and oficial positions of the CAISO at NERC, NAESB, WECC and ISO/RTO Council committees, subcommittees, work groups, task forces, and standards development efforts. Represent the CAISO on BAD, CSIC, and other Seams Working Groups	No scalable activities
# of People	3	0
Justification	The fact that CAISO is an ISO requires us to participate on these Regional and National committees and working groups that set the operating and business practices standards for the industry. FERC has ordered the CAISO to participate in western seams iss	

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completed by: D. Hawkins
Date: 1-Mar-03

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REVIEWED BY: E. R. Riley
3-Mar-03

Attribution of Activity by Cost Center
Market Services Activities vs. Other Activities
Development of CAISO Rate Structure Proposal

For Cost Center: Market Analysis 1641

	Core Reliability Services Activities	Energy and Transmission Services Activities - Scalable	Scheduling Services Activities
Description of Activities			
# of People			
Descripton of Positions			
Justification			

completed by: Keith Casey & Greg Cook
Date: 21-Mar-03

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Congestion Management Activities	Market Usage Activities	Customer Service Activities	
Evaluation of transmission capacity expansion Analyze market design and market rules to identify potential inefficiencies or oportunities for market power and gaming. Recomment changes to market design and market rules to enhance market efficiency.	Monitor market performance and market participant behavior. Design and develop market monitoring systems. Investigate specific market activity and behavior identified as potential gaming or manipulation.		
3	7		10
2 Principal Economists 1-Manager	5 - Principal Economists 2 - Managers		
Leads to more effective and efficeint market structures that result in fair and competitive outcomes.	Satisfys FERC requirment for monitoring market performance. Leads to more effective and efficeint market structures that result in fair and competitive outcomes.		

Attribution of Activity by Cost Center
Market Services Activities vs. Other Activities
Development of CAISO Rate Structure Proposal

For Cost Center: Market Surveillance Committee
1642

	Core Reliability Services Activities	Energy and Transmission Services Activities - Scalable
Description of Activities		
# of People		
Descripton of Positions		
Justification		

completed by: Keith Casey & Greg Cook
Date: 21-Mar-03

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Scheduling Services Activities	Congestion Management Activities	Market Usage Activities	Customer Service Activities
	Evaluation of transmission capacity expansion Analyze market design and market rules to identify potential inefficiencies or oportunities for market power and gaming. Recomment changes to market design and market rules to enhance market efficiency.	Monitor market performance and market participant behavior. Design and develop market monitoring systems. Investigate specific market activity and behavior identified as potential gaming or manipulation.	
	2.5	2.5	
	2-Market Surveillance Committee Members .5-DMA Liasion	2 - Market Surveillance Committee Members .5 - DMA Liaison	
	Leads to more effective and efficient market structures that result in fair and competitive outcomes.	Satisfys FERC requirment for monitoring market performance. Leads to more effective and efficeint market structures that result in fair and competitive outcomes.	

Attribution of Activity by Cost Center
Market Services Activities vs. Other Activities
Development of CAISO Rate Structure Proposal

For Cost Center: Compliance - General 1661

	Core Reliability Services	Energy and Transmission Services
Description of Activities	Monitor performance of Generating Units scheduled to provide Regulation; define Regulation performance metric; investigate non-compliance events identifed by Grid Operations and others; monitor compliance with the must-offer obligation; implement measures required to maintain balance energy in real time such as uninstructed deviation penalty; monitor and enforce compliance with operating orders; cost-effectively automate associated compliance measures.	[Same as core reliability services, increased intensity]
# of People	3	1
Justification	Delivery of reliability services and fulfillment of other obligaitons under the ISO Tariff is essential to reliable operations and responsible commerical operations (i.e., settlements).	Delivery of reliability services and fulfillment of other obligaitons under the ISO Tariff is essential to reliable operations and responsible commerical operations (i.e., settlements).

completed by: Eric Leuze
Date: 17-Mar-03

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Scheduling	Market Services
Monitor consistency of Ancillary Service schedules with certified ramp rates; assess need Ancillary Service certification process and need for changes; evaluate the need for unannounced testing of scheduled Ancillary Services, and design of other measures to assure that scheduled Ancillary Services are available and capable of performing; monitor scheduled and metered deviations by Metered Subsystems and determine penalties; cost-effectively automate rules and processes for investigation and enforcement; establish documentation of SAS 70 level of process and controls for compliance programs;	Assist in MD02 design and implementation (e.g., Market transaction System); develop special purpose protocols and rules as required (e.g., Participating Intermittent Resource Protocol); design and verify performance of demand programs; resolve disputes; support market investigations and respond to subpoenas; provide briefings on compliance matters and support legislative strategy; manage projects and people.
4	2
Delivery of reliability services and fulfillment of other obligaitons under the ISO Tariff is essential to reliable operations and responsible commerical operations (i.e., settlements).	Delivery of reliability services and fulfillment of other obligaitons under the ISO Tariff is essential to reliable operations and responsible commerical operations (i.e., settlements).

Attribution of Activity by Cost Center
Market Services Activities vs. Other Activities
Development of CAISO Rate Structure Proposal

For Cost Center: Compliance - Audits 1662

	Scheduling Services	Market Services
Description of Activities	Coordinate implementation of ISO information release element of ISO market investigation and enforcement program; develo	Oversee and provide quality assurance on Scheduling Coordinator self-audits, and prepare reports on best practices; monitor and correct UFE and under-reported Load; admnister late meter data program; coordinate Resource Registry changes and assist in Master File management; support SAS 70 Type 2 audit; assist in designing, performing data analysis and verifying demand programs; assist state agencies in planning and evaluating demand programs; assist in establishing new UDCs and in meter data issues for Metered Subsystems.
# of People	1	2
Justification	Fulfillment of obligaitons under the ISO Tariff is essential to reliable operations and responsible commerical operations (i.e., settlements).	Fulfillment of obligaitons under the ISO Tariff is essential to reliable operations and responsible commerical operations (i.e., settlements).

completed by: Eric Leuze
Date: 17-Mar-03

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Attribution of Activity by Cost Center
Customer Service Activities vs. Other Activities
Development of CAISO Rate Structure Proposal

For Cost Center: Application Support 1722

	Customer Service Activities	Other Activities
Description of Activities	Design and implement Settlements Business process and software business requirements. Provide technical support for ISO Tariff Language development. Ensure ISO Settlements systems' business rules and functionality are compliant with ISO Tariff and business policy.	Provide support to other Settlements' and ISO teams to ensure: -timely production of Settlement statements -timely production of Invoices -disputes and inquiries
# of People	**5**	
Justification	Required to support the FERC Tariff and Settlements and Billing Protocols.	

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completed by: Christine Vangelatos
Date: 3-Apr-03

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Attribution of Activity by Cost Center
CAS Activities vs. Customer Service Activities
Development of CAISO Rate Structure Proposal

For Cost Center: Tariff and Contract Implementation 1723

	Core Reliability Services Activities	Customer Service Activities	Other Activities
Description of Activities	Timely validation of Reliability Must Run (RMR) & Summer Reliability Agreement (SRA) Invoices. Timely processing of RMR & SRA Invoices for Payment.	Compliance with FERC, CPUC, Legal and Regulatory requirements and requests. Validation of Start Up Fuel and Emission Fee Invoices	System development design support for projects directly or indirectly affecting Settlements, including MD02. Facilitating training classes to both internal and external ISO stakeholders.
# of People	6		
Justification	Required under Must Run Service Agreement & Summer Reliability Agreement.	Required under the FERC Tariff and Settlements and Billing Protocols.	Necessary for new or ongoing market functionality.

completed by: Catherine Bodine
Date: 3-Apr-03

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Attribution of Activity by Cost Center
Customer Service Activities vs. Other Activities
Development of CAISO Rate Structure Proposal

For Cost Center: BBS Settlements - Preliminary Settlements 1724

	Customer Service Activities	Other Activities
Description of Activities	Timely production and publishing of daily Settlement statements. Timely monthly invoices generation associated with Daily Market Statements, GMC, TAC and FERC Fees. Compliance with FERC, CPUC, Legal and Regulatory requirements and requests.	System development design support for projects directly or indirectly affecting Settlements, including MD02 (all phases). Managing or supporting tasks relating to Congestion Revenue Rights. Facilitating training classes to both internal and external ISO stakeholders.
# of People	**10**	
Justification	Required under the FERC Tariff and Settlements and Billing Protocols.	Necessary for new or ongoing market functionality.

10

Completed by: Masoud Shafa
Date: 25-Mar-03

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Attribution of Activity by Cost Center
Customer Service Activities vs. Other Activities
Development of CAISO Rate Structure Proposal

For Cost Center: BBS Settlements - Final Settlements 1725

	Customer Service Activities	Other Activities
Description of Activities	Timely production and publishing of daily Settlement statements. Timely monthly invoices generation associated with Daily Market Statements, GMC, TAC and FERC Fees. Resolution of disputes submitted for adjustment from Market Quality. Compliance with FERC, CPUC, Legal and Regulatory requirements and requests.	System development design support for projects directly or indirectly affecting Settlements, including the Settlements System Replacement Project. Managing or supporting tasks relating to Congestion Revenue Rights.
# of People	9	
Justification	Required under the FERC Tariff and Settlements and Billing Protocols.	Necessary for new or ongoing market functionality.

Completed by: Brad Bouillon
Date: 25-Mar-03

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Attribution of Activity by Cost Center
CAS Activities vs. Customer Service Activities
Development of CAISO Rate Structure Proposal

For Cost Center: Contracts & Special Projects 1731

	CAS Activities	Customer Service Activities
Description of Activities	Administer Reliability Must-Run Service Agreements (RMR Agreements) including assisting Operations with implementation and dispatch instructions to meet ISO Control Area reliability; assist in validating RMR costs; negotiate new RMR Agreements needed for reliability; negotiate and administer rates and disputes for RMR Agreements.	Develop, negotiate and administer contracts with Market Participants for participation in the ISO's markets and structure. Facilitate, support and provide testimony for FERC filings, litigation, data requests and investigations. Special projects as assigned by the Officers (i.e. GMC, Access Charge, Distributed Generation, Existing Contract issues, market design, governmental entity issues, etc.).
# of People	5	5
Justification	RMR is an essential aspect needed to support a functioning control area. Without RMR, the ISO Control Area can not be reliably operated.	Contracts are needed to bind each Market Participant to pertinent sections of the ISO Tariff. Contracts provides leadership and support on FERC filings, litigation, data requests and investigations. (The ISO has averaged a subpoena a day in 2002.) Special Projects assignments are based on need and expertise in the Department.

10

completed by: Debi Le Vine
Date: 19-Mar-03

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Attribution of Activity by Cost Center
Customer Service Activities vs. Other Activities
Development of CAISO Rate Structure Proposal

For Cost Center: Client Relations
1741

	Customer Service Activities	Other Activities
Description of Activities		
# of People	20	
Justification		

20

completed by:
Date:

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Attribution of Activity by Cost Center
Distribution of Department Activities across Services
Development of CAISO Rate Structure Proposal

For Cost Center: Manager, Markets
1752

	Core Reliability Services	Energy & Trans. Services (Scalable)	Market Scheduling	Congestion Management	Market Usage	Customer Services
Description of Activities	Control room operations. With the DA and HA GRCs they spend a portion of their time runniing the AS markets which are required for Grid reliability. In addition the RT GRCs all coordinate with the Gen dispatchers and RT schedulers to take care of imbalance energy requirements, congestion and load forecasting	The function of the Senior GRCs is to handle overflow and problems that might arise that are of an unusual nature or that might not be seen on a day-to-day basis.	The DA and HA GRCs operate the markets through which the SCs schedule with the ISO	During the DA and HA market processes CONG is run by the GRCs to provide for the most efficient use of the Control Area.	The A/S markets are accessed through the DA and HA markets and the imbalance energy market is run through the RT GRC	As market participants require training in the use of the systems that are used the GRCs are often asked for assistance to make sure that schedules and bids are submitted properly so as to not hold up the closing of the running of the markets.
# of People	3	1	6	2	5	1
Justification	The services performed by the GRCs in procurring AS and the running of the imbalance energy market are essential to the operation of the Control Area.	Depending upon the requirements of the Control Area at any particular time it can become necessary to have a senior GRC step in to assist in the running of the markets during times of heavy usage.	The majority of the DA and HA GRCs time is spent processing the submitted schedules through SI and SA and ensuring comformance with scheduling protocols.	CONG is the software run during both the DA and HA market processes to allocate transmission usage.	In addition to the bilateral markets run through SI and SA the DA, HA and RT GRCs also run the A/S (DA & HA) and imbalance energy markets (mainly RT).	Training is an integral part of any market structure in which interfaces are required between the ISO and the market participants.

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Completed by: Jim McClain
Date: 18-Mar-03

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Attribution of Activity by Cost Center
Distribution of Department Activities across Services
Development of CAISO Rate Structure Proposal

For Cost Center: Market Engineering 1753

	Core Reliability Services	Market Scheduling	Congestion Management	Market Usage	Customer Services
Description of Activities	Market Engineering supports AS procurement as well as BEEP and ADS for real-time energy dispatch.	Market Engineering supports the SA (Scheduling Application) and BEEP/ADS systems with support personnel on-call 24X7.	As a sub-system within SA Market Engineering supports the functions of CONG in the daily and hourly running of the forward markets.	The AS and BEEP/ADS systems are integral to the operation of the ISO markets and are supported by Market Engineering	As new systems are developed or new users start interacting with the existing systems, training is often done by Market Engineering personnel.
# of People	1	3	1	3	1
Justification	The support of the A/S and BEEP systems is an integral part of the functioning of the ISO Control Area	SA is one of the major systems used to process schedules submitted through the forward markets.	CONG is the software run during both the DA and HA market processes to allocate transmission usage.	Support of the A/S and BEEP/ADS functions are provided for the GRCs on a 24X7 basis	Training is an integral part of any market structure in which interfaces are required between the ISO and the market participants.

Completed by: Jim McClain
Date: 18-Mar-03

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Attribution of Activity by Cost Center
Distribution of Department Activities across Services
Development of CAISO Rate Structure Proposal

For Cost Center: Business Solutions 1755

	Core Reliability Services	Market Scheduling	Congestion Management	Market Usage	Customer Services
Description of Activities	The Business Solutions group supports ETC, BITS and OSMOSIS systems as well as the scheduling of RMR units as done through GRRMA.	The scheduling of interchange transactions is processed through the BITS and ETC interfaces.		The OASIS system is the communication link between the ISO and market participants. This link provides key information about A/S procurement and imbalance energy requirements and costs.	As new systems are developed or new users start interacting with the existing systems, training is often done by Business Solutions personnel.
# of People	0.5	3		2	0.5
Justification	The ETC, BITS and OSMOSIS systems, as supported by the Business Solutions group, are core systems in the operation of the control area. In addition, the scheduling of RMR units through GRRMA, another system supported by Business Solutions, is a necessity in maintaining system reliability.	The BITS and ETC systems are integral parts of the scheduling functions provided by the ISO.		Data availability is a necessary component of any market and this is provided by the ISO through a very fluid OASIS interface. In addition SI is needed to get AS bid into our markets.	Training is an integral part of any market structure in which interfaces are required between the ISO and the market participants.

Completed by: Jim McClain
Date: 18-Mar-03

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Attribution of Activity by Cost Center
Market Services Activities vs. Customer Service Activities
Development of CAISO Rate Structure Proposal

For Cost Center: Market Quality 1756

	Market Services Activities	Customer Services Activities
Description of Activities	Validation, verification and correction of transactional Market operations, Grid operations, metering and contract data that could affect the settlement of Market Participants. Post process design and development that provide the link between market and settlement system designs. Root Cause analysis of issues identified internally and externally. Design, development and maintenance of the Master File application and database.	Dispute analysis and resolution
# of People	10	5
Description of People	1 Manager, 1 Sr. Design Engineer, 1 Design Engineer, 2 Sr. Engineering Analysts, 6 Engineering Analysts and 1 Technical Assistant. Total of 10 Engineers and Analysts	1 Manager, 1 Sr Engineering Analyst, 3 Engineering Analyst
Justification	Identifying area where the company can improve on it's core functions and developing solutions temporary and permanent to ensure the quality of the core business transactions. Due to the amount of changes that the core systems have had to endure since start-up, focus was placed, via Market Quality, on the identification and resolution of long standing and newly identified issues in relation to the core functions and thier effect on settlements. Prior to the formation Market Quality these issue were handled through the client dispute process and not addressed or resolved at the root cause. Market Quality addresses these issues up stream through validation processes, root cause analysis and data correction processes to ensure quality transactional data prior to the settlement process. The majority of Market Quality's efforts are transparent to the customer and provide quality transactional data for settlement purposes.	Per the ISO Tariff, each Scheduling Coordinator has the right to dispute specific charges on their preliminary settlement statement, adjustments due to settlement additions on their final settlement statement and adjustments due to re-run or retrospective settlements. Market Quality is assigned any disputes that do not already have a standard response or are a know policy issue awaiting resolution through and external process. The Market Quality team researches each dispute that is assigned to determine it's validity. Each dispute is also excepted or denied with an explanation of the situation leading the the decision. All valid disputes are addressed with the broader departmental team to determine root cause and resolution. 90+ percent of the disputes handled by Marekt Quality are invalid and provide validation and education for the client.

completed by: Nancy Traweek
Date:

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Attribution of Activity by Cost Center
Distribution of Department Activities across Services
Development of CAISO Rate Structure Proposal

For Cost Center: Market Integration 1757

	Core Reliability Services	Market Scheduling	Congestion Management	Market Usage	Customer Services
Description of Activities	Market Integration brings on new systems and tools that are required for the operation of the Control Area.	Market Integration implements new tools for the markets which can assist the floor and/or market participants in the scheduling process. They also get involved in reviewing market design changes.		Market Integration has developed and assisted in the implementation of systems and tools used in the procurement and use of A/S and imbalance energy.	As new systems are developed training is often done by Market Integration personnel.
# of People	0.5	2		2	0.5
Justification	Assuring that the integration of new systems doesn't interfere with the efficient operation of existing systems is part of the responsibility of Market Integration	Implementing new scheduling systems or new tools used for scheduling assist the market in efficient use of their resources.		An enhanced market design can take on many looks. The integration can involve any number of market service activities including A/S or imbalance energy functionalities.	Training is an integral part of any market structure in which interfaces are required between the ISO and the market participants.

Completed by: Jim McClain
Date: 18-Mar-03

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Labor Assignments by Cost Center
Development of California ISO Rates

For Cost Center:

	Core Reliability Services Activities	Energy and Transmission Services Activities	Forward Scheduling Activities	Congestion Management Activities	Market Usage Activities	Settlements, Metering and Client Relations	
Description of Activities							
# of People							0
Position descriptions							
Justification							

completed by:
Date:

Contract Assignments by Cost Center
Development of California ISO Rates

For Cost Center:

	Core Reliability Services Activities	Energy and Transmission Services Activities	Forward Scheduling Activities	Congestion Management Activities	Market Usage Activities	Settlements, Metering and Client Relations
Description of Activities						
Percent of contract costs						
Justification						

completed by:
Date:

Paradise, Theodore

From: Arikawa, Ben [BArikawa@caiso.com]
Sent: Friday, September 12, 2003 11:34 AM
To: Jaschke, Allen
Subject: Assistance with GMC unbundling (resend)

1462.xls

Steve, Allen (Sorry I had the wrong name here before)

We need your assistance in completing the workpapers and documentation for the new rate design.

Based on my conversations with our consultants, Barkovich & Yap, this is how we would like to proceed. Instead of the cost assignment template that was passed out on August 11, we would like to know what systems your cost center supports and the level of the effort (labor or overall) is expended on each system you support.

Attached is a spreadsheet in which you can document the systems and level of effort that is expended. You can edit the spreadsheet if you like (for example, if you want to use number of people or FTEs dedicated to certain systems rather than the percentage of labor).

There are two pages: one for labor and one for contracts. The systems that we have identified are in one column, activities descriptions in the next, personnel and position descriptions are the last two columns. The contracts sheet is similar except that it would contain contract descriptions and percentages.

If at all possible, please complete this by Sept. 17. If you have any questions, please give me a call.

Ben Arikawa
Senior Financial Analyst
California Independent System Operator
151 Blue Ravine Road
Folsom, CA 95630

Voice: (916) 608-5958
fax: (916) 351-2259

email: barikawa@caiso.com
<<1462.xls>>

Labor Assignments by Cost Center
Development of California ISO Rates

Cost Center Name	Field Data Acquisition Systems
Cost Center Number	1462

	Description of Activities
Scheduling Infrastructure	
Scheduling Architecture	
Balancing Energy Ex Post Price	
Congestion Management	
Ancillary Services Management	
Automated Dispatch System	
Open Access Same Time Information System	
Global Resource Reliability Management Application	
Out of Sequence Market Operation Settlements Information System	
Automated Load Forecast System	
Firm Transmission Right and Secondary Registration System	
Bill's Interchange Schedule	
Existing Transmission Contracts Calculator	
Outage Scheduler	
Energy Management System	
Field Data Acquisition	
RMR Application Validation Engine:	
Reliability Management System	
Balance of Business Systems	
Meter Data Acquisition System	
Engineering Analysis Tools	
Grid Operations Training Simulator	
Hour-Ahead Data AnalysisTool, Day-Ahead Data AnalysisTool,	
Electronic Tagging	

Generator Communication Project (GCP), Remote Intelligence Gateway (RIG)	
Scheduling & Logging for ISO California	
Local Area Network, Wide Area Network	
Transmission Map Plotting & Display	
Process Information System	

completed by:	
Date:	

Number of people	Position Descriptions

Contract Assignments by Cost Center
Development of California ISO Rates

Cost Center Name	Field Data Acquisition Systems
Cost Center Number	1462

	Description of Activities
Scheduling Infrastructure	
Scheduling Architecture	
Balancing Energy Ex Post Price	
Congestion Management	
Ancillary Services Management	
Automated Dispatch System	
Open Access Same Time Information System	
Global Resource Reliability Management Application	
Out of Sequence Market Operation Settlements Information System	
Automated Load Forecast System	
Firm Transmission Right and Secondary Registration System	
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Electronic Tagging	
Generator Communication Project (GCP), Remote Intelligence Gateway (RIG)	
Scheduling & Logging for ISO California	
Local Area Network, Wide Area Network	
Process Information System	
Transmission Map Plotting & Display	
Other	

completed by:	
Date:	

Percent of Contract	Comments

Paradise, Theodore

From: Arikawa, Ben [BArikawa@caiso.com]
Sent: Friday, September 12, 2003 11:35 AM
To: Whitley, Eric
Subject: Assistance with GMC unbundling (resend)

1461.xls

Steve, Eric (Sorry I had the wrong name here, but attached the right template),

We need your assistance in completing the workpapers and documentation for the new rate design. I know that we spoke sometime last month, but I don't remember where we left off.

Based on my conversations with our consultants, Barkovich & Yap, this is how we would like to proceed. Instead of the cost assignment template that was passed out on August 11, we would like to know what systems your cost center supports and the level of the effort (labor or overall) is expended on each system you support.

Attached is a spreadsheet in which you can document the systems and level of effort that is expended. You can edit the spreadsheet if you like (for example, if you want to use number of people or FTEs dedicated to certain systems rather than the percentage of labor).

There are two pages: one for labor and one for contracts. The systems that we have identified are in one column, activities descriptions in the next, personnel and position descriptions are the last two columns. The contracts sheet is similar except that it would contain contract descriptions and percentages.

If at all possible, please complete this by Sept. 17. If you have any questions, please give me a call.

Ben Arikawa
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<<1461.xls>>

Labor Assignments by Cost Center
Development of California ISO Rates

Cost Center Name	Control Systems Services
Cost Center Number	1461

	Description of Activities
Scheduling Infrastructure	
Scheduling Architecture	
Balancing Energy Ex Post Price	
Congestion Management	
Ancillary Services Management	
Automated Dispatch System	
Open Access Same Time Information System	
Global Resource Reliability Management Application	
Out of Sequence Market Operation Settlements Information System	
Automated Load Forecast System	
Firm Transmission Right and Secondary Registration System	
Bill's Interchange Schedule	
Existing Transmission Contracts Calculator	
Outage Scheduler	
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Generator Communication Project (GCP), Remote Intelligence Gateway (RIG)	
Scheduling & Logging for ISO California	
Local Area Network, Wide Area Network	
Transmission Map Plotting & Display	
Process Information System	

completed by:	
Date:	

Number of people	Position Descriptions

Contract Assignments by Cost Center
Development of California ISO Rates

Cost Center Name	Control Systems Services
Cost Center Number	1461

	Description of Activities
Scheduling Infrastructure	
Scheduling Architecture	
Balancing Energy Ex Post Price	
Congestion Management	
Ancillary Services Management	
Automated Dispatch System	
Open Access Same Time Information System	
Global Resource Reliability Management Application	
Out of Sequence Market Operation Settlements Information System	
Automated Load Forecast System	
Firm Transmission Right and Secondary Registration System	
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Hour-Ahead Data AnalysisTool, Day-Ahead Data AnalysisTool,	
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Generator Communication Project (GCP), Remote Intelligence Gateway (RIG)	
Scheduling & Logging for ISO California	
Local Area Network, Wide Area Network	
Process Information System	
Transmission Map Plotting & Display	
Other	

completed by:	
Date:	

Percent of Contract	Comments

Paradise, Theodore

From: Arikawa, Ben [BArikawa@caiso.com]
Sent: Tuesday, October 07, 2003 6:07 PM
To: Meinhofer, Steve
Cc: Cogdill, Jan
Subject: Assistance with GMC unbundling (resend)

1482.xls

Steve,

We need your assistance in completing the workpapers and documentation for the new rate design.

Based on my conversations with our consultants, Barkovich & Yap, this is how we would like to proceed. Instead of the cost assignment template that was passed out on August 11, we would like to know what systems your cost center supports and the level of the effort (labor or overall) is expended on each system you support.

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There are two pages: one for labor and one for contracts. The systems that we have identified are in one column, activities descriptions in the next, personnel and position descriptions are the last two columns. The contracts sheet is similar except that it would contain contract descriptions and percentages.

If you have any questions, please give me a call.

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fax: (916) 351-2259

email: barikawa@caiso.com

Labor Assignments by Cost Center
Development of California ISO Rates

Cost Center Name	Market Systems Support Services
Cost Center Number	1482

	Description of Activities
Scheduling Infrastructure	
Scheduling Architecture	
Balancing Energy Ex Post Price	
Congestion Management	
Ancillary Services Management	
Automated Dispatch System	
Open Access Same Time Information System	
Global Resource Reliability Management Application	
Out of Sequence Market Operation Settlements Information System	
Automated Load Forecast System	
Firm Transmission Right and Secondary Registration System	
Bill's Interchange Schedule	
Existing Transmission Contracts Calculator	
Outage Scheduler	
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Scheduling & Logging for ISO California	
Local Area Network, Wide Area Network	
Transmission Map Plotting & Display	
Process Information System	

completed by:	
Date:	

Number of people	Position Descriptions

Contract Assignments by Cost Center
Development of California ISO Rates

Cost Center Name	Market Systems Support Services
Cost Center Number	1482

	Description of Activities
Scheduling Infrastructure	
Scheduling Architecture	
Balancing Energy Ex Post Price	
Congestion Management	
Ancillary Services Management	
Automated Dispatch System	
Open Access Same Time Information System	
Global Resource Reliability Management Application	
Out of Sequence Market Operation Settlements Information System	
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Scheduling & Logging for ISO California	
Local Area Network, Wide Area Network	
Transmission Map Plotting & Display	
Process Information System	
Other	

completed by:	
Date:	

Percent of Contracts	Comments

8.2.4 Operating and Capital Reserves Cost.

The budgeted annual cost of pay-as-you-go capital expenditures and reasonable coverage of debt service obligations. Such reserves shall be utilized to minimize the impact of any variance between forecast and actual costs throughout the year ("Operating and Capital Reserves Costs").

8.3 Allocation of the Grid Management Charge Among Scheduling Coordinators.

The costs recovered through the Grid Management Charge shall be allocated to the seven service charges that comprise the Grid Management Charge. If the ISO's revenue requirement for any service charge changes from the most recent FERC-approved revenue requirement for that service charge, the costs recovered through that service charge shall be delineated in a filing to be made at FERC as set forth in Section 8.4. The seven service charges are as follows:

(1) Core Reliability Services Charge,

(2) Energy Transmission Services Net Energy Charge,

(3) Energy Transmission Services Uninstructed Deviations Charge,

(4) Forward Scheduling Charge,

(5) Congestion Management Charge,

(6) Market Usage Charge, and

(7) Settlements, Metering, and Client Relations Charge.

The seven charges shall be levied separately monthly in arrears on all Scheduling Coordinators based on the billing determinants specified below for each charge in accordance with formulae set out in Appendix F, Schedule 1, Part A of this Tariff.

8.3.1 Core Reliability Services Charge.

The Core Reliability Services Charge for a Scheduling Coordinator is calculated using the Scheduling Coordinator's metered non-coincident peak hourly demand during the month (in megawatts). The rate for the Core Reliability Services Charge is determined by dividing the GMC costs allocated to this service category, including a specified percentage of the costs for the Settlements, Metering, and Client Relations Charge determined to be in excess of what is recovered by that charge, by the total of the forecasted metered non-coincident peak hourly demand for all months during the year, according to the formula in Appendix F, Schedule 1, Part A of this Tariff.

8.3.2 Energy Transmission Services Net Energy Charge.

The Energy Transmission Services Net Energy Charge for each Scheduling Coordinator is calculated using that Scheduling Coordinator's Metered Control Area Load (in megawatt hours). The rate for the Energy Transmission Services Net Energy Charge is determined by dividing the GMC costs allocated to this service category, including a specified percentage of the costs for the Settlements, Metering, and Client Relations Charge determined to be in excess of what is recovered by that charge, by the total forecasted Metered Control Area Load, according to the formula in Appendix F, Schedule 1, Part A of this Tariff.

8.3.3 Energy Transmission Services Uninstructed Deviations Charge.

The Energy Transmission Services Uninstructed Deviations Charge for each Scheduling Coordinator is calculated using that Scheduling Coordinator's net uninstructed deviations by settlement interval. The rate for the Energy Transmission Services Uninstructed Deviations Charge is determined by dividing the GMC costs allocated to this service category, including a specified percentage of the costs for the Settlements, Metering, and Client Relations Charge determined to be in excess of what is recovered by that charge, by the total forecasted net uninstructed deviations by settlement interval according to the formula in Appendix F, Schedule 1, Part A of this Tariff.

8.3.4 Forward Scheduling Charge.

The Forward Scheduling Charge for each Scheduling Coordinator is calculated using the sum of that Scheduling Coordinator's Final Hour-Ahead Schedules, including all awarded Ancillary Services bids, with a value other than 0 MW, submitted to the scheduling infrastructure/scheduling application system. The rate for the Forward Scheduling Charge is determined by dividing the GMC costs allocated to this service category, including a specified percentage of the costs for the Settlements, Metering, and Client Relations Charge determined to be in excess of what is recovered by that charge, by the total forecasted Final Hour-Ahead Schedules and awarded Ancillary Service bids submitted to the ISO, according to the formula in Appendix F, Schedule 1, Part A of this Tariff.

8.3.5 Congestion Management Charge.

The Congestion Management Charge for each Scheduling Coordinator is calculated as the product of the rate for the Congestion Management Charge and the absolute value of the net scheduled inter-zonal flow (excluding flows pursuant to Existing Contracts) per path for that Scheduling Coordinator. The rate for the Congestion Management Charge is determined by dividing the GMC costs allocated to this service category, including a specified percentage of the costs for the Settlements, Metering, and Client Relations Charge determined to be in excess of what is recovered by that charge, by the total forecasted inter-zonal scheduled flow (excluding flows pursuant to Existing Contracts) per path in MWh, according to the formula in Appendix F, Schedule 1, Part A of this Tariff.

8.3.6 Market Usage Charge.

The Market Usage Charge for each Scheduling Coordinator is calculated using the absolute value of the Scheduling Coordinator's market purchases and sales of Ancillary Services, Supplemental Energy, Instructed Imbalance Energy, and net Uninstructed Imbalance Energy (with uninstructed deviations being netted by settlement interval). The rate for the Market Usage Charge is determined by dividing the GMC costs allocated to this service category, including a specified percentage of the costs for the Settlements, Metering, and Client Relations Charge determined to be in excess of what is recovered by that charge, by the total forecasted number of market purchases and sales, according to the formula in Appendix F, Schedule 1, Part A of this Tariff.

8.3.7 Settlements, Metering, and Client Relations Charge.

The Settlements, Metering, and Client Relations Charge for each Scheduling Coordinator is fixed at $500.00 per month, per Scheduling Coordinator ID with an invoice value other than $0.00 in the current trade month, as indicated in Appendix F, Schedule 1, Part A of this Tariff. Excess GMC costs related to the provision of these services that are not recovered through this charge are allocated to the other GMC service categories as specified above and in Appendix F, Schedule 1, Part E of this Tariff.

8.4 Calculation and Adjustment of the Grid Management Charge.

The seven charges set forth in Section 8.3 that comprise the Grid Management Charge shall be calculated through the formula set forth in Appendix F, Schedule 1, Part A of this Tariff. The formula set forth in Appendix F, Schedule 1, Part C of this Tariff sums the Operating Costs (less any available expense recoveries), Financing Costs, and Operating and Capital Reserves Costs associated with each of the seven ISO service charges to obtain a total revenue requirement. This revenue requirement is allocated among the seven charges of the GMC through the application of the factors specified in Appendix F, Schedule 1, Part E of this Tariff.

The revenue requirement for each service then shall be divided by the forecast annual or periodic billing determinant volume to obtain a rate for each service, which will be payable by Scheduling Coordinators as set forth in Section 8.3. The rates so established will be adjusted annually, through the operation of the formula set forth in Appendix F, Schedule 1, Part A of this Tariff. The ISO shall make an informational filing with the FERC each year, before the adjusted rates go into effect, as described in Appendix F, Schedule 1, Part D of this Tariff, to reflect any change in the annual revenue requirement, variance between forecast and actual costs for the previous year or period, or any surplus revenues from the previous year or period (as defined in Section 8.5), or the inability to recover from a Scheduling Coordinator its share of the Grid Management Charge, or any under-achievement of a forecast of the billing determinant volumes used to establish the rates. Appendix F, Schedule 1, Part B of this Tariff sets forth the conditions under which a quarterly adjustment to the Grid Management Charge will be made.

8.4.1 Credits and Debits of the Grid Management Charge.

In addition to the adjustments permitted under Section 11.6.3.3, the ISO shall credit or debit, as appropriate, the account of a Scheduling Coordinator for any overpayment or underpayment of the Grid Management Charge that the ISO determines occurred due to error, omission, or miscalculation by the ISO or the Scheduling Coordinator.

8.5 Operating and Capital Reserves Account.

Revenues collected to fund the ISO financial operating reserves shall be deposited in an Operating and Capital Reserves Account until such account reaches a level specified by the ISO Governing Board. The Operating and Capital Reserves Account shall be calculated separately for each GMC service category (Core Reliability Services, Energy Transmission Services, Forward Scheduling, Congestion Management, Market Usage, and Settlements, Metering and Client Relations). If the Operating and Capital Reserves Account as calculated for such service category is fully funded, surplus funds will be considered an offset to the revenue requirement of the next fiscal year.

8.6 Transition Mechanism.

During the ten-year transition period described in Section 4 of Schedule 3 to Appendix F, the Original Participating TOs collectively shall pay to the ISO each year an amount equal to, annually, for all New Participating TOs, the amount, if any, by which the New Participating TO's cost of Existing High Voltage Facilities associated with deliveries of Energy to Gross Loads in the PTO Service Area of the New Participating TO is increased by the implementation of the High Voltage Access Charge described in Schedule 3 to Appendix F. Responsibility for such payments shall be allocated to Original Participating TOs in

Applicable Reliability Criteria	The reliability standards established by NERC, WSCC, and Local Reliability Criteria as amended from time to time, including any requirements of the NRC.
Applicants	Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company and any others as applicable.

Transfer Capacity to implement all Preferred Schedules simultaneously or, in real time, to serve all Generation and Demand. "Congested" shall be construed accordingly.

Congestion Management The alleviation of Congestion in accordance with Applicable ISO Protocols and Good Utility Practice.

Congestion Management Charge The component of the Grid Management Charge that provides for the recovery of the ISO's costs of operating the Congestion Management process, including, but not limited to, the management and operation of inter-zonal congestion markets, adjustment bids, taking Firm Transmission Rights and Existing Contracts into account, and determining the price for mitigating congestion for flows on congested paths. The formula for determining the Congestion Management Charge is set forth in Appendix F, Schedule 1, Part A of this Tariff.

Connected Entity A Participating TO or any party that owns or operates facilities that are electrically interconnected with the ISO Controlled Grid.

Constraints Physical and operational limitations on the transfer of electrical power through transmission facilities.

Contingency Disconnection or separation, planned or forced, of one or more components from an electrical system.

Control Area An electric power system (or combination of electric power systems) to which a common AGC scheme is applied in order to: i) match, at all times, the power output of the Generating Units within the electric power system(s), plus the Energy purchased from entities outside the electric power system(s), minus Energy sold to entities outside the electric power system, with the Demand within the electric power system(s); ii) maintain scheduled interchange with other Control Areas, within the limits of Good Utility Practice; iii) maintain the frequency of the electric power system(s) within reasonable limits in accordance with Good Utility Practice; and iv) provide sufficient generating capacity to maintain operating reserves in accordance with Good Utility Practice.

Control Area Gross Load For the purpose of calculating and billing Minimum Load Costs, Emission Costs Charge and Start-Up Fuel Costs Charge, Control Area Gross Load is all Demand for Energy within the ISO Control Area. Control Area Gross Load shall not include Energy consumed by:

(a) generator auxiliary Load equipment that is dedicated to the production of Energy and is electrically connected at the same point as the Generating Unit (*e.g.*, auxiliary Load equipment that is served via a distribution line that is separate from the switchyard to which the Generating Unit is connected will not be considered to be electrically connected at the same point); and

(b) Load that is isolated electrically from the ISO Control Area (*i.e.*, Load that is not synchronized with the ISO Control Area).

Converted Rights — Those transmission service rights as defined in Section 2.4.4.2.1 of the ISO Tariff.

Core Reliability Services Charge — The component of the Grid Management Charge that provides for the recovery of the ISO's costs of providing a basic, non-scalable level of reliable operation for the ISO Control Area and meeting regional and national reliability requirements. The formula for determining the Core Reliability Services Charge is set forth in Appendix F, Schedule 1, Part A of this Tariff.

Cost Shifting — A transfer of costs from one group of customers to another or from one utility to another.

CPUC — The California Public Utilities Commission, or its successor.

Energy	The electrical energy produced, flowing or supplied by generation, transmission or distribution facilities, being the integral with respect to time of the instantaneous power, measured in units of watt-hours or standard multiples thereof, e.g., 1,000 Wh=1kWh, 1,000 kWh=1MWh, etc.
Energy Bid	The price at or above which a Generator has agreed to produce the next increment of Energy.
Energy Efficiency Services	Services that are intended to assist End-Users in achieving savings in their use of Energy or increased efficiency in their use of Energy.
Energy Transmission Services Net Energy Charge	The component of the Grid Management Charge that provides, in conjunction with the Energy Transmission Services Uninstructed Deviations Charge, for the recovery of the ISO's costs of providing reliability on a scalable basis, i.e., a function of the intensity of the use of the transmission system within the Control Area and the occurrence of system outages and disruptions. The formula for determining the Energy Transmission Services Net Energy Charge is set forth in Appendix F, Schedule 1, Part A of this Tariff.
Energy Transmission Services Uninstructed Deviations Charge	The component of the Grid Management Charge that provides, in conjunction with the Energy Transmission Services Net Energy Charge, for the recovery of the ISO's costs of providing reliability on a scalable basis, in particular for the costs associated with balancing transmission flows that result from uninstructed deviations. The formula for determining the Energy Transmission Services Uninstructed Deviations Charge is set forth in Appendix F, Schedule 1, Part A of this Tariff.

Entitlements	The right of a Participating TO obtained through contract or other means to use another entity's transmission facilities for the transmission of Energy.
Environmental Dispatch	Dispatch designed to meet the requirements of air quality and other environmental legislation and environmental agencies having authority or jurisdiction over the ISO.
Environmental Quality	In relation to Energy, means Energy which involves production sources that reduce harm to the environment.
Equipment Clearances	The process by which the ISO grants authorization to another party to connect or disconnect electric equipment interconnected to the ISO Controlled Grid.
Ex Post GMM	GMM that is calculated utilizing the real time Power Flow Model in accordance with Section 7.4.2.1.2.
Ex Post Price	The Hourly Ex Post Price or the BEEP Interval Ex Post Price.
Ex Post Transmission Loss	Transmission Loss that is calculated based on Ex Post GMM.

Final Hour-Ahead Schedule	The Hour-Ahead Schedule of Generation and Demand that has been approved by the ISO as feasible and consistent with all other Schedules based on the ISO's Hour-Ahead Congestion Management procedures.
Final Invoice	The invoice due from a RMR Owner to the ISO at termination of the RMR Contract.
Final Schedule	A Schedule developed by the ISO following receipt of a Revised Schedule from a Scheduling Coordinator.
Final Settlement Statement	The restatement or recalculation of the Preliminary Settlement Statement by the ISO following the issue of that Preliminary Settlement Statement.
Flexible Generation	Generation that is capable of, and for which the Generator has agreed to, adjust operating levels in response to real time market price or ISO control signals.
Forced Outage	An Outage for which sufficient notice cannot be given to allow the Outage to be factored into the Day-Ahead Market or Hour-Ahead Market scheduling processes.
Forward Scheduling Charge	The component of the Grid Management Charge that provides for the recovery of the ISO's costs, including, but not limited to the costs of providing the ability to Scheduling Coordinators to forward schedule Energy and Ancillary Services and the cost of processing accepted Ancillary Service bids. For purposes of the Forward Scheduling Charge, a schedule is represented by each Final Hour-Ahead Schedule with a value other than 0 MW submitted to the scheduling infrastructure/scheduling application system (import, export, Load, Generation, inter-SC trade, and Ancillary Services, including self-provided Ancillary Services) submitted to the ISO's scheduling infrastructure. The

formula for determining the Forward Scheduling Charge is set forth in Appendix F, Schedule 1, Part A of this Tariff.

FPA Parts II and III of the Federal Power Act, 16 U.S.C. § 824 et seq., as they may be amended from time to time.

FTR (Firm Transmission Right) A contractual right, subject to the terms and conditions of the ISO Tariff, that entitles the FTR Holder to receive, for each hour of the term of the FTR, a portion of the Usage Charges received by the ISO for transportation of energy from a specific originating Zone to a specific receiving Zone and, in the event of an uneconomic curtailment to manage Day-Ahead congestion, to a Day-Ahead scheduling priority higher than that of a schedule using Converted Rights capacity that does not have an FTR.

Grid Management Charge The ISO monthly charge on all Scheduling Coordinators that provides for the recovery of the ISO's costs listed in Section 8.2 through the seven service charges described in Section 8.3 calculated in accordance with the formula rate set forth in Appendix F, Schedule 1, Part A of this Tariff. The seven charges that comprise the Grid Management Charge consist of: 1) the Core Reliability Services Charge, 2) the Energy Transmission Services Net Energy Charge, 3) the Energy Transmission Services Uninstructed Deviations Charge, 4) the Forward Scheduling Charge, 5) the Congestion Management Charge, 6) the Market Usage Charge, and 7) the Settlements, Metering, and Client Relations Charge.

Grid Operations Charge An ISO charge that recovers redispatch costs incurred due to Intra-Zonal Congestion in each Zone. These charges will be paid to the ISO by the Scheduling Coordinators, in proportion to their metered Demand within, and metered exports from, the Zone to a neighboring Control Area.

Gross Load For the purposes of calculating the transmission Access Charge, Gross Load is all Energy (adjusted for distribution losses) delivered for the supply of Loads directly connected to the transmission facilities or Distribution System of a UDC or MSS, and all Energy provided by a Scheduling Coordinator for the supply of Loads not directly connected to the transmission facilities or Distribution System of a UDC or MSS. Gross Load shall exclude Load with respect to which the Wheeling Access Charge is payable and the portion of the Load of an individual retail customer of a UDC, MSS, or Scheduling Coordinator that is served by a Generating Unit that: (a) is located on the customer's site or provides service to the customers site through arrangements as authorized by Section 218 of the California Public Utilities Code; (b) is a qualifying small power production facility or qualifying cogeneration facility, as those terms are defined in the FERC's regulations implementing Section 201 of the Public Utility Regulatory Policies Act of 1978; and

Market Participant — An entity, including a Scheduling Coordinator, who participates in the Energy marketplace through the buying, selling, transmission, or distribution of Energy or Ancillary Services into, out of, or through the ISO Controlled Grid.

Market Usage Charge — The component of the Grid Management Charge that provides for the recovery of the ISO's costs, including, but not limited to the costs for processing Supplemental Energy and Ancillary Service bids, maintaining the Open Access Same-Time Information System, monitoring market performance, ensuring generator compliance with market protocols, and determining Market Clearing Prices. The formula for determining the Market Usage Charge is set forth in Appendix F, Schedule 1, Part A of this Tariff.

Master File A file containing information regarding Generating Units, Loads and other resources.

Meter Data Energy usage data collected by a metering device or as may be otherwise derived by the use of Approved Load Profiles.

Meter Points Locations on the ISO Controlled Grid at which the ISO requires the collection of Meter Data by a metering device.

Metered Control Area Load For purposes of calculating and billing the Energy Transmission Services Net Energy Charge component of the Grid Management Charge, Metered Control Area Load is: (a) all metered Demand for Energy of Scheduling Coordinators for the supply of Loads in the ISO's Control Area, plus (b) all Energy for exports by Scheduling Coordinators from the ISO Control Area; less (c) Energy associated with the Load of a retail customer of a Scheduling Coordinator, UDC, or MSS that is served by a Generating Unit that: (i) is located on the same site as the customer's Load or provides service to the customer's Load through arrangements as authorized by Section 218 of the California Public Utilities Code; (ii) is a qualifying small power production facility or qualifying cogeneration facility, as those terms are defined in FERC's regulations implementing Section 201 of the Public Utility Regulatory Policies Act of 1978; and (iii) the customer secures Standby Service from a Participating TO under terms approved by a Local Regulatory Authority or FERC, as applicable, or the customer's Load can be curtailed concurrently with an outage of the Generating Unit.

Metered Quantities	For each Direct Access End-User, the actual metered amount of MWh and MW; for each Participating Generator the actual metered amounts of MWh, MW, MVAr and MVArh.
Minimum Load Costs	The costs a generating unit incurs operating at minimum load.
Monthly Peak Load	The maximum hourly Demand on a Participating TO's transmission system for a calendar month, multiplied by the Operating Reserve Multiplier.
MSS (Metered Subsystem)	A geographically contiguous system located within a single Zone which has been operating as an electric utility for a number of years prior to the ISO Operations Date as a municipal utility, water district, irrigation district, State agency or Federal power administration subsumed within the ISO Control Area and encompassed by ISO certified revenue quality meters at each interface point with the ISO Controlled Grid and ISO certified revenue quality meters on all Generating Units or, if aggregated, each individual resource and Participating Load internal to the system, which is operated in accordance with a MSS Agreement described in Section 23.1.
MSS Operator	An entity that owns an MSS and has executed a MSS Agreement described in Section 3.3.1.

Order No. 889 — The final rule issued by FERC entitled "Open Access Same-Time Information System (formerly Real Time Information Networks) and Standards of Conduct," 61 Fed. Reg. 21,737 (May 10, 1996), FERC Stats. & Regs., Regulations Preambles [1991-1996] ¶ 31,035 (1996), Order on Rehearing, Order No. 889-A, 78 FERC ¶ 61,221 (1997), as it may be amended from time to time.

Original Participating TO — A Participating TO that was a Participating TO as of January 1, 2000.

Outage — Disconnection or separation, planned or forced, of one or more elements of an electric system.

Overgeneration — A condition that occurs when total Generation exceeds total Demand in the ISO Control Area.

Settlement	Process of financial settlement for products and services purchased and sold undertaken by the ISO under Section 11 of the ISO Tariff. Each Settlement will involve a price and a quantity.
Settlement Account	An Account held at a bank situated in California, designated by a Scheduling Coordinator or a Participating TO pursuant to the Scheduling Coordinator's SC Agreement or in the case of a Participating TO, Section 2.2.1 of the TCA, to which the ISO shall pay amounts owing to the Scheduling Coordinator or the Participating TO under the ISO Tariff.
Settlement Period	For all ISO transactions the period beginning at the start of the hour, and ending at the end of the hour. There are twenty-four Settlement Periods in each Trading Day, with the exception of a Trading Day in which there is a change to or from daylight savings time.
Settlement Quality Meter Data	Meter Data gathered, edited, validated, and stored in a settlement-ready format, for Settlement and auditing purposes.
Settlement Statement	Either or both of a Preliminary Settlement Statement or Final Settlement Statement.
Settlement Statement Re-run	The re-calculation of a Settlement Statement in accordance with the provisions of the ISO Tariff including any protocol of the ISO.
Settlements, Metering, and Client Relations Charge	The component of the Grid Management Charge that provides for the recovery of the ISO's costs, including, but not limited to the costs of maintaining customer account data, providing account information to customers, responding to customer inquiries, calculating market charges, resolving customer disputes, and the costs associated with the ISO's Settlement,

billing, and metering activities. Because this is a fixed charge per Scheduling Coordinator ID, costs associated with activities listed above also are allocated to other charges under the Grid Management Charge according to formula set forth in Appendix F, Schedule 1, Part A of this Tariff.

Schedule 1

Grid Management Charge

<u>Part A – Monthly Calculation of Grid Management Charge (GMC)</u>

The Grid Management Charge consists of seven separate service charges: (1) the Core Reliability Services Charge, (2) the Energy Transmission Services Net Energy Charge, (3) the Energy Transmission Services Uninstructed Deviations Charge, (4) the Forward Scheduling Charge, (5) the Congestion Management Charge, (6) the Market Usage Charge, and (7) the Settlements, Metering, and Client Relations Charge.

1. The rate in $/MW for the Core Reliability Services Charge will be calculated by dividing the GMC costs, as determined in accordance with Part C of this Schedule 1, allocated to this service category in accordance with Part E of this Schedule 1, by the total of the forecasted Scheduling Coordinators' metered non-coincident peak hourly demand in MW for all months during the year.

2. The rate in $/MWh for the Energy Transmission Services Net Energy Charge will be calculated by dividing the GMC costs, as determined in accordance with Part C of this Schedule 1, allocated to this service category in accordance with Part E of this Schedule 1, by the total annual forecast Metered Control Area Load in MWh.

3. The rate in $/MWh for the Energy Transmission Services Uninstructed Deviations Charge will be calculated by dividing the GMC costs, as determined in accordance with Part C of this Schedule 1, allocated to this service category in accordance with Part E of this Schedule 1, by the absolute value of total annual forecast net uninstructed deviations (netted within a settlement interval) in MWh.

4. The rate in $ per Schedule for the Forward Scheduling Charge will be calculated by dividing the GMC costs, as determined in accordance with Part C of this Schedule 1, allocated to this service category in accordance with Part E of this Schedule 1, by the annual forecast number of non-zero MW Final Hour-Ahead Schedules, including all awarded Ancillary Service bids.

5. The rate in $/MWh for the Congestion Management Charge will be calculated by dividing the GMC costs, as determined in accordance with Part C of this Schedule 1, allocated to this service category in accordance with Part E of this Schedule 1, by the total annual forecast Scheduling Coordinators' inter-zonal scheduled flow (excluding flows pursuant to Existing Contracts) per path in MWh.

6. The rate in $/MWh for the Market Usage Charge will be calculated by dividing the GMC costs, as determined in accordance with Part C of this Schedule 1, allocated to this service category in accordance with Part E of this Schedule 1, by the annual forecast total purchases and sales (including out-of-market transactions) of Ancillary Services, Supplemental Energy, Instructed Imbalance Energy, and net Uninstructed Imbalance Energy (with uninstructed deviations being netted by settlement interval) in MWh.

7. The rate for the Settlements, Metering, and Client Relations Charge will be fixed at $500.00 per month, per Scheduling Coordinator Identification Number ("SC ID") with an invoice value other than $0.00 in the current trade month.

The rates for the foregoing charges shall be adjusted automatically each year, effective January 1 for the following twelve months, in the manner set forth in Part D of this Schedule.

Part B – Quarterly Adjustment, If Required

Each component rate of the Grid Management Charge will be adjusted automatically on a quarterly basis, up or down, so that rates reflect the annual revenue requirement as stated in the ISO's annual informational filing, if the estimated billing determinant volumes for that component, on an annual basis, change by 5% or more during the year. Such adjustment may be implemented not more than once per calendar quarter, and will be effective the first day of the next calendar month.

The rates will be adjusted in accordance with the following formula:

According to the formulae listed in Appendix F, Schedule 1, Part A with the billing determinant(s) readjusted on a going-forward basis to reflect the 5% or greater change from the estimated billing determinant provided in the annual informational filing.

Part C – Costs Recovered through the GMC

As provided in Section 8 of the ISO Tariff, the Grid Management Charge includes the following costs, as projected in the ISO's budget for the year to which the Grid Managment Charge applies:

- Operating costs (as defined in Section 8.2.2)
- Financing costs (as defined in Section 8.2.3), including Start-Up and Development costs and
- Operating and Capital Reserve costs (as defined in Section 8.2.4)

Such costs, for the ISO as a whole, are allocated to the seven service charges that comprise the Grid Management Charge: (1) Core Reliability Services Charge, (2) Energy Transmission Services Net Energy Charge, (3) Energy Transmission Services Uninstructed Deviations Charge, (4) Forward Scheduling Charge, (5) Congestion Management Charge, (6) Market Usage Charge, and (7) Settlements, Metering, and Client Relations Charge, according to the factors listed in Part E of this Schedule 1, and

adjusted annually for:

- any surplus revenues from the previous year as deposited in the Operating and Capital Reserve Account, as defined under Section 8.5, or deficiency of revenues, as recorded in a memorandum account;

divided by:

- forecasted annual billing determinant volumes;

adjusted quarterly for:

- a change in the volume estimate used to calculate the individual Grid Management Charge components, if, on an annual basis, the change is 5% or more.

The Grid Management Charge revenue requirement formula is as follows:

Grid Management Charge revenue requirement =

- Operating Expenses + Debt Service + [(Coverage Requirement x Senior Lien Debt Service) and/or (Cash Funded Capital Expenditures)] - Interest Earnings - Other Revenues - Reserve Transfer

Where,

- **Operating Expenses** = O&M Expenses plus Taxes Other Than Income Taxes and Penalties

- **O&M Expenses** = Transmission O&M Expenses (Accounts 560-574) plus Customer Accounting Expenses (Accounts 901-905) plus Customer Service and Informational Expenses (Accounts 906-910) plus Sales Expenses (Accounts 911-917) plus Administrative & General Expenses (Accounts 920-935)
- **Taxes Other Than Income Taxes =** those taxes other than income taxes which relate to ISO operating income (Account 408.1)
- **Penalties** = payments by the ISO for penalties or fines incurred for violation of WECC reliability criteria (Account 426.3)
- **Debt Service** = for any fiscal year, scheduled principal and interest payments, sinking fund payments related to balloon maturities, repayment of commercial paper notes, net payments required pursuant to a payment obligation, or payments due on any ISO notes. This amount includes the current year accrued principal and interest payments due in April of the following year.
- **Coverage Requirement** = 25% of the Senior Lien Debt Service.
- **Senior Lien Debt Service** = all Debt Service that has a first lien on ISO Net Operating Revenues (Account 128 subaccounts).
- **Cash Funded Capital Expenditures** = Post current fiscal year capital additions (Accounts 301-399) funded on a pay-as-you-go basis.
- **Interest Earnings** = Interest earnings on Operating and Capital Reserve balances (Account 419). Interest on bond or note proceeds specifically designated for capital projects or capitalized interest is excluded.
- **Other Revenues** = Amounts booked to Account 456 subaccounts. Such amounts include but are not limited to application fees, WECC security coordinator reimbursements, and fines assessed and collected by the ISO.
- **Reserve Transfer** = the projected reserve balance for December 31 of the prior year less the Reserve Requirement as adopted by the ISO Board and FERC. If such amount is negative, the amount may be divided by two, so that the reserve is replenished within a two-year period. (Account 128 subaccounts)
- **Reserve Requirement** = 15% of Annual Operating Expenses.

A separate revenue requirement shall be established for each component of the Grid Management Charge by developing the revenue requirement for the ISO as a whole and then assigning such costs to the seven service categories using the allocation factors provided in Appendix F, Schedule 1, Part E of this Tariff.

Part D – Information Requirements

Budget Schedule

The ISO Governing Board shall set forth a budget schedule that shall specify the dates for the budget posting and public workshop events noted below and other significant budget related milestones providing an opportunity for public input.

Budget Posting

The ISO will post on its Internet site the preliminary proposed ISO operating and capital budget to be effective during the subsequent fiscal year, and the projected billing determinant volumes used to develop the rate for each component of the Grid Management Charge.

Public Workshop

Subsequent to the website posting, and prior to (i) the Board approval of the budget and (ii) the submission of the informational filing described in the next paragraph of this Part D, the ISO shall hold a public budget workshop where it will provide an overview of and answer questions from stakeholders on the proposed budget, cost allocation, and the charges for each of the ISOs services for the following year.

Annual Informational Filing

The ISO will make a filing each year no later than December 15, or the first business day thereafter, at FERC that shall contain projected cost data on the ISO presented in conformance with the budget approved by the ISO Board and the FERC Uniform System of Accounts (USOA). This filing shall contain such information as is required to update the GMC rates resulting from the application of the formulae in Part A of this Schedule for the following calendar year.

Periodic Financial reports

The ISO will create periodic financial reports consisting of an income statement, balance sheet, statement of operating reserves, and such other reports as are required by the ISO Board of Governors. The periodic financial reports will be posted on the ISO's Website not less than quarterly.

Part E – Cost Allocation

The Grid Management Charge revenue requirement, determined in accordance with Part C of this Schedule 1, shall be allocated to the seven service charges specified in Part A of this Schedule 1 as follows. Expenses projected to be recorded in each cost center shall be allocated among the seven charges in accordance with the allocation factors listed in Table 1 to this Schedule 1. In the event the ISO budgets for projected expenditures for cost centers are not specified in Table 1 to this Schedule, such expenditures shall be allocated based on the allocation factors for the respective ISO division hosting that newly-created cost center. Such divisional allocation factors are specified in Table 1 to this Schedule 1.

Debt service expenditures for the ISO's year 2000 (or subsequently refinanced) bond offering shall be allocated among the seven charges in accordance with the allocation factors listed in Table 1 to this Schedule 1. Capital expenditures shall be allocated among the seven charges in accordance with the allocation factors listed in Table 2 to this Schedule 1 for the system for which the capital expenditure is projected to be made.

Any costs allocated by the factors listed in Table 1 and Table 2 to the Settlements, Metering, and Client Relations category that would remain un-recovered after the assessment of the charge for that service specified in Section 7 of Part A of this Schedule 1 on forecasted billing determinant volumes shall be reallocated to the remaining GMC service categories in the ratios set forth in Table 3 to this Schedule 1.

Costs allocated to the Energy Transmission Services category in the following tables are further apportioned to the Energy Transmission Services Net Energy and Energy Transmission Services Uninstructed Deviations subcategories in 80% and 20% ratios, respectively.

Table 1

O&M, Debt Service, and Other Expense Recoveries Cost Allocation Factors

CC #	Cost Center	CRS	ETS	FS	CM	MU	SMCR	Total
1100	**CEO Division**	**44%**	**22%**	**4%**	**5%**	**10%**	**16%**	**100%**
1111	CEO - General	44%	22%	4%	5%	10%	16%	100%
1241	MD02	7%	0%	14%	11%	28%	40%	100%
1521	Grid Planning	63%	38%	0%	0%	0%	0%	100%
1300	**Finance Division**	**44%**	**21%**	**4%**	**4%**	**10%**	**16%**	**100%**
1311	CFO - General	44%	21%	4%	4%	10%	16%	100%
1321	Accounting	44%	22%	4%	5%	10%	16%	100%
1331	Financial Planning and Treasury	44%	22%	4%	5%	10%	16%	100%
1351	Facilities	44%	21%	4%	4%	10%	17%	100%
1361	Security & Corporate Services	44%	21%	4%	4%	10%	17%	100%

1400	**Information Services Division**	**38%**	**7%**	**10%**	**5%**	**9%**	**31%**	**100%**
1411	Chief Information Officer	38%	7%	10%	5%	9%	31%	100%
1422	Corporate & Enterprise Applications	33%	7%	1%	25%	13%	21%	100%
1424	Asset Management	35%	6%	11%	5%	11%	32%	100%
1431	End User Support	38%	14%	8%	3%	9%	27%	100%
1432	Computer Operations and Infrastructure Services	34%	9%	12%	3%	9%	33%	100%
1433	Network Services	43%	12%	9%	3%	9%	24%	100%
1441	Outsourced Contracts	42%	11%	10%	3%	9%	25%	100%
1442	Production Support	25%	0%	18%	3%	8%	47%	100%
1451	Information Support Services	25%	0%	18%	3%	8%	47%	100%
1461	Control Systems	96%	2%	0%	0%	1%	1%	100%
1462	Field Data Acquisition System (FDAS)	21%	0%	0%	0%	0%	79%	100%
1463	Operations Systems Services	50%	3%	6%	1%	6%	33%	100%
1466	Enterprise Applications	48%	7%	1%	1%	3%	39%	100%
1467	Settlement Systems Services	27%	11%	2%	2%	5%	52%	100%
1468	Corporate Application Support and Administration	44%	21%	4%	4%	10%	17%	100%
1469	Analytical and Reporting Applications	10%	0%	0%	65%	25%	0%	100%
1471	IT Planning	25%	0%	18%	3%	8%	47%	100%
1481	Markets and Scheduling System Services	47%	3%	24%	3%	18%	6%	100%
1482	Market Systems Support Services	45%	1%	19%	6%	24%	6%	100%
1500	**Grid Operations Division**	**67%**	**33%**	**0%**	**0%**	**0%**	**0%**	**100%**
1511	VP Grid Operations	67%	33%	0%	0%	0%	0%	100%
1542	Outage Coordination	95%	5%	0%	0%	0%	0%	100%
1543	Loads and Resources	49%	51%	0%	0%	0%	0%	100%
1544	Real-Time Scheduling	60%	40%	0%	0%	0%	0%	100%
1545	Grid Operations	67%	33%	0%	0%	0%	0%	100%
1546	Security Coordination	100%	0%	0%	0%	0%	0%	100%
1547	Engineering and Maintenance	46%	54%	0%	0%	0%	0%	100%
1548	OSAT Group - General	93%	7%	0%	0%	0%	0%	100%
1549	Operations Training	50%	50%	0%	0%	0%	0%	100%
1554	Special Projects Engineering	43%	57%	0%	0%	0%	0%	100%

1558	Transmission Maintenance	58%	42%	0%	0%	0%	0%	100%
1559	Operations Application Support	60%	40%	0%	0%	0%	0%	100%
1561	Operations Engineering South	65%	35%	0%	0%	0%	0%	100%
1562	Operations Engineering North	55%	45%	0%	0%	0%	0%	100%
1563	Operations Coordination	75%	25%	0%	0%	0%	0%	100%
1564	Operations Scheduling	100%	0%	0%	0%	0%	0%	100%
1565	Pre-Scheduling and Support	77%	23%	0%	0%	0%	0%	100%
1566	Regional Coordination - General	100%	0%	0%	0%	0%	0%	100%
1600	**Legal and Regulatory Division**	**36%**	**22%**	**4%**	**7%**	**17%**	**15%**	**100%**
1611	VP General Counsel - General	36%	22%	4%	7%	17%	15%	100%
1631	Legal and Regulatory	44%	22%	4%	5%	10%	16%	100%
1641	Market Analysis	15%	26%	0%	20%	31%	7%	100%
1642	Market Surveillance Committee	25%	25%	0%	25%	25%	0%	100%
1651	Board of Governors	44%	22%	4%	5%	10%	16%	100%
1661	Compliance - General	22%	20%	12%	0%	29%	17%	100%
1662	Compliance - Audits	8%	0%	0%	0%	50%	42%	100%
1700	**Market Services Division**	**17%**	**2%**	**9%**	**9%**	**20%**	**41%**	**100%**
1711	VP Market Services - General	17%	2%	9%	9%	20%	41%	100%
1721	Billing and Settlements-General	25%	0%	0%	0%	0%	75%	100%
1722	Business Development Support	0%	0%	0%	0%	0%	100%	100%
1723	RMR Settlements	80%	20%	0%	0%	0%	0%	100%
1724	BBS - PSS	0%	0%	0%	0%	0%	100%	100%
1725	BBS - FSS	0%	0%	0%	0%	0%	100%	100%
1731	Contracts and Special Projects	43%	7%	0%	0%	0%	50%	100%
1741	Client Relations	0%	0%	0%	0%	0%	100%	100%
1751	Market Operations - General	31%	0%	15%	15%	35%	4%	100%
1752	Manager of Markets	27%	5%	27%	22%	18%	0%	100%
1753	Market Engineering	21%	0%	0%	28%	43%	7%	100%
1755	Business Solutions	6%	0%	47%	12%	29%	6%	100%
1756	Market Quality - General	0%	0%	0%	0%	71%	29%	100%
1757	Market Integration	7%	0%	30%	30%	26%	7%	100%

1800	**Corporate and Strategic Development Division**	**44%**	**21%**	**4%**	**4%**	**10%**	**16%**	**100%**
1811	VP Corporate and Strategic Development - General	44%	21%	4%	4%	10%	16%	100%
1821	Communications	44%	22%	4%	5%	10%	16%	100%
1831	Strategic Development	44%	22%	4%	5%	10%	16%	100%
1841	Human Resources	44%	21%	4%	4%	10%	17%	100%
1851	Project Office	44%	22%	4%	5%	10%	16%	100%
1861	Regulatory Policy	44%	22%	4%	5%	10%	16%	100%
Other Revenue and Credits								
	SC Application and Training Fees	0%	0%	0%	0%	0%	100%	100%
	WECC Reimbursement/NERC Reimbursement	100%	0%	0%	0%	0%	0%	100%
	Interest Earnings	37%	12%	9%	5%	11%	25%	100%
Debt Service Related Allocations		33%	8%	15%	5%	9%	29%	100%

Table 2

Capital Cost Allocation Factors

System	CRS	ETS	FS	CM	MU	SMCR	Total
ACC Upgrades (Communication between ISO & IOUs)	100%	0%	0%	0%	0%	0%	100%
Ancillary Services Management (ASM) Component of SA	15%	0%	40%	0%	45%	0%	100%
Application Development Tools	23%	0%	22%	3%	7%	45%	100%
Automated Dispatch System (ADS)	50%	0%	25%	0%	20%	5%	100%
Automated Load Forecast System (ALFS)	70%	0%	10%	0%	20%	0%	100%
Automatic Mitigation Procedure (AMP)	85%	0%	0%	0%	15%	0%	100%
Backup systems (Legato/Quantum)	23%	0%	22%	3%	7%	45%	100%

Balance of Business Systems (BBS)	0%	0%	0%	0%	0%	100%	100%
Balancing Energy Ex Post Price (BEEP) Component of SA	50%	0%	20%	10%	20%	0%	100%
Bill's Interchange Schedule (BITS)	85%	0%	0%	0%	15%	0%	100%
CaseWise (process modeling tool)	44%	21%	4%	4%	10%	17%	100%
CHASE	44%	21%	4%	4%	10%	17%	100%
Common Information Model (CIM)	100%	0%	0%	0%	0%	0%	100%
Compliance (Blaze)	19%	16%	10%	0%	33%	22%	100%
Congestion Management (CONG) (Component of SA)	10%	0%	0%	65%	25%	0%	100%
Congestion Reform-DSOW	50%	0%	0%	50%	0%	0%	100%
Congestion Revenue Rights (CRR)	0%	0%	0%	80%	20%	0%	100%
DataWarehouse	24%	18%	6%	9%	24%	18%	100%
Dept. of Market Analysis Tools (SAS/MARS)	15%	26%	0%	20%	31%	7%	100%
Dispute Tracking System (Remedy)	0%	0%	0%	0%	0%	100%	100%
Documentum	44%	21%	4%	4%	10%	17%	100%
Electronic Tagging (Etag)	100%	0%	0%	0%	0%	0%	100%
Energy Management System (EMS)	100%	0%	0%	0%	0%	0%	100%
Engineering Analysis Tools	60%	40%	0%	0%	0%	0%	100%
Evaluation of Market Separation	0%	0%	0%	50%	50%	0%	100%
Existing Transmission Contracts Calculator (ETCC)	25%	0%	20%	15%	20%	20%	100%
FERC Study Software	0%	0%	0%	0%	100%	0%	100%
Firm Transmission Right (FTR) and Secondary Registration System (SRS)	0%	0%	15%	60%	15%	10%	100%

Global Resource Reliability Management Application (GRRMA)	75%	15%	0%	0%	10%	0%	100%
Grid Operations Training Simulator (GOTS)	56%	44%	0%	0%	0%	0%	100%
Hour-Ahead Data AnalysisTool, Day-Ahead Data AnalysisTool,	0%	0%	100%	0%	0%	0%	100%
Human Resources	44%	21%	4%	4%	10%	17%	100%
IBM Contract	37%	14%	10%	4%	9%	26%	100%
Integrated Forward Market (IFM)	10%	0%	35%	0%	55%	0%	100%
Internal Development	23%	0%	22%	3%	7%	45%	100%
Interzonal Congestion Management reform - Real Time	50%	0%	0%	50%	0%	0%	100%
Land and Building Costs	44%	21%	4%	4%	10%	17%	100%
Local Area Network (LAN)	44%	21%	4%	4%	10%	17%	100%
Locational Marginal Pricing (LMPM)	10%	0%	35%	0%	55%	0%	100%
Market Transaction System (MTS)	0%	0%	0%	0%	100%	0%	100%
Masterfile	20%	0%	20%	0%	55%	5%	100%
MD02 Capital	7%	0%	14%	11%	28%	40%	100%
Meter Data Acquisition System (MDAS)	0%	0%	0%	0%	0%	100%	100%
Miscellaneous (2004 related projects)	23%	0%	22%	3%	7%	45%	100%
Monitoring (Tivoli)	23%	0%	22%	3%	7%	45%	100%
New Resource Interconnection (NRI)	100%	0%	0%	0%	0%	0%	100%
New System Equipment (replacement of owned equipment)	23%	0%	22%	3%	7%	45%	100%
NT/web servers	44%	21%	4%	4%	10%	17%	100%
NT-servers	44%	21%	4%	4%	10%	17%	100%

Oracle Enterprise Manager (OEM)	27%	0%	18%	5%	9%	41%	100%
Office Automation - desktop/laptop (OA)	44%	21%	4%	4%	10%	17%	100%
Office equipment (scanner, printer, copier, fax, Communication Equipment)	44%	21%	4%	4%	10%	17%	100%
Open Access Same Time Information System (OASIS)	10%	0%	25%	10%	35%	20%	100%
Operational Meter Analysis and Reporting (OMAR)	0%	0%	0%	0%	0%	100%	100%
Oracle Corporate Financials	44%	21%	4%	4%	10%	17%	100%
Oracle Licenses	27%	0%	18%	5%	9%	41%	100%
Oracle Market Financials BBS	0%	0%	0%	0%	0%	100%	100%
Out of Sequence Market Operation Settlements Information System (OOS)	5%	5%	0%	0%	90%	0%	100%
Outage Scheduler (OS)	50%	0%	10%	20%	20%	0%	100%
Participating Intermittent Resource Project (PIRP)	0%	0%	94%	0%	6%	0%	100%
Physical Facilities Software Application/Furniture/Leasehold Improvements	44%	21%	4%	4%	10%	17%	100%
Process Information System (PI)	80%	0%	0%	0%	10%	10%	100%
Rational Buyer	100%	0%	0%	0%	0%	0%	100%
Real Time Energy Dispatch System (REDS)	100%	0%	0%	0%	0%	0%	100%
Real Time Nodal Market	35%	0%	10%	0%	55%	0%	100%
Reliability Management System (RMS)	100%	0%	0%	0%	0%	0%	100%
Remedy (related to Transmission Registry, New Resource Interconnection, and Resource Registry)	100%	0%	0%	0%	0%	0%	100%
Remote Intelligent Gateway (RIG) & Data Processing Gateway (DPG)	100%	0%	0%	0%	0%	0%	100%
Resource Register (RR)	100%	0%	0%	0%	0%	0%	100%

RMR Application Validation Engine (RAVE)	100%	0%	0%	0%	0%	0%	100%
Scheduling & Logging for ISO California (SLIC)	65%	0%	15%	5%	15%	0%	100%
Scheduling Architecture (SA)	24%	0%	20%	26%	30%	0%	100%
Scheduling Infrastructure (SI)	0%	0%	94%	0%	6%	0%	100%
Scheduling Infrastructure Business Rules (SIBR)	0%	0%	94%	0%	6%	0%	100%
Security Constrained Economic Dispatch (SCED)	40%	0%	0%	0%	60%	0%	100%
Security- External/Physical	44%	21%	4%	4%	10%	17%	100%
Security-ISS (CUDA)	23%	0%	22%	3%	7%	45%	100%
Settlements and Market Clearing	0%	0%	0%	0%	0%	100%	100%
Sign Board (Symon Board maint.)	44%	21%	4%	4%	10%	17%	100%
Startup Costs through 3/31/98, Working Capital-3 months	44%	21%	4%	4%	10%	17%	100%
Storage (EMC symmetrix)	19%	10%	14%	4%	12%	42%	100%
System Equipment Buyouts (lease buyouts)	43%	1%	7%	2%	11%	36%	100%
Telephone/PBX	44%	21%	4%	4%	10%	17%	100%
Training Systems	23%	0%	22%	3%	7%	45%	100%
Transmission Constrained Unit Commitment (TCUC) Must Offer Obligation	100%	0%	0%	0%	0%	0%	100%
Transmission Map Plotting & Display	50%	50%	0%	0%	0%	0%	100%
Trustee Costs, Interest-Capitalized, User Groups	54%	1%	11%	16%	17%	2%	100%
Utilities - System i.e. Print drivers	23%	0%	22%	3%	7%	45%	100%
Vitria (Middleware)	23%	0%	22%	3%	7%	45%	100%
Wide Area Network (WAN)	41%	2%	19%	1%	8%	29%	100%

Capital Expenditures for Systems not Specified	32%	7%	15%	6%	11%	29%	100%

Table 3

Reallocation Factors for Projected Unrecovered Portion of Settlements, Metering, and Client Relations Revenue Requirement

	CRS	ETS	FS	CM	MU	SMCR	Total
Functional Association of Settlements, Metering, and Client Relations	0.0%	70.3%	0.0%	8.2%	21.4%	0.0%	100.0%

any of which may submit comments and objections to the ISO within two weeks of the date of posting of the draft on the ISO Home Page.

SABP 2.3.4 Final Payments Calendar

No later than October 31st in each year, the ISO will publish pursuant to Section 11.24.1 of the ISO Tariff the final ISO Payments Calendar for the following calendar year, after considering the comments and objections received from Scheduling Coordinators, Black Start Generators, Participating TOs and Owners. The final ISO Payments Calendar will be posted on the ISO Home Page.

SABP 2.3.5 Update the Final Payments Calendar

If as a result of a tariff amendment approved by FERC the final ISO Payments Calendar developed in accordance with SABP 2.3.3 and 2.3.4 above is rendered inconsistent with the timing set forth in the tariff, the ISO shall update the final ISO Payments Calendar to make it consistent with the tariff as approved by FERC on the date on which the tariff amendment goes into effect. The ISO shall simultaneously send out a notice to market participants that the final ISO Payments Calendar has been revised.

SABP 2.3.6 Final Calendar Binding

The final ISO Payments Calendar shall be binding on the ISO and on Scheduling Coordinators, Black Start Generators, Participating TOs and Owners.

SABP 3 COMPUTATION OF CHARGES

SABP 3.1 Description of Charges to be Settled

The ISO shall, based on the Settlement Quality Meter Data it has received, or, if Settlement Quality Meter Data is not available, based on the best available information or estimate it has received, calculate the following:

(a) the amount due from each Scheduling Coordinator for its share for the relevant month of the seven components of the Grid Management Charge in accordance with the formula located in Appendix F, Schedule 1, Part A of this Tariff. These Charges shall accrue on a monthly basis.

(b) the amount due from each Scheduling Coordinator for the Grid Operations Charge in accordance with Appendix F, Schedule 2 of this Tariff. This charge shall accrue on a monthly basis.

(c) the amount due from and/or owed to each Scheduling Coordinator for the Charge for each Ancillary Service in accordance with Appendix C, for each of the Settlement Periods of Day 0.

than payments calculated as due to the ISO Creditors for the same Trading Day. These charges will be allocated amongst the Scheduling Coordinators who traded on that Trading Day pro rata to their metered Demand (including exports) in MWh of Energy for that Trading Day. In the event that the charges due from ISO Debtors are higher than the payments due to ISO Creditors, the ISO shall allocate a payment to the Scheduling Coordinators who traded on that Trading Day pro rata to their metered Demand (including exports) in MWh of Energy for that Trading Day.

(d) amounts required with respect to payment adjustments for regulating Energy as calculated in accordance with Section 2.5.27.1 of the ISO Tariff. These charges will be allocated amongst the Scheduling Coordinators who traded on that Trading Day pro rata to their metered Demand (including exports) in MWh for that Trading Day.

SABP 3.2 Method of Settlement of Charges

SABP 3.2.1 Settlement of Payments to/from Scheduling Coordinators and Participating TOs

The ISO will calculate for each charge the amounts payable by the relevant Scheduling Coordinator, Black Start Generator or Participating TO for each Settlement Period of the Trading Day, and the amounts payable to that Scheduling Coordinator, Black Start Generator or Participating TO for each charge for each Settlement Period of that Trading Day and shall arrive at a net amount payable for each charge by or to that Scheduling Coordinator, Black Start Generator or Participating TO for each charge for that Trading Day. Each of these amounts will appear in the Preliminary and Final Settlement Statements that the ISO will provide to the relevant Scheduling Coordinator, Black Start Generator or Participating TO as provided in SABP 4.

The seven components of the Grid Management Charge will be included in the Preliminary Settlement Statement and Final Settlement Statement with the other types of charges referred to in SABP 3.1, but a separate invoice for the Grid Management Charge, stating the rate, billing determinant volume, and total charge for each of its seven components, will be issued by the ISO to the Scheduling Coordinator.

SABP 4 SETTLEMENT STATEMENTS

SABP 4.1 Preliminary Settlement Statements

SABP 4.1.1 Timing of Preliminary Settlement Statements

The ISO shall provide to each Scheduling Coordinator, Black Start Generator or Participating TO for validation a Preliminary Settlement Statement for each Trading Day in accordance with the ISO Payments Calendar.

SABP 4.4.5 **ISOContact**

If the ISO does not agree with the amount claimed or if it requires additional information, it shall make reasonable efforts (taking into account the time it received the notice of dispute and the complexity of the issue involved) to contact the relevant Scheduling Coordinator, Black Start Generator or Participating TO to resolve the issue before issuing the Final Settlement Statement. If it is not possible to contact the relevant party, the ISO shall issue the Final Settlement Statement without taking into account the dispute notice.

SABP 4.4.6 **Payment Pending Dispute**

Each Scheduling Coordinator, Black Start Generator or Participating TO which receives an invoice shall pay any net debit and shall be entitled to receive any net credit shown in the invoice on the Payment Date, whether or not there is any dispute regarding the amount of the debit or credit. The provisions of Section 13 (Dispute Resolution) of the ISO Tariff shall apply to the disputed amount.

SABP 4.5 **Settlement Statement Re-runs**

SABP 4.5.1 **Notice**

If a Scheduling Coordinator, Black Start Generator or Participating TO, (having made reasonable efforts to resolve with the ISO any dispute relating to a Preliminary Settlement Statement pursuant to SABP 4.4) requires a Settlement Statement re-run, it shall send at any time to the ISO Governing Board a notice in writing.

SABP 4.5.2 **ISO Tariff**

The provisions of Sections 11.6.3, 11.6.3.1, 11.6.3.2 and 11.6.3.3 of the ISO Tariff relating to Settlement Statement re-runs shall apply to all Scheduling Coordinators, Black Start Generators or Participating TOs who require a Settlement re-run in accordance with this SABP 4.5.

SABP 5 **INVOICES**

The ISO shall provide on the day specified in the ISO Payments Calendar an invoice in the format set out in SABP Appendix I showing:

(a) amounts which according to each of the Preliminary and Final Settlement Statements of that Billing Period are to be paid from or to each Scheduling Coordinator, Black Start Generator or Participating TO;

(b) the Payment Date, being the date on which such amounts are to be paid or received and the time for such payment; and

(c) details (including the account number, bank name and Fed-Wire transfer instructions) of the ISO Clearing Account to which any amounts owed by the Scheduling Coordinator, Black Start Generator or Participating TO are to be paid.

A separate invoice for the Grid Management Charge, stating the rate, billing determinant volume and total charge for each of its seven components, will be issued by the ISO to the Scheduling Coordinator.

A separate invoice for Interest, issued on the preliminary invoice date, stating the total charges for each Trade Month in which interest is charged, will be issued by the ISO.

SABP 6 PAYMENT PROCEDURES

SABP 6.1 Time of Payment

SABP 6.1.1 Payment Date

Subject to SABP 6.1.2, payment will be made by the ISO and by each Scheduling Coordinator, Black Start Generator and Participating TO on the Payment Date as set forth in Section 11.3.2.

SABP 6.1.2 Prepayments

(a) A Scheduling Coordinator may choose to pay at an earlier date than the Payment Date specified in the ISO Payments Calendar by way of prepayment provided it notifies the ISO by electronic means before submitting its prepayment.

(b) Prepayment notifications must specify the dollar amount prepaid.

(c) Prepayments must be made by Scheduling Coordinators via Fed-Wire into their ISO prepayment account designated by the ISO. The relevant Scheduling Coordinator shall grant the ISO a security interest on all funds in its ISO prepayment account.

(d) On any Payment Date the ISO shall be entitled to cause funds from the relevant Scheduling Coordinator's ISO prepayment account to be transferred to the ISO Clearing Account in such amounts as may be necessary to discharge in full that Scheduling Coordinator's payment obligation arising in relation to that Payment Date.

(e) Any funds held in the relevant Scheduling Coordinator's ISO prepayment account shall be treated as part of that Scheduling Coordinator's Security.

(f) Interest (or other income) accruing on the relevant Scheduling Coordinator's ISO prepayment account shall inure to the benefit of that Scheduling Coordinator and shall be added to the balance of its ISO prepayment account on a monthly basis.

(g) Funds held in an ISO prepayment account by a Scheduling Coordinator may be recouped, offset or applied by the ISO to any outstanding financial obligations of that Scheduling Coordinator to the ISO or to other Scheduling Coordinators under this Protocol.

excess will be credited to the Surplus Account pursuant to SABP 6.5.2(a).

(c) The funds referred to in SABP 6.5.2(a) pertaining to default interest referred to in SABP 6.10.5 shall first be applied towards any unpaid creditor balances for the trade month in which the default interest was assessed and second to any other unpaid creditor balances Only after all unpaid creditor balances are satisfied in full will any excess funds pertaining to default interest be credited to the Surplus Account pursuant to SABP 6.5.2(a).

SABP 6.5.3 Distribution of Funds

In the event that there are funds in the ISO Surplus Account in excess of an amount to be determined by the ISO Governing Board and noticed by the ISO to Market Participants, the amount of such excess will be distributed to Scheduling Coordinators using the same method of apportioning the refund as the method employed in apportioning the liability for the Grid Management Charge.

SABP 6.5.4 Trust

All amounts standing to the credit of the ISO Surplus Account will be held at all times on trust for Market Participants in accordance with this Protocol.

SABP 6.6 System Failure

SABP 6.6.1 At ISO Debtor's Bank

If any ISO Debtor becomes aware that a payment will not, or is unlikely to be, remitted to the ISO Bank by 10:00 am on the relevant Payment Date for any reason (including failure of the Fed-Wire or any computer system), it shall immediately notify the ISO, giving full details of the payment delay (including the reasons for the payment delay). The ISO Debtor shall make all reasonable efforts to remit payment as soon as possible, by an alternative method if necessary, to ensure that funds are received for value no later than 10:00 am on the Payment Date, or as soon as possible thereafter.

SABP 6.6.2 At the ISO's Bank

In the event of failure of any electronic transfer system affecting the ISO Bank, the ISO shall use reasonable efforts to establish alternative methods of remitting funds to the ISO Creditors' Settlement Accounts by close of banking business on that Payment Date, or as soon as possible thereafter. The ISO shall notify the ISO Debtors and the ISO Creditors of occurrence of the system failure and the alternative methods and anticipated time of payment.

SABP 6.7 Payment Default

Subject to SABP 6.8, if by 10:00 am on a Payment Date the ISO, in its reasonable opinion, believes that all or any part of any amount due to be remitted to the ISO Clearing Account by any Scheduling

APPENDIX A

[Not Used]

8.3 Allocation of the Grid Management Charge Among Scheduling Coordinators ~~and Other Appropriate Parties~~.

The costs recovered through the Grid Management Charge shall be allocated to the ~~three~~ seven service charges that comprise the Grid Management Charge. If the ISO's revenue r~~R~~equirement for any service charge changes from the most recent FERC-approved revenue requirement for that service charge, the costs recovered through that service charge shall be delineated in a filing to be made at FERC as set forth in Section 8.4. The seven ~~three~~ service charges are as follows:

(1) ~~Control Area~~ Core Reliability Services Charge,

(2) Energy Transmission Services Net Energy Charge,

~~Congestion Management Charge, and~~

(3) ~~Ancillary Services and Real-Time Energy Operations Charge~~ Energy Transmission Services Uninstructed Deviations Charge,

(4) Forward Scheduling Charge,

(5) Congestion Management Charge,

(6) Market Usage Charge, and

(7) Settlements, Metering, and Client Relations Charge.

The ~~three~~ seven charges shall be levied separately monthly in arrears on all Scheduling Coordinators ~~and Other Appropriate Parties~~ based on the billing determinants specified below for each charge in accordance with formulae set out in Appendix F, Schedule 1, Part A of this Tariff.

8.3.1 ~~Control Area~~ Core Reliability Services Charge.

The ~~Control Area~~ Core Reliability Services Charge for a Scheduling Coordinator ~~or Other Appropriate Party~~ is calculated using the Scheduling Coordinator's metered non-coincident peak hourly demand during the month (in megawatts) ~~as the product of the rate for the Control Area Services Charge and the Control Area Gross Load and exports of the Scheduling~~

~~Coordinator or Other Appropriate Party~~. The rate for the ~~Control Area~~ Core Reliability Services Charge is determined by dividing the GMC costs allocated to this service category, including a specified percentage of the costs for the Settlements, Metering, and Client Relations Charge determined to be in excess of what is recovered by that charge, by the total of the forecasted metered non-coincident peak hourly demand for all months during the year,~~Control Area Gross Load and exports,~~ according to the formula in Appendix F, Schedule 1, Part A of this Tariff.

8.3.2 Energy Transmission Services Net Energy Charge ~~Congestion Management Charge~~.

The Energy Transmission Services Net Energy Charge ~~Congestion Management Charge~~ for each Scheduling Coordinator ~~or Other Appropriate Party~~ is calculated using that Scheduling Coordinator's Metered Control Area Load (in megawatt hours) ~~as the product of the rate for the Congestion Management Charge and the absolute value of the net scheduled inter-zonal flow (excluding flows pursuant to Existing Contracts) per path for that Scheduling Coordinator~~. The rate for the Energy Transmission Services Net Energy Charge ~~Congestion Management Charge~~ is determined by dividing the GMC costs allocated to this service category, including a specified percentage of the costs for the Settlements, Metering, and Client Relations Charge determined to be in excess of what is recovered by that charge, by the total forecasted Metered Control Area Load,~~Scheduling Coordinators' inter-zonal scheduled flow (excluding ETCs) per path,~~ according to the formula in Appendix F, Schedule 1, Part A of this Tariff.

8.3.3 Energy Transmission Services Uninstructed Deviations Charge ~~Ancillary Services and Real-Time Energy Operations Charge~~.

The Energy Transmission Services Uninstructed Deviations Charge ~~Ancillary Services and Real-Time Energy Operations Charge~~ for each Scheduling Coordinator ~~or Other Appropriate Party~~ is calculated using that Scheduling Coordinator's net uninstructed deviations by settlement interval~~as the product of the rate for the Ancillary Services and Real-Time Energy Operations Charge and the Scheduling Coordinator's or Other Appropriate Party's total purchases and sales (including out-of-market energy resources) of Ancillary Services,~~

~~Supplemental Energy, and Imbalance Energy (both instructed and uninstructed)~~. The rate for the ~~Ancillary Services and Real-Time Energy Operations~~Energy Transmission Services Uninstructed Deviations Charge is determined by dividing the GMC costs allocated to this service category, including a specified percentage of the costs for the Settlements, Metering, and Client Relations Charge determined to be in excess of what is recovered by that charge, by the total forecasted net uninstructed deviations by settlement interval ~~purchases and sales of Ancillary Services, Supplemental Energy and Imbalance Energy (both instructed and uninstructed)~~ according to the formula in Appendix F, Schedule 1, Part A of this Tariff. ~~Energy procured to cover line losses or other transmission losses also shall be assessed this charge.~~

8.3.4 Forward Scheduling Charge.

The Forward Scheduling Charge for each Scheduling Coordinator is calculated using the sum of that Scheduling Coordinator's Final Hour-Ahead Schedules, including all awarded Ancillary Services bids, with a value other than 0 MW, submitted to the scheduling infrastructure/scheduling application system. The rate for the Forward Scheduling Charge is determined by dividing the GMC costs allocated to this service category, including a specified percentage of the costs for the Settlements, Metering, and Client Relations Charge determined to be in excess of what is recovered by that charge, by the total forecasted Final Hour-Ahead Schedules and awarded Ancillary Service bids submitted to the ISO, according to the formula in Appendix F, Schedule 1, Part A of this Tariff.

8.3.5 Congestion Management Charge.

The Congestion Management Charge for each Scheduling Coordinator is calculated as the product of the rate for the Congestion Management Charge and the absolute value of the net scheduled inter-zonal flow (excluding flows pursuant to Existing Contracts) per path for that Scheduling Coordinator. The rate for the Congestion Management Charge is determined by dividing the GMC costs allocated to this service category, including a specified percentage of the costs for the Settlements, Metering, and Client Relations Charge determined to be in excess of what is recovered by that charge, by the total forecasted inter-zonal scheduled flow (excluding flows pursuant to Existing Contracts) per path in MWh, according to the formula in Appendix F, Schedule 1, Part A of this Tariff.

8.3.6 Market Usage Charge.

The Market Usage Charge for each Scheduling Coordinator is calculated using the absolute value of the Scheduling Coordinator's market purchases and sales of Ancillary Services, Supplemental Energy, Instructed Imbalance Energy, and net Uninstructed Imbalance Energy (with uninstructed deviations being netted by settlement interval). The rate for the Market Usage Charge is determined by dividing the GMC costs allocated to this service category, including a specified percentage of the costs for the Settlements, Metering, and Client Relations Charge determined to be in excess of what is recovered by that charge, by the total forecasted number of market purchases and sales, according to the formula in Appendix F, Schedule 1, Part A of this Tariff.

8.3.7 Settlements, Metering, and Client Relations Charge.

The Settlements, Metering, and Client Relations Charge for each Scheduling Coordinator is fixed at $500.00 per month, per Scheduling Coordinator ID with an invoice value other than $0.00 in the current trade month, as indicated in Appendix F, Schedule 1, Part A of this Tariff. Excess GMC costs related to the provision of these services that are not recovered through this charge are allocated to the other GMC service categories as specified above and in Appendix F, Schedule 1, Part E of this Tariff.

8.4 Calculation and Adjustment of the Grid Management Charge

The ~~three~~seven charges set forth in Section 8.3 that comprise the Grid Management Charge shall be calculated through the formula set forth in Appendix F, Schedule 1, Part A of this Tariff. The formula set forth in Appendix F, Schedule 1, Part C of this Tariff sums the Operating Costs (less any available expense recoveries), Financing Costs, and Operating and Capital Reserves Costs associated with each of the seven ISO service charges to obtain a total revenue requirement. This revenue requirement is allocated among the seven charges of the GMC through the application of the factors specified in Appendix F, Schedule 1, Part E of this

Tariff.~~annually by summing the Operating Costs (less any available expense recoveries), Financing Costs, and Operating and Capital Reserves Costs associated with each of the three ISO services, to obtain a total revenue requirement. A separate revenue requirement for each component of the GMC shall be established by dividing the revenue requirement for the ISO as a whole and then assigning such costs to the three service categories.~~ The revenue requirement for each service shall then be divided by the forecast annual or periodic billing determinant volume to obtain a rate for each service, which will be payable by Scheduling Coordinators ~~and Other Appropriate Parties~~ as set forth in Section 8.3. The rates so established ~~may~~will be adjusted annually, through the operation of the formula set forth in Appendix F, Schedule 1, Part A of this Tariff. The ISO shall make an informational~~or over such lesser period as approved by the ISO Governing Board, through a~~ filing with the FERC each year, before the adjusted rates go into effect, as described in Appendix F, Schedule 1, Part D of this Tariff,~~under Section 205 of the Federal Power Act~~ to reflect any change in the annual revenue requirement, variance between forecast and actual costs for the previous year or period, or any surplus revenues from the previous year or period (as defined in Section 8.5), or the inability to recover from a Scheduling Coordinator ~~or Other Appropriate Party~~ its share of the Grid Management Charge, or any under-achievement of a forecast of the billing determinant volumes used to establish the rates. Appendix F, Schedule 1, Part B of this Tariff sets forth the conditions under which a quarterly adjustment to the Grid Management Charge will be made ~~without a filing under Section 205 of the Federal Power Act~~.

8.4.1 Credits and Debits of the Grid Management Charge.

In addition to the adjustments permitted under Section 11.6.3.3, the ISO shall credit or debit, as appropriate, the account of a Scheduling Coordinator ~~or Other Appropriate Party~~ for any overpayment or underpayment of the Grid Management Charge that the ISO determines occurred due to error, omission, or miscalculation by the ISO or the Scheduling Coordinator ~~or Other Appropriate Party~~.

8.5 Operating and Capital Reserves Account.

Revenues collected to fund the ISO financial operating reserves shall be deposited in an Operating and Capital Reserves Account until such account reaches a level specified by the ISO Governing Board. The Operating and Capital Reserves Account shall be calculated separately for each GMC service category (Core Reliability Services, Energy Transmission Services, Forward Scheduling, Congestion Management, Market Usage, and Settlements, Metering and Client Relations). If the Operating and Capital Reserves Account as calculated for such service category is fully funded, surplus funds will be considered an offset to the revenue requirement ~~in~~of the next fiscal year~~'s operating budget~~.

* * *

~~Ancillary Services and Real-Time Energy Operations Charge~~ ~~The component of the Grid Management Charge that provides for the recovery of the ISO's costs of providing ancillary service and real-time energy related services, including, but not limited to:~~

- ~~providing for Ancillary Services and Energy balancing services, including providing for open and non-discriminatory access for market-making activities for participants through auctions;~~
- ~~posting of market information;~~
- ~~market surveillance and analysis; and~~

~~Settlement, billing, and metering related to the above.~~

* * *

Congestion Management Charge The component of the Grid Management Charge that provides for the recovery of the ISO's costs of operating the Congestion Management process, including, but not limited to, the management and operation of inter-zonal congestion markets, adjustment bids, taking Firm Transmission Rights and Existing Contracts into account, and determining the price for mitigating congestion for flows on congested paths. The formula for determining the Congestion Management Charge is set forth in Appendix F, Schedule 1, Part A of this Tariff.

* * *

Control Area Gross Load — For the purpose of calculating and billing ~~the Grid Management Charge,~~ Minimum Load Costs, Emission Costs Charge and Start-Up Fuel Costs Charge, Control Area Gross Load is all Demand for Energy within the ISO Control Area. Control Area Gross Load shall not include Energy consumed by:

(a) generator auxiliary Load equipment that is dedicated to the production of Energy and is electrically connected at the same point as the Generating Unit (*e.g.*, auxiliary Load equipment that is served via a distribution line that is separate from the switchyard to which the Generating Unit is connected will not be considered to be electrically connected at the same point); and

(b) Load that is isolated electrically from the ISO Control Area (*i.e.*, Load that is not synchronized with the ISO Control Area).

~~**Control Area Services Charge**~~ — ~~The component of the Grid Management Charge that provides for recovery of the ISO's costs of ensuring safe, reliable operation of the transmission grid and dispatch of bulk power supplies in accordance with regional and national reliability standards, including, but not limited to:~~

- ~~performing operation studies;~~
- ~~system security analyses;~~
- ~~transmission maintenance standards;~~
- ~~system planning to ensure overall reliability;~~
- ~~integration with other Control Areas;~~
- ~~emergency management;~~
- ~~outage coordination;~~
- ~~transmission planning; and~~
- ~~scheduling generation, imports, exports, and wheeling in the Day-Ahead and Hour-Ahead of actual operations.~~

* * *

Core Reliability Services Charge

The component of the Grid Management Charge that provides for the recovery of the ISO's costs of providing a basic, non-scalable level of reliable operation for the ISO Control Area and meeting regional and national reliability requirements. The formula for determining the Core Reliability Services Charge is set forth in Appendix F, Schedule 1, Part A of this Tariff.

* * *

Energy Transmission Services Net Energy Charge

The component of the Grid Management Charge that provides, in conjunction with the Energy Transmission Services Uninstructed Deviations Charge, for the recovery of the ISO's costs of providing reliability on a scalable basis, i.e., a function of the intensity of the use of the transmission system within the Control Area and the occurrence of system outages and disruptions. The formula for determining the Energy

Transmission Services Net Energy Charge is set forth in Appendix F, Schedule 1, Part A of this Tariff.

Energy Transmission Services Uninstructed Deviations Charge

The component of the Grid Management Charge that provides, in conjunction with the Energy Transmission Services Net Energy Charge, for the recovery of the ISO's costs of providing reliability on a scalable basis, in particular for the costs associated with balancing transmission flows that result from uninstructed deviations. The formula for determining the Energy Transmission Services Uninstructed Deviations Charge is set forth in Appendix F, Schedule 1, Part A of this Tariff.

* * *

Forward Scheduling Charge

The component of the Grid Management Charge that provides for the recovery of the ISO's costs, including, but not limited to the costs of providing the ability to Scheduling Coordinators to forward schedule Energy and Ancillary Services and the cost of processing accepted Ancillary Service bids. For purposes of the Forward Scheduling Charge, a schedule is represented by each Final Hour-Ahead Schedule with a value other than 0 MW submitted to the scheduling infrastructure/scheduling application system (import, export, Load, Generation, inter-SC trade, and Ancillary Services, including self-provided Ancillary Services) submitted to the ISO's scheduling infrastructure. The formula for determining the Forward Scheduling Charge is set forth in Appendix F, Schedule 1, Part A of this Tariff.

* * *

Grid Management Charge

The ISO monthly charge on all Scheduling Coordinators ~~and~~

~~Other Appropriate Parties~~ that provides for the recovery of the ISO's costs listed in Section 8.2 through the ~~three~~seven service charges described in Section 8.3 calculated in accordance with the formula rate set forth in Appendix F, Schedule 1, Part A of this Tariff.~~:~~ The seven charges that comprise the Grid Management Charge consist of: 1) the ~~Control Area~~Core Reliability Services Charge, 2) the ~~Congestion Management~~Energy Transmission Services Net Energy Charge, ~~and~~ 3) the ~~Ancillary Services and Real-Time Energy Operations Charge~~ Energy Transmission Services Uninstructed Deviations Charge, 4) the Forward Scheduling Charge, 5) the Congestion Management Charge, 6) the Market Usage Charge, and 7) the Settlements, Metering, and Client Relations Charge. ~~The three component charges are formula rates.~~

* * *

Market Usage Charge — The component of the Grid Management Charge that provides for the recovery of the ISO's costs, including, but not limited to the costs for processing Supplemental Energy and Ancillary Service bids, maintaining the Open Access Same-Time Information System, monitoring market performance, ensuring generator compliance with market protocols, and determining Market Clearing Prices. The formula for determining the Market Usage Charge is set forth in Appendix F, Schedule 1, Part A of this Tariff.

* * *

Metered Control Area Load

For purposes of calculating and billing the Energy Transmission Services Net Energy Charge component of the Grid Management Charge, Metered Control Area Load is: (a) all metered Demand for Energy of Scheduling Coordinators for the supply of Loads in the ISO's Control Area, plus (b) all Energy for exports by Scheduling Coordinators from the ISO Control Area; less (c) Energy associated with the Load of a retail customer of a Scheduling Coordinator, UDC, or MSS that is served by a Generating Unit that: (i) is located on the same site as the customer's Load or provides service to the customer's Load through arrangements as authorized by Section 218 of the California Public Utilities Code; (ii) is a qualifying small power production facility or qualifying cogeneration facility, as those terms are defined in FERC's regulations implementing Section 201 of the Public Utility Regulatory Policies Act of 1978; and (iii) the customer secures Standby Service from a Participating TO under terms approved by a Local Regulatory Authority or FERC, as applicable, or the customer's Load can be curtailed concurrently with an outage of the Generating Unit.

* * *

~~**Other Appropriate Party**~~

~~A party that may be liable for a component of the ISO Grid Management Charge on a basis other than its role, if any, as Scheduling Coordinator. Such party may include out-of-state or in-state entity that provides real-time power through out-of-market Energy transactions or consumes real-time power through other arrangements over the ISO Controlled Grid; or a~~

~~governmental or municipally-owned entity with Control Area Gross Load not generally served through, but continuously interconnected with, the ISO Controlled Grid.~~

* * *

Settlements, Metering, and Client Relations Charge

The component of the Grid Management Charge that provides for the recovery of the ISO's costs, including, but not limited to the costs of maintaining customer account data, providing account information to customers, responding to customer inquiries, calculating market charges, resolving customer disputes, and the costs associated with the ISO's Settlement, billing, and metering activities. Because this is a fixed charge per Scheduling Coordinator ID, costs associated with activities listed above also are allocated to other charges under the Grid Management Charge according to formula set forth in Appendix F, Schedule 1, Part A of this Tariff.

* * *

ISO TARIFF APPENDIX F

Rate Schedules

Schedule 1

Grid Management Charge

Part A – Monthly Calculation of Grid Management Charge (GMC)

The Grid Management Charge consists of ~~three~~seven separate service charges: (1) the Core Reliability Services Charge, (2) the Energy Transmission Services Net Energy Charge, (3) the Energy Transmission Services Uninstructed Deviations Charge, (4) the Forward Scheduling Charge, (5) the Congestion Management Charge, (6) the Market Usage Charge, and (7) the Settlements, Metering, and Client Relations Charge ~~the Control Area Services Charge, the Congestion Management Charge, and the Ancillary Services and Real-Time Energy Operations Charge~~.

1. The rate in $/MW for the ~~Control Area~~ Core Reliability Services Charge will be calculated by dividing the GMC costs, as determined in accordance with Part C of this Schedule 1, allocated to this service ~~charge~~category in accordance with Part E of this Schedule 1, by the total of the forecasted Scheduling Coordinators' metered non-coincident peak hourly demand in MW for all months during the year. ~~Control Area Gross Load and exports, in MWh.~~

2. The rate in $/MWh for the ~~Congestion Management~~ Energy Transmission Services Net Energy Charge will be calculated by dividing the GMC costs, as determined in accordance with Part C of this Schedule 1, allocated to this service ~~charge~~category in accordance with Part E of this Schedule 1, by the total annual forecast Metered Control~~led Grid~~ Area Load ~~Scheduling Coordinators' inter-zonal scheduled flow (excluding flows pursuant to Existing Contracts) per path~~ in MWh.

3. The rate in $/MWh for the ~~Ancillary Services and Real-Time Energy Operations~~ Energy Transmission Services Uninstructed Deviations Charge will be calculated by dividing the GMC costs, as determined in accordance with Part C of this Schedule 1, allocated to this service ~~charge~~category in accordance with Part E of this Schedule 1, by the absolute value of total annual forecast net uninstructed deviations (netted within a settlement interval) ~~total purchases and sales (including out-of-market transactions) of Ancillary Services, Supplemental Energy, and Imbalance Energy (both instructed and uninstructed)~~ in MWh.

4. The rate in $ per Schedule for the Forward Scheduling Charge will be calculated by dividing the GMC costs, as determined in accordance with Part C of this Schedule 1, allocated to this service category in accordance with Part E of this Schedule 1, by the annual forecast number of non-zero MW Final Hour-Ahead Schedules, including all awarded Ancillary Service bids.

5. The rate in $/MWh for the Congestion Management Charge will be calculated by dividing the GMC costs, as determined in accordance with Part C of this Schedule 1, allocated to this service category in accordance with Part E of this Schedule 1, by the total annual forecast Scheduling Coordinators' inter-zonal scheduled flow (excluding flows pursuant to Existing Contracts) per path in MWh.

6. The rate in $/MWh for the Market Usage Charge will be calculated by dividing the GMC costs, as determined in accordance with Part C of this Schedule 1, allocated to this service category in accordance with Part E of this Schedule 1, by the annual forecast total purchases and sales (including out-of-market transactions) of Ancillary Services, Supplemental Energy, Instructed Imbalance Energy, and net Uninstructed Imbalance Energy (with uninstructed deviations being netted by settlement interval) in MWh.

7. The rate for the Settlements, Metering, and Client Relations Charge will be fixed at $500.00 per month, per Scheduling Coordinator Identification Number ("SC ID") with an invoice value other than $0.00 in the current trade month.

The rates for the foregoing charges shall be adjusted automatically each year, effective January 1 for the following twelve months, in the manner set forth in Part D of this Schedule.

Part B – Quarterly Adjustment, If Required

Each component rate of the Grid Management Charge will be adjusted automatically on a quarterly basis, up or down, so that rates reflect the ~~ISO's FERC approved~~annual revenue requirement as stated in the ISO's annual informational filing, if the estimated billing determinant volumes for that component, on an annual basis, change by 5% or more during the year. Such adjustment may be implemented not more than once per calendar quarter, and will be effective the first day of the next calendar month.

The rates will be adjusted in accordance with the following formula:

According to the formulae listed in Appendix F, Schedule 1, Part A with the billing determinant(s) readjusted on a going-forward basis to reflect the 5% or greater change from the estimated billing determinant provided in the annual informational filing.

~~Each year the Grid Management Charge may be recalculated to reflect the following year's budget estimates and to adjust for any difference between the previous year's revenue and cost estimates and actual revenues and costs, as reflected in Part D of this Schedule, "Information Requirements". The annual or periodic filing (which is described in Part D and is not the quarterly adjustment) shall not affect the automatic adjustment of the Grid Management Charge on a quarterly basis, as set forth in the first paragraph of this Part B.~~

Part C – Costs Recovered through the GMC

As provided in Section 8 of the ISO Tariff, the Grid Management Charge includes the following costs, as projected in the ISO's budget for the year to which the Grid Managment Charge applies:

- Operating costs (as defined in Section 8.2.2)
- Financing costs (as defined in Section 8.2.3), including Start-Up and Development costs and
- Operating and Capital Reserve costs (as defined in Section 8.2.4)

Such costs, for the ISO as a whole, are allocated to the ~~three~~seven service charges that comprise the Grid Management Charge: (1) ~~Control Area~~Core Reliability Services Charge,

(2) ~~Congestion Management~~ Energy Transmission Services Net Energy Charge, ~~and~~

(3) ~~Ancillary Services and Real-Time Energy Operations~~ Energy Transmission Services Uninstructed Deviations Charge, (4) Forward Scheduling Charge, (5) Congestion Management Charge, (6) Market Usage Charge, and (7) Settlements, Metering, and Client Relations Charge, according to the factors listed in Part E of this Schedule 1 ~~using appropriate methodologies~~, and

adjusted annually for:

- any surplus revenues from the previous year as deposited in the Operating and Capital Reserve Account, as defined under Section 8.5, or deficiency of revenues, as recorded in a memorandum account;

divided by:

- forecasted annual billing determinant volumes ~~in MWh~~;

adjusted quarterly for:

- a change in the volume estimate used to calculate the individual Grid Management Charge components, if, on an annual basis, the change is 5% or more.

The Grid Management Charge revenue requirement f~~F~~ormula is as follows:

Grid Management Charge revenue requirement =

- Operating Expenses + Debt Service + [(Coverage Requirement x Senior Lien Debt Service) and/or (Cash Funded Capital Expenditures)] - Interest Earnings - Other Revenues - Reserve Transfer

Where,

- **Operating Expenses =** O&M Expenses plus Taxes Other Than Income Taxes and Penalties
- **O&M Expenses** = Transmission O&M Expenses (Accounts 560-574) plus Customer Accounting Expenses (Accounts 901-905) plus Customer Service and Informational Expenses (Accounts 906-910) plus Sales Expenses (Accounts 911-917) plus Administrative & General Expenses (Accounts 920-935)
- **Taxes Other Than Income Taxes** = those taxes other than income taxes which relate to ISO operating income (Account 408.1)
- **Penalties** = payments by the ISO for penalties or fines incurred for violation of ~~WSCC~~WECC reliability criteria (Account 426.3)
- **Debt Service** = for any fiscal year, scheduled principal and interest payments, sinking fund payments related to balloon maturities, repayment of commercial paper notes, net payments required pursuant to a payment obligation, or payments due on any ISO notes. This amount includes the current year accrued principal and interest payments due in April ~~15~~ of the following year.
- **Coverage Requirement** = 25% of the Senior Lien Debt Service.
- **Senior Lien Debt Service** = all Debt Service that has a first lien on ISO Net Operating Revenues (Account 128 subaccounts).
- **Cash Funded Capital Expenditures** = Post current fiscal year capital additions (Accounts 301-399) funded on a pay-as-you-go basis.
- **Interest Earnings** = Interest earnings on Operating and Capital Reserve balances (Account 419). Interest on bond or note proceeds specifically designated for capital projects or capitalized interest is excluded.
- **Other Revenues** = Amounts booked to Account 456 subaccounts. Such amounts include but are not limited to application fees, ~~WSCC~~WECC security coordinator reimbursements, and fines assessed and collected by the ISO.

- **Reserve Transfer** = the projected reserve balance for December 31 of the prior year less the Reserve Requirement as adopted by the ISO Board and FERC. If such amount is negative, the amount may be divided by two, so that the reserve is replenished within a two-year period. (Account 128 subaccounts)

- **Reserve Requirement** = 15% of Annual Operating Expenses.

A separate r~~R~~evenue r~~R~~equirement shall be established for each component of the Grid Management Charge by developing the r~~R~~evenue r~~R~~equirement for the ISO as a whole and then assigning such costs to the ~~three~~seven service categories using ~~appropriate~~ the allocation ~~methodologies~~factors provided in Appendix F, Schedule 1, Part E of this Tariff.

Part D – Information Requirements

Budget Schedule

The ISO Governing Board shall set forth a budget schedule that shall specify the dates for the budget posting and public workshop events noted below and other significant budget related milestones providing an opportunity for public input.

Budget Posting

The ISO will post on its Internet site the preliminary proposed ISO operating and capital budget to be effective during the subsequent fiscal year, and the projected billing determinant volumes used to develop the rate for each component of the Grid Management Charge.

Public Workshop

Subsequent to the website posting, and prior to (i) the Board approval of the budget and (ii) the submission of the informational filing described in the next paragraph of this Part D, the ISO shall hold a public budget workshop where it will provide an overview of and answer questions from stakeholders on the proposed budget, cost allocation, and the charges for each of the ISO's services for the following year.

Annual ~~or Periodic~~Informational Filing

~~If a change is proposed in the ISO annual revenue requirement from the most recent FERC approved annual revenue requirement, t~~The ISO will make an informational filing ~~under Section 205 of the Federal Power Act~~ each year no later than December 15, or the first business day thereafter, at FERC that shall contain projected cost data on the ISO presented in conformance with the budget approved by the ISO Board and the FERC Uniform System of Accounts (USOA). This filing shall contain such information as is required to ~~set~~update the GMC ~~unit~~ rates resulting from the application of the formulae in Part A of this Schedule for the following ~~fiscal~~calendar year~~ or period, including the criteria used to set the projected billing determinant volumes, and a description of the process used to allocate the ISO's total costs into the revenue requirements for each of the component charges of the GMC~~.

Periodic Financial reports

The ISO will create periodic financial reports consisting of an income statement, balance sheet, statement of operating reserves, and such other reports as are required by the

ISO Board of Governors. The periodic financial reports will be posted on the ISO's Website not less than quarterly.

Part E ~~[Not used]~~**Cost Allocation**

The Grid Management Charge revenue requirement, determined in accordance with Part C of this Schedule 1, shall be allocated to the seven service charges specified in Part A of this Schedule 1 as follows. Expenses projected to be recorded in each cost center shall be allocated among the seven charges in accordance with the allocation factors listed in Table 1 to this Schedule 1. In the event the ISO budgets for projected expenditures for cost centers are not specified in Table 1 to this Schedule, such expenditures shall be allocated based on the allocation factors for the respective ISO division hosting that newly-created cost center. Such divisional allocation factors are specified in Table 1 to this Schedule 1.

Debt service expenditures for the ISO's year 2000 (or subsequently refinanced) bond offering shall be allocated among the seven charges in accordance with the allocation factors listed in Table 1 to this Schedule 1. Capital expenditures shall be allocated among the seven charges in accordance with the allocation factors listed in Table 2 to this Schedule 1 for the system for which the capital expenditure is projected to be made.

Any costs allocated by the factors listed in Table 1 and Table 2 to the Settlements, Metering, and Client Relations category that would remain un-recovered after the assessment of the charge for that service specified in Section 7 of Part A of this Schedule 1 on forecasted billing determinant volumes shall be reallocated to the remaining GMC service categories in the ratios set forth in Table 3 to this Schedule 1.

Costs allocated to the Energy Transmission Services category in the following tables are further apportioned to the Energy Transmission Services Net Energy and Energy Transmission Services Uninstructed Deviations subcategories in 80% and 20% ratios, respectively.

Table 1

O&M, Debt Service, and Other Expense Recoveries Cost Allocation Factors

CC #	Cost Center	CRS	ETS	FS	CM	MU	SMCR	Total
1100	**CEO Division**	**44%**	**22%**	**4%**	**5%**	**10%**	**16%**	**100%**
1111	CEO - General	44%	22%	4%	5%	10%	16%	100%
1241	MD02	7%	0%	14%	11%	28%	40%	100%
1521	Grid Planning	63%	38%	0%	0%	0%	0%	100%
1300	**Finance Division**	**44%**	**21%**	**4%**	**4%**	**10%**	**16%**	**100%**
1311	CFO - General	44%	21%	4%	4%	10%	16%	100%
1321	Accounting	44%	22%	4%	5%	10%	16%	100%
1331	Financial Planning and Treasury	44%	22%	4%	5%	10%	16%	100%
1351	Facilities	44%	21%	4%	4%	10%	17%	100%
1361	Security & Corporate Services	44%	21%	4%	4%	10%	17%	100%

1400	**Information Services Division**	**38%**	**7%**	**10%**	**5%**	**9%**	**31%**	**100%**
1411	Chief Information Officer	38%	7%	10%	5%	9%	31%	100%
1422	Corporate & Enterprise Applications	33%	7%	1%	25%	13%	21%	100%
1424	Asset Management	35%	6%	11%	5%	11%	32%	100%
1431	End User Support	38%	14%	8%	3%	9%	27%	100%
1432	Computer Operations and Infrastructure Services	34%	9%	12%	3%	9%	33%	100%
1433	Network Services	43%	12%	9%	3%	9%	24%	100%
1441	Outsourced Contracts	42%	11%	10%	3%	9%	25%	100%
1442	Production Support	25%	0%	18%	3%	8%	47%	100%
1451	Information Support Services	25%	0%	18%	3%	8%	47%	100%
1461	Control Systems	96%	2%	0%	0%	1%	1%	100%
1462	Field Data Acquisition System (FDAS)	21%	0%	0%	0%	0%	79%	100%
1463	Operations Systems Services	50%	3%	6%	1%	6%	33%	100%
1466	Enterprise Applications	48%	7%	1%	1%	3%	39%	100%
1467	Settlement Systems Services	27%	11%	2%	2%	5%	52%	100%
1468	Corporate Application Support and Administration	44%	21%	4%	4%	10%	17%	100%
1469	Analytical and Reporting Applications	10%	0%	0%	65%	25%	0%	100%
1471	IT Planning	25%	0%	18%	3%	8%	47%	100%
1481	Markets and Scheduling System Services	47%	3%	24%	3%	18%	6%	100%
1482	Market Systems Support Services	45%	1%	19%	6%	24%	6%	100%
1500	**Grid Operations Division**	**67%**	**33%**	**0%**	**0%**	**0%**	**0%**	**100%**
1511	VP Grid Operations	67%	33%	0%	0%	0%	0%	100%
1542	Outage Coordination	95%	5%	0%	0%	0%	0%	100%
1543	Loads and Resources	49%	51%	0%	0%	0%	0%	100%
1544	Real-Time Scheduling	60%	40%	0%	0%	0%	0%	100%
1545	Grid Operations	67%	33%	0%	0%	0%	0%	100%
1546	Security Coordination	100%	0%	0%	0%	0%	0%	100%
1547	Engineering and Maintenance	46%	54%	0%	0%	0%	0%	100%
1548	OSAT Group - General	93%	7%	0%	0%	0%	0%	100%
1549	Operations Training	50%	50%	0%	0%	0%	0%	100%
1554	Special Projects	43%	57%	0%	0%	0%	0%	100%

	Engineering							
1555	Operations Support Group	56%	44%	0%	0%	0%	0%	100%
1558	Transmission Maintenance	58%	42%	0%	0%	0%	0%	100%
1559	Operations Application Support	60%	40%	0%	0%	0%	0%	100%
1561	Operations Engineering South	65%	35%	0%	0%	0%	0%	100%
1562	Operations Engineering North	55%	45%	0%	0%	0%	0%	100%
1563	Operations Coordination	75%	25%	0%	0%	0%	0%	100%
1564	Operations Scheduling	100%	0%	0%	0%	0%	0%	100%
1565	Pre-Scheduling and Support	77%	23%	0%	0%	0%	0%	100%
1566	Regional Coordination - General	100%	0%	0%	0%	0%	0%	100%
1600	**Legal and Regulatory Division**	**36%**	**22%**	**4%**	**7%**	**17%**	**15%**	**100%**
1611	VP General Counsel - General	36%	22%	4%	7%	17%	15%	100%
1631	Legal and Regulatory	44%	22%	4%	5%	10%	16%	100%
1641	Market Analysis	15%	26%	0%	20%	31%	7%	100%
1642	Market Surveillance Committee	25%	25%	0%	25%	25%	0%	100%
1651	Board of Governors	44%	22%	4%	5%	10%	16%	100%
1661	Compliance - General	22%	20%	12%	0%	29%	17%	100%
1662	Compliance - Audits	8%	0%	0%	0%	50%	42%	100%
1700	**Market Services Division**	**17%**	**2%**	**9%**	**9%**	**20%**	**41%**	**100%**
1711	VP Market Services - General	17%	2%	9%	9%	20%	41%	100%
1721	Billing and Settlements-General	25%	0%	0%	0%	0%	75%	100%
1722	Business Development Support	0%	0%	0%	0%	0%	100%	100%
1723	RMR Settlements	80%	20%	0%	0%	0%	0%	100%
1724	BBS - PSS	0%	0%	0%	0%	0%	100%	100%
1725	BBS - FSS	0%	0%	0%	0%	0%	100%	100%
1731	Contracts and Special Projects	43%	7%	0%	0%	0%	50%	100%
1741	Client Relations	0%	0%	0%	0%	0%	100%	100%
1751	Market Operations - General	31%	0%	15%	15%	35%	4%	100%
1752	Manager of Markets	27%	5%	27%	22%	18%	0%	100%
1753	Market Engineering	21%	0%	0%	28%	43%	7%	100%
1755	Business Solutions	6%	0%	47%	12%	29%	6%	100%

1756	Market Quality - General	0%	0%	0%	0%	71%	29%	100%
1757	Market Integration	7%	0%	30%	30%	26%	7%	100%
1800	**Corporate and Strategic Development Division**	**44%**	**21%**	**4%**	**4%**	**10%**	**16%**	**100%**
1811	VP Corporate and Strategic Development - General	44%	21%	4%	4%	10%	16%	100%
1821	Communications	44%	22%	4%	5%	10%	16%	100%
1831	Strategic Development	44%	22%	4%	5%	10%	16%	100%
1841	Human Resources	44%	21%	4%	4%	10%	17%	100%
1851	Project Office	44%	22%	4%	5%	10%	16%	100%
1861	Regulatory Policy	44%	22%	4%	5%	10%	16%	100%
Other Revenue and Credits								
	SC Application and Training Fees	0%	0%	0%	0%	0%	100%	100%
	WECC Reimbursement/NERC Reimbursement	100%	0%	0%	0%	0%	0%	100%
	Interest Earnings	37%	12%	9%	5%	11%	25%	100%
Debt Service Related Allocations		33%	8%	15%	5%	9%	29%	100%

Table 2

Capital Cost Allocation Factors

System	**CRS**	**ETS**	**FS**	**CM**	**MU**	**SMCR**	**Total**
ACC Upgrades (Communication between ISO & IOUs)	100%	0%	0%	0%	0%	0%	100%
Ancillary Services Management (ASM) Component of SA	15%	0%	40%	0%	45%	0%	100%
Application Development Tools	23%	0%	22%	3%	7%	45%	100%
Automated Dispatch System (ADS)	50%	0%	25%	0%	20%	5%	100%
Automated Load Forecast System (ALFS)	70%	0%	10%	0%	20%	0%	100%
Automatic Mitigation Procedure (AMP)	85%	0%	0%	0%	15%	0%	100%

Backup systems (Legato/Quantum)	23%	0%	22%	3%	7%	45%	100%
Balance of Business Systems (BBS)	0%	0%	0%	0%	0%	100%	100%
Balancing Energy Ex Post Price (BEEP) Component of SA	50%	0%	20%	10%	20%	0%	100%
Bill's Interchange Schedule (BITS)	85%	0%	0%	0%	15%	0%	100%
CaseWise (process modeling tool)	44%	21%	4%	4%	10%	17%	100%
CHASE	44%	21%	4%	4%	10%	17%	100%
Common Information Model (CIM)	100%	0%	0%	0%	0%	0%	100%
Compliance (Blaze)	19%	16%	10%	0%	33%	22%	100%
Congestion Management (CONG) (Component of SA)	10%	0%	0%	65%	25%	0%	100%
Congestion Reform-DSOW	50%	0%	0%	50%	0%	0%	100%
Congestion Revenue Rights (CRR)	0%	0%	0%	80%	20%	0%	100%
DataWarehouse	24%	18%	6%	9%	24%	18%	100%
Dept. of Market Analysis Tools (SAS/MARS)	15%	26%	0%	20%	31%	7%	100%
Dispute Tracking System (Remedy)	0%	0%	0%	0%	0%	100%	100%
Documentum	44%	21%	4%	4%	10%	17%	100%
Electronic Tagging (Etag)	100%	0%	0%	0%	0%	0%	100%
Energy Management System (EMS)	100%	0%	0%	0%	0%	0%	100%
Engineering Analysis Tools	60%	40%	0%	0%	0%	0%	100%
Evaluation of Market Separation	0%	0%	0%	50%	50%	0%	100%
Existing Transmission Contracts Calculator (ETCC)	25%	0%	20%	15%	20%	20%	100%
FERC Study Software	0%	0%	0%	0%	100%	0%	100%

Firm Transmission Right (FTR) and Secondary Registration System (SRS)	0%	0%	15%	60%	15%	10%	100%
Global Resource Reliability Management Application (GRRMA)	75%	15%	0%	0%	10%	0%	100%
Grid Operations Training Simulator (GOTS)	56%	44%	0%	0%	0%	0%	100%
Hour-Ahead Data AnalysisTool, Day-Ahead Data AnalysisTool,	0%	0%	100%	0%	0%	0%	100%
Human Resources	44%	21%	4%	4%	10%	17%	100%
IBM Contract	37%	14%	10%	4%	9%	26%	100%
Integrated Forward Market (IFM)	10%	0%	35%	0%	55%	0%	100%
Internal Development	23%	0%	22%	3%	7%	45%	100%
Interzonal Congestion Management reform - Real Time	50%	0%	0%	50%	0%	0%	100%
Land and Building Costs	44%	21%	4%	4%	10%	17%	100%
Local Area Network (LAN)	44%	21%	4%	4%	10%	17%	100%
Locational Marginal Pricing (LMPM)	10%	0%	35%	0%	55%	0%	100%
Market Transaction System (MTS)	0%	0%	0%	0%	100%	0%	100%
Masterfile	20%	0%	20%	0%	55%	5%	100%
MD02 Capital	7%	0%	14%	11%	28%	40%	100%
Meter Data Acquisition System (MDAS)	0%	0%	0%	0%	0%	100%	100%
Miscellaneous (2004 related projects)	23%	0%	22%	3%	7%	45%	100%
Monitoring (Tivoli)	23%	0%	22%	3%	7%	45%	100%
New Resource Interconnection (NRI)	100%	0%	0%	0%	0%	0%	100%
New System Equipment (replacement of owned equipment)	23%	0%	22%	3%	7%	45%	100%
NT/web servers	44%	21%	4%	4%	10%	17%	100%

NT-servers	44%	21%	4%	4%	10%	17%	100%
Oracle Enterprise Manager (OEM)	27%	0%	18%	5%	9%	41%	100%
Office Automation - desktop/laptop (OA)	44%	21%	4%	4%	10%	17%	100%
Office equipment (scanner, printer, copier, fax, Communication Equipment)	44%	21%	4%	4%	10%	17%	100%
Open Access Same Time Information System (OASIS)	10%	0%	25%	10%	35%	20%	100%
Operational Meter Analysis and Reporting (OMAR)	0%	0%	0%	0%	0%	100%	100%
Oracle Corporate Financials	44%	21%	4%	4%	10%	17%	100%
Oracle Licenses	27%	0%	18%	5%	9%	41%	100%
Oracle Market Financials BBS	0%	0%	0%	0%	0%	100%	100%
Out of Sequence Market Operation Settlements Information System (OOS)	5%	5%	0%	0%	90%	0%	100%
Outage Scheduler (OS)	50%	0%	10%	20%	20%	0%	100%
Participating Intermittent Resource Project (PIRP)	0%	0%	94%	0%	6%	0%	100%
Physical Facilities Software Application/Furniture/Leasehold Improvements	44%	21%	4%	4%	10%	17%	100%
Process Information System (PI)	80%	0%	0%	0%	10%	10%	100%
Rational Buyer	100%	0%	0%	0%	0%	0%	100%
Real Time Energy Dispatch System (REDS)	100%	0%	0%	0%	0%	0%	100%
Real Time Nodal Market	35%	0%	10%	0%	55%	0%	100%
Reliability Management System (RMS)	100%	0%	0%	0%	0%	0%	100%
Remedy (related to Transmission Registry, New Resource Interconnection, and Resource Registry)	100%	0%	0%	0%	0%	0%	100%
Remote Intelligent Gateway (RIG) & Data Processing Gateway (DPG)	100%	0%	0%	0%	0%	0%	100%

Resource Register (RR)	100%	0%	0%	0%	0%	0%	100%
RMR Application Validation Engine (RAVE)	100%	0%	0%	0%	0%	0%	100%
Scheduling & Logging for ISO California (SLIC)	65%	0%	15%	5%	15%	0%	100%
Scheduling Architecture (SA)	24%	0%	20%	26%	30%	0%	100%
Scheduling Infrastructure (SI)	0%	0%	94%	0%	6%	0%	100%
Scheduling Infrastructure Business Rules (SIBR)	0%	0%	94%	0%	6%	0%	100%
Security Constrained Economic Dispatch (SCED)	40%	0%	0%	0%	60%	0%	100%
Security- External/Physical	44%	21%	4%	4%	10%	17%	100%
Security-ISS (CUDA)	23%	0%	22%	3%	7%	45%	100%
Settlements and Market Clearing	0%	0%	0%	0%	0%	100%	100%
Sign Board (Symon Board maint.)	44%	21%	4%	4%	10%	17%	100%
Startup Costs through 3/31/98, Working Capital-3 months	44%	21%	4%	4%	10%	17%	100%
Storage (EMC symmetrix)	19%	10%	14%	4%	12%	42%	100%
System Equipment Buyouts (lease buyouts)	43%	1%	7%	2%	11%	36%	100%
Telephone/PBX	44%	21%	4%	4%	10%	17%	100%
Training Systems	23%	0%	22%	3%	7%	45%	100%
Transmission Constrained Unit Commitment (TCUC) Must Offer Obligation	100%	0%	0%	0%	0%	0%	100%
Transmission Map Plotting & Display	50%	50%	0%	0%	0%	0%	100%
Trustee Costs, Interest-Capitalized, User Groups	54%	1%	11%	16%	17%	2%	100%
Utilities - System i.e. Print drivers	23%	0%	22%	3%	7%	45%	100%
Vitria (Middleware)	23%	0%	22%	3%	7%	45%	100%

Wide Area Network (WAN)	41%	2%	19%	1%	8%	29%	100%
Capital Expenditures for Systems not Specified	32%	7%	15%	6%	11%	29%	100%

Table 3

Reallocation Factors for Projected Unrecovered Portion of Settlements, Metering, and Client Relations Revenue Requirement

	CRS	ETS	FS	CM	MU	SMCR	Total
Functional Association of Settlements, Metering, and Client Relations	0.0%	70.3%	0.0%	8.2%	21.4%	0.0%	100.0%

* * *

SETTLEMENT AND BILLING PROTOCOL (SABP)

* * *

SABP 3.1 Description of Charges to be Settled

The ISO shall, based on the Settlement Quality Meter Data it has received, or, if Settlement Quality Meter Data is not available, based on the best available information or estimate it has received, calculate the following:

(a) the amount due from each Scheduling Coordinator ~~or Other Appropriate Party~~ for its share for the relevant month of the ~~three~~seven components of the Grid Management Charge in accordance with the formula located in Appendix F, Schedule 1, Part A of this Tariff. These Charges shall accrue on a monthly basis.

(b) the amount due from each Scheduling Coordinator for the Grid Operations Charge in accordance with Appendix ~~A~~F, Schedule 2 of this Tariff. This charge shall accrue on a monthly basis.

(c) the amount due from and/or owed to each Scheduling Coordinator for the Charge for each Ancillary Service in accordance with Appendix C, for each of the Settlement Periods of Day 0.

(d) the amount due from and/or owed to each Scheduling Coordinator for Imbalance Energy in accordance with Appendix D, for each of the Settlement Periods of Day 0.

(e) the amount due from and/or owed to each Scheduling Coordinator for Usage Charges in accordance with Appendix E, for each of the Settlement Periods of Day 0.

(f) the amount due from each Scheduling Coordinator for Wheeling Out and Wheeling Through Charges and the amount owed to each Participating TO for these charges in accordance with Appendix F, for each of the Settlement Periods of Day 0.

(g) the amounts due from/to Scheduling Coordinators for Voltage Support (supplemental reactive power charges) for each of the Settlement Periods of Day 0 in accordance with Appendix G.

(h) the monthly charges due from/to Scheduling Coordinators for long term voltage support provided by Owners of Reliability Must-Run Units in accordance with Appendix G.

(i) the amounts due from/to Scheduling Coordinators for the provision of Black Start Energy from Reliability Must-Run Units for each of the Settlement Periods of Day 0 in accordance with Appendix G.

(j) the amounts due from/to Black Start Generators for the provision of Black Start Energy for each of the Settlement Periods of Day 0 in accordance with Appendix G.

(k) the amount due from each UDC or MSS, or from a Scheduling Coordinator delivering Energy for the supply of Gross Load not directly connected to the facilities of a UDC or MSS, for the High Voltage Access Charge and Transition Charge in accordance with operating procedures posted on the ISO Home Page. These charges shall accrue on a monthly basis.

(l) the amounts due from Scheduling Coordinators for FERC Annual Charges.

All of the data, information, and estimates the ISO uses to calculate these amounts shall be subject to the auditing requirements of Section 10.5 of the ISO Tariff.

The ISO shall calculate these amounts using the software referred to in SABP 2.1 except in cases of system breakdown when it shall apply the procedures set out in SABP 9 (Emergency Procedures).

* * *

SABP 3.2.1 Settlement of Payments to/from Scheduling Coordinators and Participating TOs

The ISO will calculate for each charge the amounts payable by the relevant Scheduling Coordinator, Black Start Generator or Participating TO for each Settlement Period of the Trading Day, and the amounts payable to that Scheduling Coordinator, Black Start Generator or Participating TO for each charge for each Settlement Period of that Trading Day and shall arrive at a net amount payable for each charge by or to that Scheduling Coordinator, Black Start Generator or Participating TO for each charge for that Trading Day. Each of these amounts will appear in the Preliminary and Final Settlement Statements that the ISO will provide to the relevant Scheduling Coordinator, Black Start Generator or Participating TO as provided in SABP 4.

The ~~three~~seven components of the Grid Management Charge will be included in the Preliminary Settlement Statement and Final Settlement

Statement with the other types of charges referred to in SABP 3.1, but a separate invoice for the Grid Management Charge, stating the rate, billing determinant volume, and total charge for each of its ~~three~~seven components, will be issued by the ISO to the Scheduling Coordinator ~~or Other Appropriate Party~~.

* * *

SABP 5 INVOICES

The ISO shall provide on the day specified in the ISO Payments Calendar an invoice in the format set out in SABP Appendix I showing:

(a) amounts which according to each of the Preliminary and Final Settlement Statements of that Billing Period are to be paid from or to each Scheduling Coordinator, ~~Other Appropriate Party,~~ Black Start Generator or Participating TO;

(b) the Payment Date, being the date on which such amounts are to be paid or received and the time for such payment; and

(c) details (including the account number, bank name and Fed-Wire transfer instructions) of the ISO Clearing Account to which any amounts owed by the Scheduling Coordinator, Black Start Generator or Participating TO are to be paid.

A separate invoice for the Grid Management Charge, stating the rate, billing determinant volume, and total charge for each of its ~~three~~seven components, will be issued by the ISO to the Scheduling Coordinator ~~or Other Appropriate Party~~.

A separate invoice for Interest, issued on the preliminary invoice date, stating the total charges for each Trade Month in which interest is charged, will be issued by the ISO.

* * *

SABP 6.5.3 Distribution of Funds

In the event that there are funds in the ISO Surplus Account in excess of an amount to be determined by the ISO Governing Board and noticed by the ISO to Market Participants, the amount of such excess will be distributed to Scheduling Coordinators ~~and Other Appropriate Parties~~ using the same method of apportioning the refund as the method employed in apportioning the liability for the Grid Management Charge.

* * *

APPENDIX A [Not Used]

~~GRID MANAGEMENT CHARGE COMPUTATION~~

~~The Grid Management Charge will be calculated in the following manner, with the numerator of each of the equations listed below being determined as a percentage of the total ISO budget, and the denominator (billing determinant volume) for each formula being an estimated annual value:~~

~~= Costs recovered through the Control Area Services Charge / Control Area Gross Load and exports (MWh) = RATE in $/MWh~~

~~GMC Costs = Costs recovered through the Congestion Management Charge = RATE in $/MWh~~
~~total Scheduling Coordinators' inter-zonal scheduled flow (excluding Flows pursuant to Existing Contracts) per path (MWh)~~

~~= Costs recovered through the Ancillary Services and Real-Time Energy Operations Charge = RATE in $/MWh~~
~~total purchases and sales Ancillary Services, Supplemental Energy and Imbalance Energy (both instructed and uninstructed) (MWh)~~

* * *

Year	Charge Type	Charge Description	No of Transactions	CAS Share	CONG Share	MS Share	CAS Amount	CONG Amount	MS Amount
2001	1	Day Ahead Spinning Reservedue SC	1937	75.0%	0.0%	25.0%	1,453	0	484
2001	2	Day Ahead Non-Spinning Reservedue SC	1708	75.0%	0.0%	25.0%	1,281	0	427
2001	4	Day Ahead Replacement Reservedue SC	1235	75.0%	0.0%	25.0%	926	0	309
2001	5	Day Ahead Regulation Up due SC	1533	75.0%	0.0%	25.0%	1,150	0	383
2001	6	Day Ahead Regulation Down due SC	1731	75.0%	0.0%	25.0%	1,298	0	433
2001	7	Demand Relief Monthly Capacity Payment	24	75.0%	0.0%	25.0%	18	0	6
2001	24	Dispatched Replacement Reserve (Bid-In) Capacity Withhold	78	75.0%	0.0%	25.0%	59	0	20
2001	51	Hour Ahead Spinning Reservedue SC	2084	75.0%	0.0%	25.0%	1,563	0	521
2001	52	Hour Ahead Non-Spinning Reserve due SC	1656	75.0%	0.0%	25.0%	1,242	0	414
2001	54	Hour Ahead Replacement Reservedue SC	1251	75.0%	0.0%	25.0%	938	0	313
2001	55	Hour Ahead Regulation Up due SC	1515	75.0%	0.0%	25.0%	1,136	0	379
2001	56	Hour Ahead Regulation Down due SC	1644	75.0%	0.0%	25.0%	1,233	0	411
2001	71	Real Time RMR Preemption of Spinning Reserve (DA Price)	2	100.0%	0.0%	0.0%	2	0	0
2001	72	Real Time RMR Preemption of Non-Spinning Reserve (DA Price)	5	100.0%	0.0%	0.0%	5	0	0
2001	81	Real Time RMR Preemption of Spinning Reserve (HA Price)	1	100.0%	0.0%	0.0%	1	0	0
2001	82	Real Time RMR Preemption of Non-Spinning Reserve (HA Price)	1	100.0%	0.0%	0.0%	1	0	0
2001	84	Real Time RMR Preemption of Replacement Reserve (HA Price)	1	100.0%	0.0%	0.0%	1	0	0
2001	111	Spinning Reserve due ISO	14600	75.0%	0.0%	25.0%	10,950	0	3,650
2001	112	Non-Spinning Reserve due ISO	14434	75.0%	0.0%	25.0%	10,826	0	3,609
2001	114	Replacement Reserve due ISO	12577	75.0%	0.0%	25.0%	9,433	0	3,144
2001	115	Regulation Up Due ISO	13882	75.0%	0.0%	25.0%	10,412	0	3,471
2001	116	Regulation Down Due ISO	14988	75.0%	0.0%	25.0%	11,241	0	3,747
2001	117	Demand Relief Monthly Capacity Charge	400	0.0%	0.0%	100.0%	0	0	400
2001	124	Dispatched Replacement Reserve (Self-Provided) Capacity Withhold	2	100.0%	0.0%	0.0%	2	0	0
2001	141	No Pay Charge - Spinning Reserve	1431	100.0%	0.0%	0.0%	1,431	0	0
2001	142	No Pay Charge - Non Spinning Reserve	965	100.0%	0.0%	0.0%	965	0	0
2001	144	No Pay Charge - Replacement Reserve	504	100.0%	0.0%	0.0%	504	0	0
2001	145	Non Compliance Charge for Regulation Up	1213	100.0%	0.0%	0.0%	1,213	0	0
2001	146	Non Compliance Charge for Regulation Down	1331	100.0%	0.0%	0.0%	1,331	0	0
2001	203	Day-Ahead Inter-Zonal Congestion Settlement	7891	0.0%	100.0%	0.0%	0	7,891	0
2001	204	due TO	1805	0.0%	100.0%	0.0%	0	1,805	0
2001	253	Hour-Ahead Inter-Zonal Congestion	6971	0.0%	100.0%	0.0%	0	6,971	0
2001	254	due TO	1689	0.0%	100.0%	0.0%	0	1,689	0

Year	Charge Type	Charge Description	No of Transactions	CAS Share	CONG Share	MS Share	CAS Amount	CONG Amount	MS Amount
2001	255	Hour-Ahead Inter-Zonal Congestion Debit to TOs	140	0.0%	100.0%	0.0%	0	140	0
2001	256	Hour-Ahead Inter-Zonal Congestion Debit to SCs	649	0.0%	100.0%	0.0%	0	649	0
2001	302	Supplemental Reactive Power Due SC	15	100.0%	0.0%	0.0%	15	0	0
2001	372	High Voltage Access Charge due ISO	94	100.0%	0.0%	0.0%	94	0	0
2001	374	High Voltage Access Revenue due PTO	93	100.0%	0.0%	0.0%	93	0	0
2001	382	High Voltage Wheeling Charge due ISO	427	100.0%	0.0%	0.0%	427	0	0
2001	383	Low Voltage Wheeling Charge due ISO	78	100.0%	0.0%	0.0%	78	0	0
2001	384	High Voltage Wheeling Revenue due TO	66	100.0%	0.0%	0.0%	66	0	0
2001	385	Low Voltage Wheeling Revenue due TO	33	100.0%	0.0%	0.0%	33	0	0
2001	401	Instructed Energy	4452	75.0%	0.0%	25.0%	3,339	0	1,113
2001	406	SC Unaccounted for Energy (UFElogical)	16048	75.0%	0.0%	25.0%	12,036	0	4,012
2001	407	Uninstructed Energy	17218	75.0%	0.0%	25.0%	12,914	0	4,305
2001	410	Unscheduled RMR Energy	291	75.0%	0.0%	25.0%	218	0	73
2001	481	Excess Cost for Instructed Energy	1828	75.0%	0.0%	25.0%	1,371	0	457
2001	487	Allocation of Excess Cost for Instructed Energy	20045	75.0%	0.0%	25.0%	15,034	0	5,011
2001	521	GMC-Control Area Services	585	100.0%	0.0%	0.0%	585	0	0
2001	522	GMC-Congestion Management	533	0.0%	100.0%	0.0%	0	533	0
2001	523	Market Operations Grid Management Charge	839	0.0%	0.0%	100.0%	0	0	839
2001	550	FERC Fee	569	100.0%	0.0%	0.0%	569	0	0
2001	591	Emissions Cost Recovery	283	100.0%	0.0%	0.0%	283	0	0
2001	592	Start-Up Cost Recovery	278	100.0%	0.0%	0.0%	278	0	0
2001	593	Emissions Cost Due Trustee	14	100.0%	0.0%	0.0%	14	0	0
2001	594	Start-Up Cost Due Trustee	58	100.0%	0.0%	0.0%	58	0	0
2001	595	Minimum Load Cost Allocation Due ISO	476	100.0%	0.0%	0.0%	476	0	0
2001	692	Start-Up Cost Payment	22	100.0%	0.0%	0.0%	22	0	0
2001	695	Minimum Load Cost Compensation Due SC	38	100.0%	0.0%	0.0%	38	0	0
2001	1010	Neutrality Adjustments	22026	75.0%	0.0%	25.0%	16,520	0	5,507
2001	1011	Ancillary Service Rational Buyer Adjustment	18188	75.0%	0.0%	25.0%	13,641	0	4,547
2001	1030	No Pay Provision Market Refund	20062	75.0%	0.0%	25.0%	15,047	0	5,016
2001	1061	Distribution of Preempted Spinning Reserve	36	100.0%	0.0%	0.0%	36	0	0
2001	1062	Distribution of Preempted Non-Spinning Reserve	182	100.0%	0.0%	0.0%	182	0	0
2001	1064	Distribution of Preempted Replacement Reserve	219	100.0%	0.0%	0.0%	219	0	0
2001	1120	Est. Summer Reliab. Contract Capacity Pymt/Charge	598	100.0%	0.0%	0.0%	598	0	0

Year	Charge Type	Charge Description	No of Transactions	CAS Share	CONG Share	MS Share	CAS Amount	CONG Amount	MS Amount
2001	1121	Adj. Summer Reliab. Contract Capacity Pymt/Charge	1046	100.0%	0.0%	0.0%	1,046	0	0
2001	1210	Existing Contracts Cash Neutrality Charge/Refund	24946	75.0%	0.0%	25.0%	18,710	0	6,237
2001	1302	due ISO	507	100.0%	0.0%	0.0%	507	0	0
2001	1487	Energy Exchange Program Neutrality Adjustment	3	75.0%	0.0%	25.0%	2	0	1
2001	1999	Rounding Adjustment	475	69.2%	9.3%	21.4%	329	44	102
2001	2999	Interest - Due SC	151	69.2%	9.3%	21.4%	105	14	32
2001	3999	Interest and Penalty Charge - Due ISO	492	69.2%	9.3%	21.4%	341	46	105
2002	1	Day Ahead Spinning Reservedue SC	1914	75.0%	0.0%	25.0%	1,436	0	479
2002	2	Day Ahead Non-Spinning Reservedue SC	1334	75.0%	0.0%	25.0%	1,001	0	334
2002	4	Day Ahead Replacement Reservedue SC	312	75.0%	0.0%	25.0%	234	0	78
2002	5	Day Ahead Regulation Up due SC	1891	75.0%	0.0%	25.0%	1,418	0	473
2002	6	Day Ahead Regulation Down due SC	1981	75.0%	0.0%	25.0%	1,486	0	495
2002	24	Dispatched Replacement Reserve (Bid-In) Capacity Withhold	137	75.0%	0.0%	25.0%	103	0	34
2002	51	Hour Ahead Spinning Reservedue SC	2430	75.0%	0.0%	25.0%	1,823	0	608
2002	52	Hour Ahead Non-Spinning Reserve due SC	2007	75.0%	0.0%	25.0%	1,505	0	502
2002	54	Hour Ahead Replacement Reservedue SC	752	75.0%	0.0%	25.0%	564	0	188
2002	55	Hour Ahead Regulation Up due SC	2081	75.0%	0.0%	25.0%	1,561	0	520
2002	56	Hour Ahead Regulation Down due SC	2093	75.0%	0.0%	25.0%	1,570	0	523
2002	61	Hour Ahead RMR Preemption of Spinning Reserve (HA Price)	4	100.0%	0.0%	0.0%	4	0	0
2002	65	Hour Ahead RMR Preemption of Regulation Up (HA Price)	1	100.0%	0.0%	0.0%	1	0	0
2002	66	Hour Ahead RMR Preemption of Regulation Down (HA Price)	1	100.0%	0.0%	0.0%	1	0	0
2002	71	Real Time RMR Preemption of Spinning Reserve (DA Price)	82	100.0%	0.0%	0.0%	82	0	0
2002	72	Real Time RMR Preemption of Non-Spinning Reserve (DA Price)	183	100.0%	0.0%	0.0%	183	0	0
2002	81	Real Time RMR Preemption of Spinning Reserve (HA Price)	18	100.0%	0.0%	0.0%	18	0	0
2002	82	Real Time RMR Preemption of Non-Spinning Reserve (HA Price)	15	100.0%	0.0%	0.0%	15	0	0
2002	84	Real Time RMR Preemption of Replacement Reserve (HA Price)	3	100.0%	0.0%	0.0%	3	0	0
2002	111	Spinning Reserve due ISO	11805	75.0%	0.0%	25.0%	8,854	0	2,951
2002	112	Non-Spinning Reserve due ISO	11743	75.0%	0.0%	25.0%	8,807	0	2,936
2002	114	Replacement Reserve due ISO	10492	75.0%	0.0%	25.0%	7,869	0	2,623
2002	115	Regulation Up Due ISO	11295	75.0%	0.0%	25.0%	8,471	0	2,824
2002	116	Regulation Down Due ISO	11375	75.0%	0.0%	25.0%	8,531	0	2,844
2002	124	Dispatched Replacement Reserve (Self-Provided) Capacity Withhold	5	100.0%	0.0%	0.0%	5	0	0
2002	141	No Pay Charge - Spinning Reserve	1506	100.0%	0.0%	0.0%	1,506	0	0

Year	Charge Type	Charge Description	No of Transactions	CAS Share	CONG Share	MS Share	CAS Amount	CONG Amount	MS Amount
2002	142	No Pay Charge - Non Spinning Reserve	725	100.0%	0.0%	0.0%	725	0	0
2002	144	No Pay Charge - Replacement Reserve	110	100.0%	0.0%	0.0%	110	0	0
2002	145	Non Compliance Charge for Regulation Up	1382	100.0%	0.0%	0.0%	1,382	0	0
2002	146	Non Compliance Charge for Regulation Down	1432	100.0%	0.0%	0.0%	1,432	0	0
2002	203	Day-Ahead Inter-Zonal Congestion Settlement	7652	0.0%	100.0%	0.0%	0	7,652	0
2002	204	due TO	2984	0.0%	100.0%	0.0%	0	2,984	0
2002	253	Hour-Ahead Inter-Zonal Congestion	5860	0.0%	100.0%	0.0%	0	5,860	0
2002	254	due TO	2106	0.0%	100.0%	0.0%	0	2,106	0
2002	255	Hour-Ahead Inter-Zonal Congestion Debit to TOs	591	0.0%	100.0%	0.0%	0	591	0
2002	256	Hour-Ahead Inter-Zonal Congestion Debit to SCs	1344	0.0%	100.0%	0.0%	0	1,344	0
2002	302	Supplemental Reactive Power Due SC	12	100.0%	0.0%	0.0%	12	0	0
2002	372	High Voltage Access Charge due ISO	80	100.0%	0.0%	0.0%	80	0	0
2002	374	High Voltage Access Revenue due PTO	64	100.0%	0.0%	0.0%	64	0	0
2002	382	High Voltage Wheeling Charge due ISO	392	100.0%	0.0%	0.0%	392	0	0
2002	383	Low Voltage Wheeling Charge due ISO	72	100.0%	0.0%	0.0%	72	0	0
2002	384	High Voltage Wheeling Revenue due TO	69	100.0%	0.0%	0.0%	69	0	0
2002	385	Low Voltage Wheeling Revenue due TO	40	100.0%	0.0%	0.0%	40	0	0
2002	401	Instructed Energy	4675	75.0%	0.0%	25.0%	3,506	0	1,169
2002	406	SC Unaccounted for Energy (UFElogical)	15835	75.0%	0.0%	25.0%	11,876	0	3,959
2002	407	Uninstructed Energy	18115	75.0%	0.0%	25.0%	13,586	0	4,529
2002	410	Unscheduled RMR Energy	202	75.0%	0.0%	25.0%	152	0	51
2002	481	Excess Cost for Instructed Energy	515	75.0%	0.0%	25.0%	386	0	129
2002	487	Allocation of Excess Cost for Instructed Energy	5470	75.0%	0.0%	25.0%	4,103	0	1,368
2002	521	GMC-Control Area Services	985	100.0%	0.0%	0.0%	985	0	0
2002	522	GMC-Congestion Management	1004	0.0%	100.0%	0.0%	0	1,004	0
2002	524	GMC-A/S and RT Energy Operations	794	0.0%	0.0%	100.0%	0	0	794
2002	550	FERC Fee	654	100.0%	0.0%	0.0%	654	0	0
2002	591	Emissions Cost Recovery	465	100.0%	0.0%	0.0%	465	0	0
2002	592	Start-Up Cost Recovery	462	100.0%	0.0%	0.0%	462	0	0
2002	593	Emissions Cost Due Trustee	21	100.0%	0.0%	0.0%	21	0	0
2002	594	Start-Up Cost Due Trustee	43	100.0%	0.0%	0.0%	43	0	0
2002	595	Minimum Load Cost Allocation Due ISO	683	100.0%	0.0%	0.0%	683	0	0
2002	691	Emissions Cost Payment	8	100.0%	0.0%	0.0%	8	0	0

Year	Charge Type	Charge Description	No of Transactions	CAS Share	CONG Share	MS Share	CAS Amount	CONG Amount	MS Amount
2002	692	Start-Up Cost Payment	30	100.0%	0.0%	0.0%	30	0	0
2002	695	Minimum Load Cost Compensation Due SC	97	100.0%	0.0%	0.0%	97	0	0
2002	1010	Neutrality Adjustments	20715	75.0%	0.0%	25.0%	15,536	0	5,179
2002	1011	Ancillary Service Rational Buyer Adjustment	14107	75.0%	0.0%	25.0%	10,580	0	3,527
2002	1030	No Pay Provision Market Refund	14768	75.0%	0.0%	25.0%	11,076	0	3,692
2002	1061	Distribution of Preempted Spinning Reserve	2169	100.0%	0.0%	0.0%	2,169	0	0
2002	1062	Distribution of Preempted Non-Spinning Reserve	5439	100.0%	0.0%	0.0%	5,439	0	0
2002	1064	Distribution of Preempted Replacement Reserve	96	100.0%	0.0%	0.0%	96	0	0
2002	1065	Distribution of Preempted Regulation Up	35	100.0%	0.0%	0.0%	35	0	0
2002	1066	Distribution of Preempted Regulation Down	35	100.0%	0.0%	0.0%	35	0	0
2002	1120	Est. Summer Reliab. Contract Capacity Pymt/Charge	592	100.0%	0.0%	0.0%	592	0	0
2002	1121	Adj. Summer Reliab. Contract Capacity Pymt/Charge	656	100.0%	0.0%	0.0%	656	0	0
2002	1210	Existing Contracts Cash Neutrality Charge/Refund	20458	75.0%	0.0%	25.0%	15,344	0	5,115
2002	1302	due ISO	361	100.0%	0.0%	0.0%	361	0	0
2002	1481	Excess Cost Neutrality Allocation	4256	75.0%	0.0%	25.0%	3,192	0	1,064
2002	1487	Energy Exchange Program Neutrality Adjustment	7	75.0%	0.0%	25.0%	5	0	2
2002	1999	Rounding Adjustment	569	69.2%	9.3%	21.4%	394	53	122
2002	2999	Interest - Due SC	527	69.2%	9.3%	21.4%	365	49	113
2002	3999	Interest and Penalty Charge - Due ISO	214	69.2%	9.3%	21.4%	148	20	46
2003	1	Day Ahead Spinning Reservedue SC	1041	75.0%	0.0%	25.0%	781	0	260
2003	2	Day Ahead Non-Spinning Reservedue SC	841	75.0%	0.0%	25.0%	631	0	210
2003	5	Day Ahead Regulation Up due SC	1030	75.0%	0.0%	25.0%	773	0	258
2003	6	Day Ahead Regulation Down due SC	1015	75.0%	0.0%	25.0%	761	0	254
2003	51	Hour Ahead Spinning Reservedue SC	1343	75.0%	0.0%	25.0%	1,007	0	336
2003	52	Hour Ahead Non-Spinning Reserve due SC	1147	75.0%	0.0%	25.0%	860	0	287
2003	54	Hour Ahead Replacement Reservedue SC	81	75.0%	0.0%	25.0%	61	0	20
2003	55	Hour Ahead Regulation Up due SC	964	75.0%	0.0%	25.0%	723	0	241
2003	56	Hour Ahead Regulation Down due SC	916	75.0%	0.0%	25.0%	687	0	229
2003	61	Hour Ahead RMR Preemption of Spinning Reserve (HA Price)	5	100.0%	0.0%	0.0%	5	0	0
2003	65	Hour Ahead RMR Preemption of Regulation Up (HA Price)	2	100.0%	0.0%	0.0%	2	0	0
2003	66	Hour Ahead RMR Preemption of Regulation Down (HA Price)	2	100.0%	0.0%	0.0%	2	0	0
2003	71	Real Time RMR Preemption of Spinning Reserve (DA Price)	140	100.0%	0.0%	0.0%	140	0	0
2003	72	Real Time RMR Preemption of Non-Spinning Reserve (DA Price)	171	100.0%	0.0%	0.0%	171	0	0

Year	Charge Type	Charge Description	No of Transactions	CAS Share	CONG Share	MS Share	CAS Amount	CONG Amount	MS Amount
2003	81	Real Time RMR Preemption of Spinning Reserve (HA Price)	25	100.0%	0.0%	0.0%	25	0	0
2003	82	Real Time RMR Preemption of Non-Spinning Reserve (HA Price)	16	100.0%	0.0%	0.0%	16	0	0
2003	111	Spinning Reserve due ISO	5866	75.0%	0.0%	25.0%	4,400	0	1,467
2003	112	Non-Spinning Reserve due ISO	5702	75.0%	0.0%	25.0%	4,277	0	1,426
2003	114	Replacement Reserve due ISO	5751	75.0%	0.0%	25.0%	4,313	0	1,438
2003	115	Regulation Up Due ISO	5973	75.0%	0.0%	25.0%	4,480	0	1,493
2003	116	Regulation Down Due ISO	6075	75.0%	0.0%	25.0%	4,556	0	1,519
2003	124	Dispatched Replacement Reserve (Self-Provided) Capacity Withhold	2	100.0%	0.0%	0.0%	2	0	0
2003	141	No Pay Charge - Spinning Reserve	798	100.0%	0.0%	0.0%	798	0	0
2003	142	No Pay Charge - Non Spinning Reserve	313	100.0%	0.0%	0.0%	313	0	0
2003	144	No Pay Charge - Replacement Reserve	3	100.0%	0.0%	0.0%	3	0	0
2003	145	Non Compliance Charge for Regulation Up	638	100.0%	0.0%	0.0%	638	0	0
2003	146	Non Compliance Charge for Regulation Down	557	100.0%	0.0%	0.0%	557	0	0
2003	203	Day-Ahead Inter-Zonal Congestion Settlement	4291	0.0%	100.0%	0.0%	0	4,291	0
2003	204	due TO	1205	0.0%	100.0%	0.0%	0	1,205	0
2003	253	Hour-Ahead Inter-Zonal Congestion	2492	0.0%	100.0%	0.0%	0	2,492	0
2003	254	due TO	971	0.0%	100.0%	0.0%	0	971	0
2003	255	Hour-Ahead Inter-Zonal Congestion Debit to TOs	205	0.0%	100.0%	0.0%	0	205	0
2003	256	Hour-Ahead Inter-Zonal Congestion Debit to SCs	450	0.0%	100.0%	0.0%	0	450	0
2003	302	Supplemental Reactive Power Due SC	6	100.0%	0.0%	0.0%	6	0	0
2003	372	High Voltage Access Charge due ISO	63	100.0%	0.0%	0.0%	63	0	0
2003	374	High Voltage Access Revenue due PTO	68	100.0%	0.0%	0.0%	68	0	0
2003	382	High Voltage Wheeling Charge due ISO	186	100.0%	0.0%	0.0%	186	0	0
2003	383	Low Voltage Wheeling Charge due ISO	43	100.0%	0.0%	0.0%	43	0	0
2003	384	High Voltage Wheeling Revenue due TO	52	100.0%	0.0%	0.0%	52	0	0
2003	385	Low Voltage Wheeling Revenue due TO	22	100.0%	0.0%	0.0%	22	0	0
2003	401	Instructed Energy	2658	75.0%	0.0%	25.0%	1,994	0	665
2003	406	SC Unaccounted for Energy (UFElogical)	8068	75.0%	0.0%	25.0%	6,051	0	2,017
2003	407	Uninstructed Energy	10048	75.0%	0.0%	25.0%	7,536	0	2,512
2003	410	Unscheduled RMR Energy	105	75.0%	0.0%	25.0%	79	0	26
2003	481	Excess Cost for Instructed Energy	431	75.0%	0.0%	25.0%	323	0	108
2003	487	Allocation of Excess Cost for Instructed Energy	4727	75.0%	0.0%	25.0%	3,545	0	1,182
2003	521	GMC-Control Area Services	291	100.0%	0.0%	0.0%	291	0	0

Year	Charge Type	Charge Description	No of Transactions	CAS Share	CONG Share	MS Share	CAS Amount	CONG Amount	MS Amount
2003	522	GMC-Congestion Management	319	0.0%	100.0%	0.0%	0	319	0
2003	524	GMC-A/S and RT Energy Operations	396	0.0%	0.0%	100.0%	0	0	396
2003	550	FERC Fee	280	100.0%	0.0%	0.0%	280	0	0
2003	591	Emissions Cost Recovery	231	100.0%	0.0%	0.0%	231	0	0
2003	592	Start-Up Cost Recovery	231	100.0%	0.0%	0.0%	231	0	0
2003	593	Emissions Cost Due Trustee	8	100.0%	0.0%	0.0%	8	0	0
2003	594	Start-Up Cost Due Trustee	11	100.0%	0.0%	0.0%	11	0	0
2003	595	Minimum Load Cost Allocation Due ISO	296	100.0%	0.0%	0.0%	296	0	0
2003	691	Emissions Cost Payment	1	100.0%	0.0%	0.0%	1	0	0
2003	692	Start-Up Cost Payment	10	100.0%	0.0%	0.0%	10	0	0
2003	695	Minimum Load Cost Compensation Due SC	40	100.0%	0.0%	0.0%	40	0	0
2003	1010	Neutrality Adjustments	10929	75.0%	0.0%	25.0%	8,197	0	2,732
2003	1011	Ancillary Service Rational Buyer Adjustment	6649	75.0%	0.0%	25.0%	4,987	0	1,662
2003	1030	No Pay Provision Market Refund	6905	75.0%	0.0%	25.0%	5,179	0	1,726
2003	1061	Distribution of Preempted Spinning Reserve	4103	100.0%	0.0%	0.0%	4,103	0	0
2003	1062	Distribution of Preempted Non-Spinning Reserve	5478	100.0%	0.0%	0.0%	5,478	0	0
2003	1065	Distribution of Preempted Regulation Up	69	100.0%	0.0%	0.0%	69	0	0
2003	1066	Distribution of Preempted Regulation Down	70	100.0%	0.0%	0.0%	70	0	0
2003	1120	Est. Summer Reliab. Contract Capacity Pymt/Charge	194	100.0%	0.0%	0.0%	194	0	0
2003	1121	Adj. Summer Reliab. Contract Capacity Pymt/Charge	128	100.0%	0.0%	0.0%	128	0	0
2003	1210	Existing Contracts Cash Neutrality Charge/Refund	10384	75.0%	0.0%	25.0%	7,788	0	2,596
2003	1302	due ISO	173	100.0%	0.0%	0.0%	173	0	0
2003	1481	Excess Cost Neutrality Allocation	142	75.0%	0.0%	25.0%	107	0	36
2003	1999	Rounding Adjustment	21	69.2%	9.3%	21.4%	15	2	4
2003	3999	Interest and Penalty Charge - Due ISO	64	69.2%	9.3%	21.4%	44	6	14
		2001 wgt share	265,192	70.1%	7.5%	22.4%	185,935	19,782	59,475
		2002 wgt share	235,437	69.9%	9.2%	20.9%	164,508	21,663	49,266
		2003 wgt share	123,931	71.7%	8.0%	20.3%	88,878	9,941	25,112
		all years wgt share	**624,560**	**70.3%**	**8.2%**	**21.4%**	**439,321**	**51,387**	**133,852**

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3	**California ISO**
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6	**Designated Recipient:**
7	**Nature of Data:Bill impact analysis using 2004 Revenue Requirement and billing determinants July 2002 - June 2003**
8	**Dated: October 24, 2003**
9	**Date of Release:**

	A	B	C	D	E	F	G
1	**California ISO Confidential**						
2	**Hypothetical Bills Using 2004 Revenue Requirement and Current GMC Rate Design**						
3							
4			Masked ID	Control Area Services	Congestion Management	Ancillary Services/Real Time Energy Operations	Total Cost under Current Rate Structure
5							
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	A	B	C	D	E	F	G
1	**California ISO Confidential**						
2	**Hypothetical Bills Using 2004 Revenue Requirement and Current GMC Rate Design**						
3							
4			Masked ID	Control Area Services	Congestion Management	Ancillary Services/Real Time Energy Operations	Total Cost under Current Rate Structure
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	A	B	C	D	E	F	G
1	**California ISO Confidential**						
2	**Hypothetical Bills Using 2004 Revenue Requirement and Current GMC Rate Design**						
3							
4			Masked ID	Control Area Services	Congestion Management	Ancillary Services/Real Time Energy Operations	Total Cost under Current Rate Structure
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	A	B	C	D	E	F	G
1	**California ISO Confidential**						
2	**Hypothetical Bills Using 2004 Revenue Requirement and Current GMC Rate Design**						
3							
4			Masked ID	Control Area Services	Congestion Management	Ancillary Services/Real Time Energy Operations	Total Cost under Current Rate Structure
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	A	B	C	D	E	F	G
1	**California ISO Confidential**						
2	**Hypothetical Bills Using 2004 Revenue Requirement and Current GMC Rate Design**						
3							
4			Masked ID	Control Area Services	Congestion Management	Ancillary Services/Real Time Energy Operations	Total Cost under Current Rate Structure
5							
138							
139							
140							
141							
142							
143				$ -	$ -	$ -	$ -

California ISO
Confidential
Hypothetical Bills using 2004 Revenue Requirement and 2004 Rate Design

Code	Core Reliability Services	Energy & Transmission Services: A	Energy & Transmission Services: B	Forward Scheduling	Congestion Management	Market Services	Settlements, Metering and Client Relations	Total	Diff from Current GMC Structure
2									$ 41,853
3									$ 46,513
4									$ 332,663
5									$ 394,234
6									$ 147,229
7									$ 185,519
8									$ (804,671)
9									$ 151,593
10									$ 3,000
11									$ -
12									$ 160,322
13									$ 419,778
14									$ 452,965
15									$ 61,113
16									$ 407,160
17									$ 3,500
18									$ -
19									$ 100,322
20									$ 500
21									$ 6,000
22									$ -
23									$ 145,280
24									$ 573,658
25									$ -
26									$ 1,000
27									$ 510,394
28									$ 1,500
29									$ 1,000
30									$ 114,099
31									$ 3,000
32									$ 500
33									$ (1,101,067)

California ISO
Confidential
Hypothetical Bills using 2004 Revenue Requirement and 2004 Rate Design

	Code	Core Reliability Services	Energy & Transmission Services: A	Energy & Transmission Services: B	Forward Scheduling	Congestion Management	Market Services	Settlements, Metering and Client Relations	Total	Diff from Current GMC Structure
38	34									$ 789
39	35									$ (26,850)
40	36									$ 372,835
41	37									$ -
42	38									$ 11,014
43	39									$ (23,474)
44	40									$ 63,039
45	41									$ 6,000
46	42									$ 477,726
47	43									$ (46,804)
48	44									$ 149,486
49	45									$ 2,000
50	46									$ 500
51	47									$ 22,209
52	48									$ 26,461
53	49									$ 542,705
54	50									$ 605,521
55	51									$ -
56	52									$ 58,126
57	53									$ 825,645
58	54									$ (242,736)
59	55									$ 500
60	56									$ 6,000
61	57									$ 159,900
62	58									$ 78,236
63	59									$ 39,411
64	60									$ 500
65	61									$ 198,487
66	62									$ 59,252
67	63									$ 22,237
68	64									$ 16,203
69	65									$ -

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California ISO
Confidential

Hypothetical Bills using 2004 Revenue Requirement and 2004 Rate Design

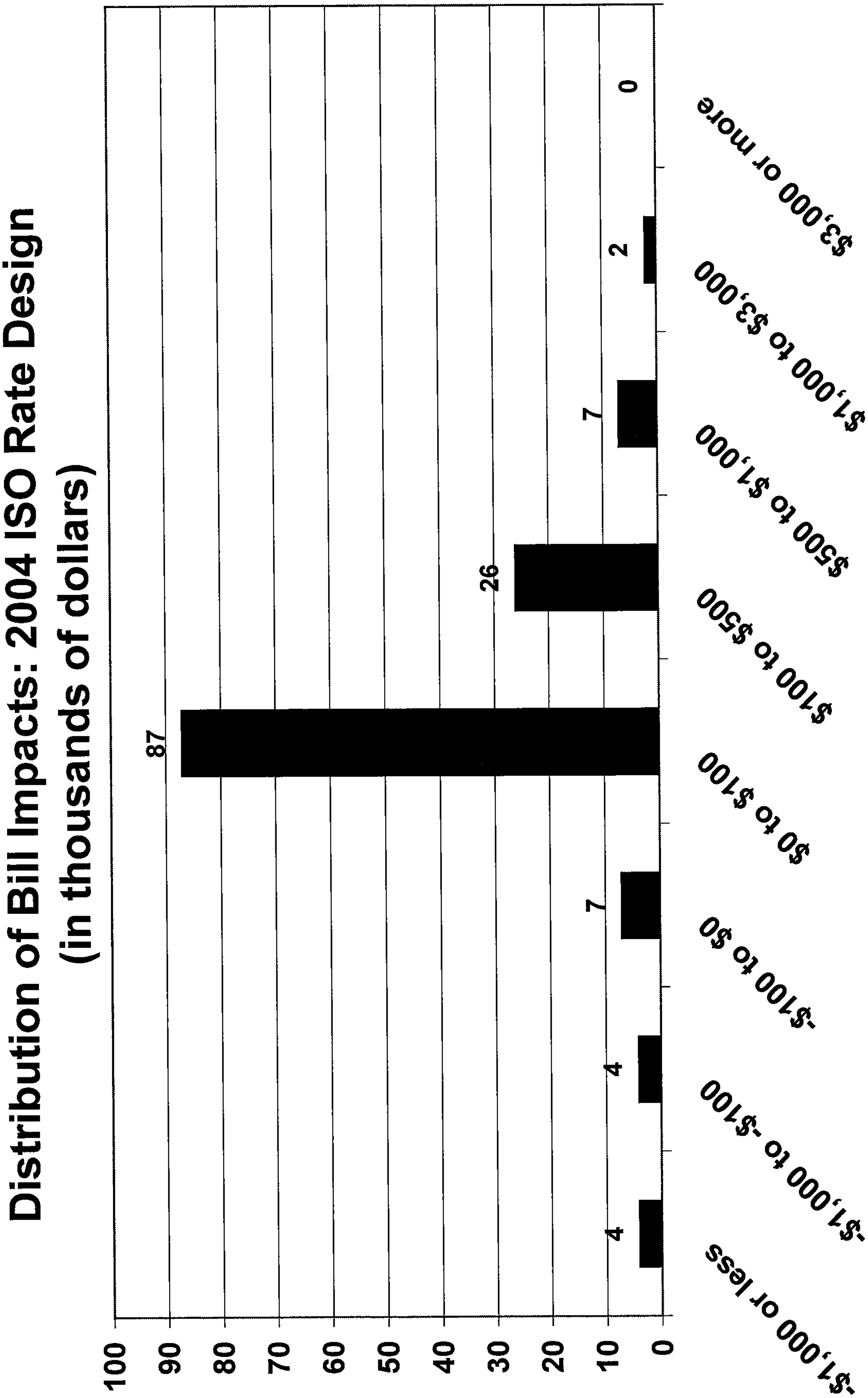
	Code	Core Reliability Services	Energy & Transmission Services: A	Energy & Transmission Services: B	Forward Scheduling	Congestion Management	Market Services	Settlements, Metering and Client Relations	Total	Diff from Current GMC Structure
5										
70	66									$ 24,993
71	67									$ 49,145
72	68									$ (579,440)
73	69									$ 11,223
74	70									$ 45,337
75	71									$ 3,000
76	72									$ 1,501
77	73									$ 885,924
78	74									$ 339,380
79	75									$ 500
80	76									$ (10,618,496)
81	77									$ -
82	78									$ -
83	79									$ 113,673
84	80									$ 500
85	81									$ 82,844
86	82									$ 40,470
87	83									$ 1,352
88	84									$ -
89	85									$ 1,381
90	86									$ -
91	87									$ -
92	88									$ 11,674
93	89									$ 80,003
94	90									$ 317,239
95	91									$ 6,000
96	92									$ 2,500
97	93									$ 153,584
98	94									$ (37,383)
99	95									$ (744,221)
100	96									$ 500
101	97									$ 80,808

	A	B	C	D	E	F	G	H	I	J	K	L
1								California ISO Confidential				
2								Hypothetical Bills using 2004 Revenue Requirement and 2004 Rate Design				
3												
4			Code	Core Reliability Services	Energy & Transmission Services: A	Energy & Transmission Services: B	Forward Scheduling	Congestion Management	Market Services	Settlements, Metering and Client Relations	Total	Diff from Current GMC Structure
5												
102			98									$ 28,693
103			99									$ (97,444)
104			100									$ (1,267,693)
105			101									$ 150,290
106			102									$ 80,848
107			103									$ -
108			104									$ 5,216
109			105									$ 3,500
110			106									$ 6,000
111			107									$ 3,904
112			108									$ 3,000
113			109									$ 3,000
114			110									$ 5,000
115			111									$ 772,510
116			112									$ 1,125,271
117			113									$ -
118			114									$ (10,922)
119			115									$ 3,000
120			116									$ 1,000
121			117									$ 40,226
122			118									$ 27,444
123			119									$ 88,012
124			120									$ 6,000
125			121									$ (2,094,254)
126			122									$ 115,534
127			123									$ 80,357
128			124									$ 440,816
129			125									$ -
130			126									$ 3,095
131			127									$ -
132			128									$ 478,766
133			129									$ 78,218

	A	B	C	D	E	F	G	H	I	J	K	L
1							California ISO Confidential					
2							Hypothetical Bills using 2004 Revenue Requirement and 2004 Rate Design					
3												
4			Code	Core Reliability Services	Energy & Transmission Services: A	Energy & Transmission Services: B	Forward Scheduling	Congestion Management	Market Services	Settlements, Metering and Client Relations	Total	Diff from Current GMC Structure
5												
134			130									$ 6,000
135			131									$ 68,600
136			132									$ 114,891
137			133									$ 21,380
138			134									$ 1,099,387
139			135									$ 500
140			136									$ 7,527
141			137									$ 500
142			138									$ (8,599)
143				$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	

	A	B	C	D	E	F	G	H	I
1	California ISO								
2	Hypothetical Rate Comparison 2003 Rate Design and 2004 Rate Design								
3	Non-Confidential								
4									
5									
6	2003 Rate Design with 2004 Revenue Requirement	Control Area Services	Congestion Management	Ancillary Services and Real Time	Total				
7									
8	% of Total	63%	13%	25%	100%				
9	Revenue Requirement	$ 136,443,905	$ 27,453,237	$ 54,345,707	**$ 218,242,849**				
10	7/2002-6/2003 Volume	247,920,322	91,556,671	66,602,775					
11	Rate / MWh	$ 0.550	$ 0.300	$ 0.816					
12	Description	Gross Control Area Load & Exports	Net HA Scheduled interzonal flows	Purchases & sales of A/S , instructed energy and the absolute value of					
13									
14									
15									
16	2004 Rate Design with 2004 Revenue Requirement	Core Reliability Services	Energy & Transmission Services Load	Energy & Transmission Services Deviation	Forward Scheduling	Congestion Management	Market Usage	Settlements, Metering and Client Relations	Total
17									
18	% of Total	39%	23%	6%	9%	7%	16%	0%	100%
19	Revenue Requirement	$ 85,143,801	$ 51,087,845	$ 12,771,961	$ 19,747,044	$ 14,900,040	$ 34,030,944	$ 561,213	**$ 218,242,849**
20	7/2002-6/2003 Volume	518,443	241,723,194	18,339,917	13,261,692	91,556,671	42,662,669	999	
21	Forecast Escalation Quantity	12,227	2,028,040	-	-	768,154	-	123	
22	Forecast 1/2004-12/2004 Volume	530,670	243,751,234	18,339,917	13,261,692	92,324,825	42,662,669	1,122	
23	Rate / MW, MWh, Cust Mo	$ 160.446	$ 0.210	$ 0.696	$ 1.489	$ 0.161	$ 0.798	$ 500.00	
24	Description	Metered non-coincident peak demand MW	Control Area Metered Load	Absolute value of net uninstructed deviations by settlement interval in MWh	Final HA schedules submitted, no charge for changes to DA schedules	Net Scheduled Interzonal load (flows)MWh	Purchases and sales of Ancillary Services, instructed energy and absolute value of net	Number of customer months	
25									

Charts and Data are on the following worksheets


Distribution of Bill Impacts: 2004 ISO Rate Design
(in thousands of dollars)
0
10
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70
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90
100
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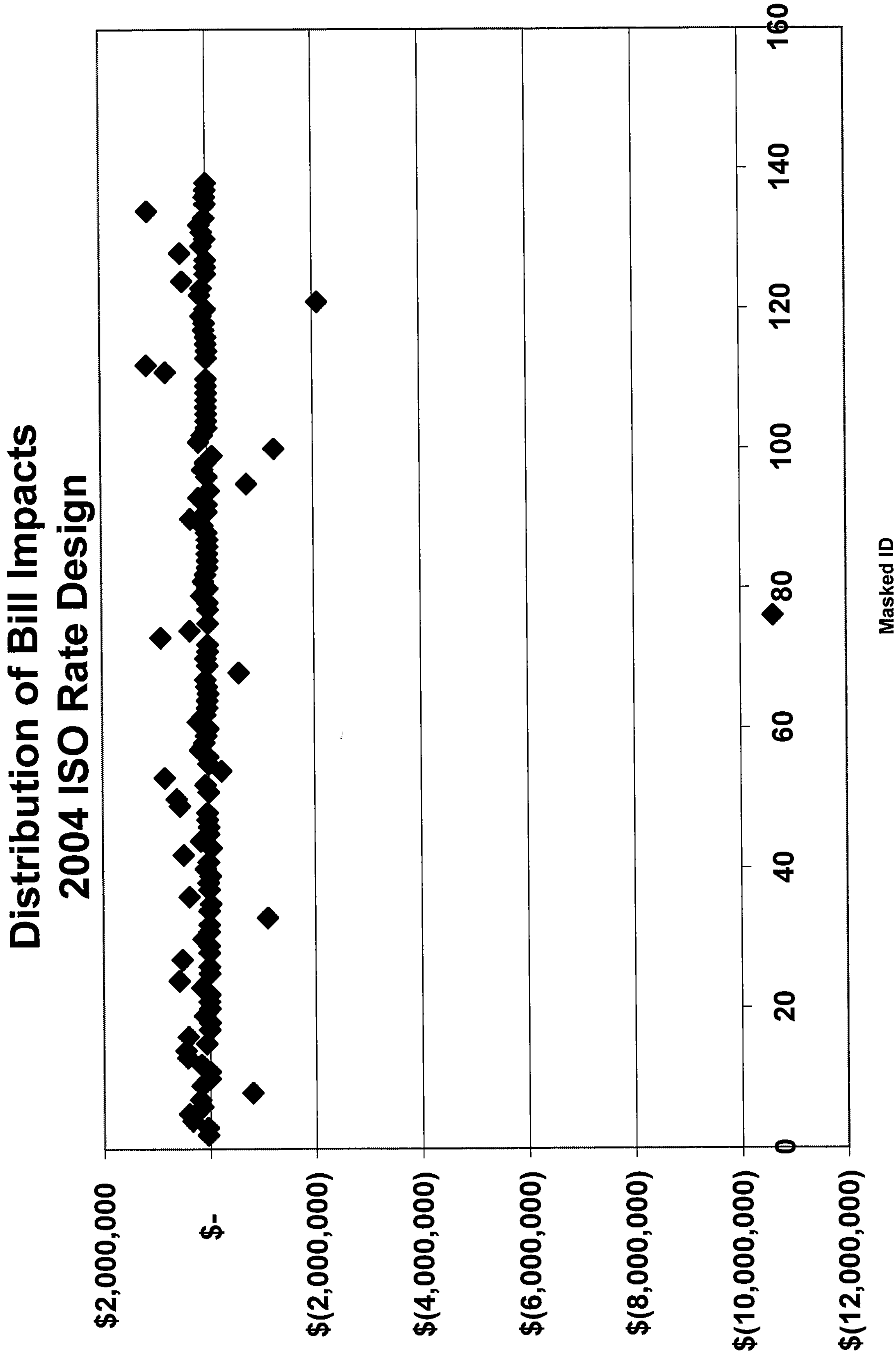
7
87
26
7
2
0
-$1,000 or less
-$1,000 to -$100
-$100 to $0
$0 to $100
$100 to $500
$500 to $1,000
$1,000 to $3,000
$3,000 or more


Distribution of Bill Impacts
2004 ISO Rate Design
$2,000,000
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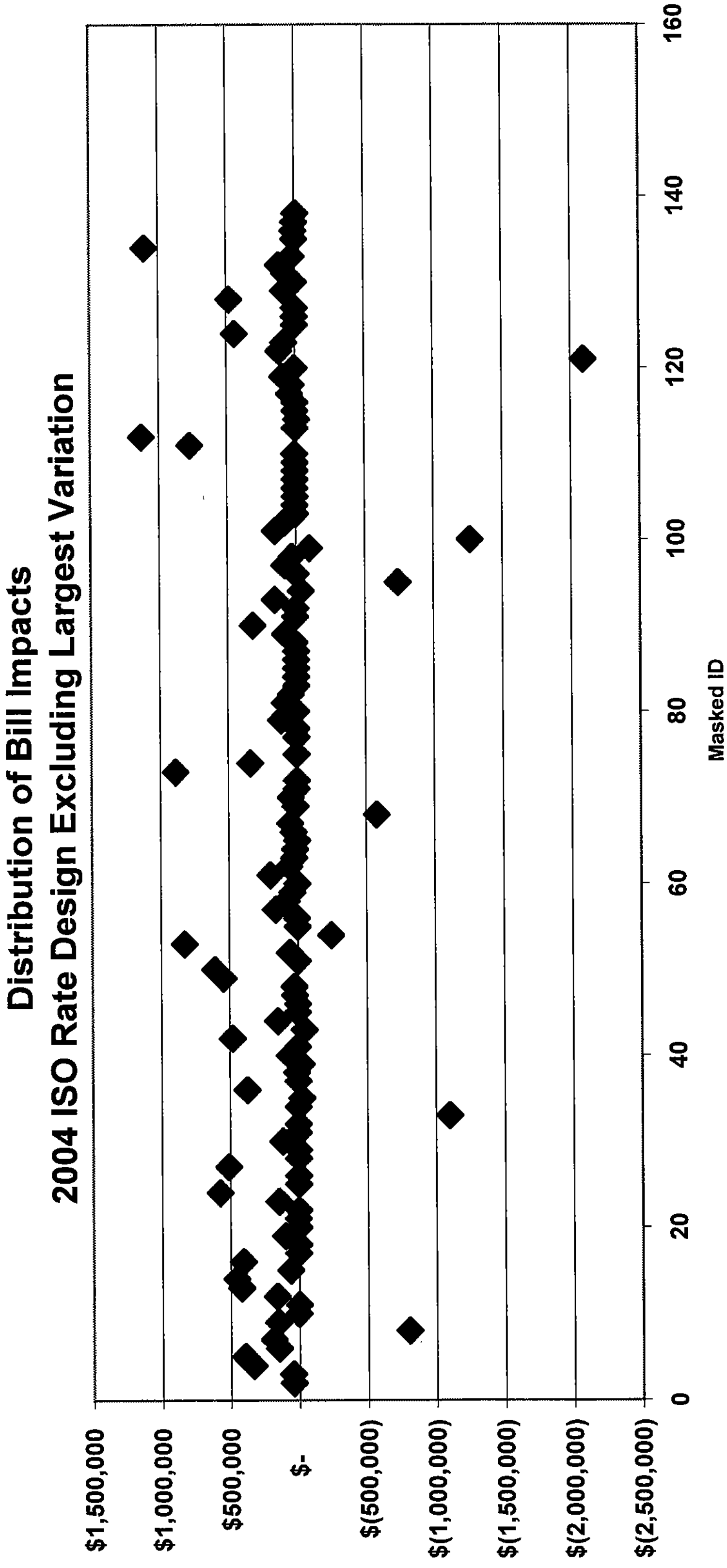
160
Masked ID


Distribution of Bill Impacts
2004 ISO Rate Design Excluding Largest Variation
$1,500,000
$1,000,000
$500,000
$-
$(500,000)
$(1,000,000)
$(1,500,000)
$(2,000,000)
$(2,500,000)
0
20
40
60
80
100
120
140
160
Masked ID

CALIFORNIA
ENERGY
COMMISSION

CALIFORNIA ENERGY DEMAND 2003-2013 FORECAST

STAFF REPORT

Prepared in Support of the Electricity and Natural Gas Report under the Integrated Energy Policy Report Proceeding (02-IEP-01)

AUGUST 2003
100-03-002

Gray Davis, *Governor*

CALIFORNIA ENERGY COMMISSION

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Integrated Energy Policy Report

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Introduction

This California Energy Commission staff report documents the electricity, peak, and natural gas demand forecasts for the State of California and for each utility planning area within the state. These forecasts were prepared in support of the ***2003 Integrated Energy Policy Report*** (IEPR). An overview of the forecast results and key assumptions is found in Chapter Two of the ***Electricity and Natural Gas Trends Report***. The purpose of this report is to document the methods, key assumptions, and results of the final demand forecasts. Detailed forecast results are found in the appendices at the end of this report. All appendices will also be available for downloading in spreadsheet format from the Energy Commission website at [http://www.energy.ca.gov/energypolicy/documents/index.html]. Further detail on model methodologies may be found in *California Energy Demand: 1995-2015, Volume II Electricity Demand Forecasting Models*, July 1995 (Publication Number 300-95-005).

The final demand forecast for the IEPR incorporates several changes as a result of comments received on the draft forecast presented at the February 25, 2003 workshop. First, staff revised the electricity rate forecasts based on comments from utilities. Staff also updated the investor-owned utilities' (IOUs) 2003 rates to reflect recent changes.

Second, demand side management (DSM) savings included in the forecast were changed to assume that the current level of funding persists through 2011, as authorized by the legislature.

Finally, staff reduced the impact of personal income in the calculation of the miscellaneous end use consumption starting in 1996 in the residential sector. This change was made to all service areas to better match historic growth in residential consumption. Previously, growth in personal income in the late 1990s produced a backcast that grew much faster than actual consumption. The use per household now grows at essentially the historic rate. Staff also updated the county-level personal income forecast. The combined effect of all changes is to reduce average annual demand growth by 0.5 percent per year over the next ten years.

Overview of Demand Forecast Methods

The Energy Commission forecasts energy demand for five major economic sectors, eight electric utility areas and four natural gas utility areas. Each model develops a forecast using a complex series of calculations that simultaneously consider economic factors, population, weather characteristics, changes in energy utilization, regulatory conditions, and recorded consumption. The models forecast electricity and natural gas use simultaneously to produce consistent total energy forecasts. End use forecasting models are used for the three largest sectors (residential, commercial and industrial). Generally, these models calculate electricity consumption as the sum of electricity requirements from all end uses. The requirements for each end use are determined as the product of the number of customers having the electricity using equipment and the annual consumption per unit. The calibrated and aggregated results of the sector forecasts serve as inputs to the hourly load forecasting model to determine system peak.

The aggregate demand for energy services increases with growth in economic activity and population and as new forms of energy service become available. The forecasts are driven by projections of sector specific economic and demographic variables that have been found to best characterize the need for energy services. County or regional forecasts are translated into utility planning or service area forecasts. The Energy Commission has developed several models that provide the economic and demographic variables used to drive the sector models. Examples are the housing model for the residential sector and floor space model for the commercial building model.

Geographic and Sectoral Data Disaggregation

Forecasts are developed and reported for eight electric service/planning areas and four natural gas distribution regions (**Table 1**). A planning area denotes a geographic region of an electric investor-owned utility which includes municipalities and irrigation districts not served directly by the larger investor-owned utility. An electric service area denotes a geographic area for which a single utility provides electric distribution services. Natural gas planning areas include municipal gas utilities.

The geographic areas and weather zones covered by these service areas are very diverse. Smaller municipal utilities and irrigation districts as well as Sacramento Municipal Utility District (SMUD) have very compact and homogeneous climates. The larger areas contain very diverse climates. Residential and commercial energy consumption patterns are influenced by weather, therefore, these two sectors are modeled by climate zone and results aggregated to the utility service/planning area. The number of climate zones in a given area depends upon the diversity of climate within the area and the availability of suitable weather stations.

The Pacific Gas and Electric (PG&E) area covers the majority of California north of Bakersfield. This includes large portions of the hot central valleys as well as the highly populated and cool coastal San Francisco bay area. For forecasting purposes PG&E is represented by five distinct weather stations (Ukiah, Sacramento, Fresno, San Jose and San Francisco).

Southern California Edison (SCE) covers the majority of the state from Bakersfield south. SCE is represented by four distinct weather stations (Fresno, Long Beach, Burbank and Riverside).

Los Angeles Department of Water and Power (LADWP) encompasses the city of Los Angeles as well as part of the Owen's Valley. This service area has both coastal and inland regions and is represented by Long Beach and Burbank as weather stations.

The San Diego Gas and Electric (SDG&E) service territory includes all of San Diego County as well as a small part of southern Orange County. Currently, SDG&E is represented by San Diego's Lindbergh Field. Staff is evaluating a combination of San Diego, Miramar and El Cajon for future forecasting purposes.

Table 1
Utilities within Forecasting Areas

Planning/Service Area	Utilities Included	
Electric Areas		
Pacific Gas and Electric (PG&E)	PG&E Alameda Biggs Calaveras Gridley Healdsburg Lassen MUD Lodi Lompoc Merced Modesto	Palo Alto Plumas - Sierra Redding Roseville San Francisco Shasta Silicon Valley Tuolumne Turlock Irrigation District Ukiah USBR-CVP
Sacramento Municipal Utility District (SMUD)	SMUD	
Southern California Edison (SCE)	Anaheim Anza Azusa Banning Colton MWD	Riverside Southern California Edison Southern California Water USBR-Parker Davis Valley Electric Vernon
Los Angeles Department of Water and Power (LADWP)	LADWP	
San Diego Gas and Electric (SDG&E)	SDG&E, Escondido	
Cities of Burbank, Glendale, and Pasadena (BGP)	Burbank Glendale Pasadena	
Other Planning Area (OTHER)	PacifiCorp Sierra Pacific Surprise Valley	Truckee-Donner PUD Imperial Irrigation District (IID)
Department of Water Resources (DWR)	DWR	
Natural Gas Distribution Areas		
PG&E	PG&E Electric Planning Area SMUD	
SDG&E	SDG&E	
Southern California Gas Company (SCG)	SCG SCE, LADWP, BGP Electric Planning Areas	
OTHER	Washington Water Southwest Gas Corporation	

SMUD has the most homogeneous weather of the major utilities. The service area encompasses Sacramento County and is represented by Sacramento Executive Airport.

The data can also be aggregated across regions consistent with congestion zones associated with the electricity transmission grid operated by the California Independent System Operator (CAISO). The CAISO service territory currently includes the majority of the state with the exception of LADWP, SMUD and few other small areas. Staff has used a combination of the above nine weather stations weighted by the representative residential air conditioning saturations to approximate the daily summer temperature facing the CAISO region. **Appendix B** and **Appendix D** include forecast tables aggregated by CAISO congestion zone.

Forecast Data Sources and Assumptions

Disaggregate end use models require extensive data. Four classes of data are required to establish useful disaggregate forecasting models. First, consumer characteristics data such as end use appliance saturations, dwelling size and age, occupants' income and demographic makeup, and utility bills are important. Second, aggregate consumption data for the nonresidential sectors classified by the Standard Industrial Classification (SIC) code devised by the federal government. Third, disaggregate economic and demographic projections at a level of detail matching the customer sectors of the energy forecasting models. Each of these will be discussed separately. Finally, data or estimates of energy impacts from building and appliances standards or efficiency programs are needed to account for conservation effects on demand.

Consumer Characteristics

Consumer characteristics data include information on consumers' appliance and equipment holdings, building characteristics, conservation measures and behavior, demographic and operation characteristics of firms, and load shifting opportunities and behavior. This information helps explain evolving energy use patterns by identifying factors that influence customers' choices of how much energy to consume as well as what options were available when they made their choices.

A wealth of data exist describing consumers but only utilities have the ability to link together customer characteristics with utility bills. Thus, the principal focus of activity regarding consumer characteristics is to obtain customer survey data from utilities in a usable, timely manner. In the past, Energy Commission staff assisted the utilities in designing customer surveys and post-collection data editing. Estimates of appliance and equipment saturations and end use intensities from these surveys are incorporated in the residential and commercial models. Currently, the Energy Commission is managing customer surveys for the residential and commercial sectors that will allow updating of customer characteristics for the next IEPR forecast.

Energy Consumption Data

Electricity and natural gas consumption data by SIC code has proved to be an invaluable source of basic energy usage for the nonresidential sector. Supplied on a quarterly basis for individual months by every utility in the state, this data allows use of planning area customer sector models where no matches in rate classification by all affected utilities would be possible. Quarterly Fuel and Energy Report (QFER) data supplied by utilities by 3- or 4-digit SIC code is processed by

Energy Commission staff into various customer groupings. This now includes improved reporting of self generation by utilities.

Economic/Demographic and Fuel Price Projections

An essential input into the staff forecasting models are appropriate economic, demographic, and fuel price projections for each planning area. Several translation models convert usual economic and demographic data into the actual "energy driver variables" which are used in the model to forecast energy usage. For example, in the commercial building sector, the key energy driver is floor space by building type, while the economic and demographic variables are employment of various types, taxable sales, and various groupings of population. A different mix of each of these "econ/demo" variables has been found useful in projecting each building type's floor space additions through historic analysis of additions and econ/demo variables. **Table 2** lists these drivers by sector and the variables from which they are developed for each sector.

Table 2
Translation of Economic and Demographic Variables

Sector	Energy Driver	Econ/Demo
Residential	a. Households, by type b. Income per capita c. Persons per household, by type d. Fuel prices	a. Population, by residential and group quarters b. Income per capita c. Persons by household
Commercial	a. Floor space, by building type b. Fuel prices	a. (1) Employment, by type (2) Taxable sales (3) Population, by age grouping
Industrial	a. Value of shipments, by industry c. Fuel prices	a. Value of shipments, by industry
Agriculture	a. Total agricultural production b. Surface/ground water split c. Dairy and livestock production d. Electricity and diesel price e. Rainfall and weather data	a. Total number of homes b. Per capita income

For the 2003-2013 forecasts, the Energy Commission used the September 2002 University of California, Los Angeles (UCLA) Anderson Forecast in combination with the 2002 Global Insight forecast. UCLA forecasts economic conditions for the state as a whole, including forecasts of personal income, and employment for detailed commercial and industrial sectors. To develop economic forecasts for the Energy Commission's utility areas, county-level income and industrial production projections from Global Insight are used in combination with the UCLA statewide forecast.

The California Department of Finance (DOF) June 2001 *Interim County Population Projections* were used to develop projections of household population and persons per household, along with DOF's E-5 County/State Population and Housing Estimates.

The base case forecast assumes that stronger economic growth will resume in late 2003, followed by steady growth, but at a lower rate than previous recoveries. To quantify the potential impact on demand of unanticipated economic trends, the Energy Commission developed several scenarios to support evaluation of risks to infrastructure and supply adequacy.

The high economic growth scenario models the effects of a more robust economy on energy demand. Over the last twenty years, the average annual post-recession employment growth rate has averaged about 1percent higher than the growth rate assumed in the baseline employment forecast. To model the effects of a stronger recovery on energy demand, the employment forecast was accelerated to achieve a new forecast with an annual growth of slightly more than 1 percent higher for the years 2004-2007. Other economic drivers for the sector forecasts were also accelerated by one or two years for similar results. After 2007, the baseline forecast trend resumes. Conversely, to develop a low economic growth scenario, the forecasted growth beginning in 2004 is delayed by one to two years so that growth on average is slightly more than 1 percent lower than the baseline economic forecast. **Appendix G, Table G-2** documents the major economic drivers for the scenarios at statewide level. Electricity demand scenario forecast results are presented at the end of **Appendix B** and **Appendix D,** and natural gas results in **Appendix E**

Energy price projections are an important input into any energy demand forecast. The prices used for this forecast are in **Appendix G**. This forecast used the February draft end user natural gas price projections prepared by the Fuels Resources Office. The final natural gas price forecast is documented in ***Natural Gas Market Assessment*** (Publication number 100-03-006). Electricity retail rate projections are prepared for use by demand forecasting staff by the Electricity Analysis Office. More detail on the final rate forecast is published in ***California IOU Retail Electricity Price Outlook 2003-2013*** (Publication number 100-03-003).

DSM Quantification

A major effort of Energy Commission forecasting has been to account for the influence of conservation and energy efficiency that is "reasonably expected to occur" (RETO) in an internally consistent manner. Since 1985 the Energy Commission has distinguished between savings impacts that are reasonably expected to occur (committed RETO) and savings that are likely to occur (uncommitted RETO) if current trends in funding and policy continue to contribute additional savings from future year programs. The uncommitted DSM forecast of load impacts from programs or other actions was then included on the resource side, to allow comparison of DSM to other resource options.

While program proposals and budgets still require annual approval by the California Public Utilities Commission (CPUC), the IOU Public Goods Charge programs have been authorized by the legislature through 2011, and because this spending is required by statute and CPUC policy, they are included in the baseline forecast. Staff has not included 2005 building standards in the forecast because they still require adoption.

The methodology to project savings from conservation and load management programs has required extensive effort over numerous forecast cycles. Effort has been devoted to developing forecasting models capable of endogenously quantifying the savings of major individual programs and savings due to market forces.

Attribution of Savings

Most building and appliance standards are modeled within the sector forecast models. The models account for building decay, equipment replacement and estimates of market-induced impacts. The large number of current and prospective conservation and efficiency programs modeled requires substantial effort to quantify individually, and these conservation quantification runs were not done as part of the 2003 IERP. A major focus in preparation for the next IERP will be review and updating of standards modeling and conducting an updated conservation quantification analysis.

Attribution of savings from standards is guided by the principle that program savings are determined in the reverse order of introduction. This chronological sequencing approach requires that a series of model runs be made. As an example, let A, B, and C denote three runs of a sector model characterizing the combined influence of two programs, a single program introduced first, and no programs, respectively. The difference between runs A and B quantifies the savings from the last program introduced. This convention makes the estimate for the second program conditional upon the first. The difference between runs B and C quantifies the savings from the first program introduced. This example is complicated several fold in actual practice due to the large number of programs.

A significant complication of implementing this convention is the attribution of savings to market forces, including direct consumer price response. Extending the previous example further, let run D denote a case with fuel prices constant at the level of some reference year. Runs A, B and C used fuel price assumptions from the baseline forecast. Market savings are quantified as the difference between runs C and D. This is a straightforward extension of the previous example. Unfortunately, savings quantified using runs A, B, and C are conditional upon the market savings, which depend upon the fuel price assumptions of the baseline forecast. Changes in such fuel price assumptions, all other effects held constant, change the savings quantified for each program. High fuel prices lead to lower program savings and lower fuel prices lead to higher program savings.

The impacts from many DSM programs sponsored by utilities, state government, local government and other organizations are also estimated directly within the end use models. However, because of the large number of programs and the extreme difficulty in attributing impacts to particular programs, no attempt is made to attribute impacts through an iterative process. Estimated savings by program are obtained directly from utilities and public agencies. At the aggregate, the utility and program estimates are used to gauge the impacts included within the end use models.

Estimates of impacts calculated outside the sector models are the product of a four step process. First, first year impacts are assigned a useful measure life. Second, a degradation factor is applied to each year of the useful life to account for poor maintenance or equipment failure. Third, adjustments are made to distinguish between program-induced and market effects. The final results are aggregated and provided to the summary model where they are used to evaluate the sector forecasts. **Appendix K** contains the cumulative utility program savings forecast based on reported annual savings through 2001. Complete data were not yet available for 2002; staff estimated incremental savings based on utility energy efficiency program plans, and extended this annual impact through 2011.

Sector Energy Forecasts

The aggregate demand for energy services increases with growth in economic activity and population, and as new forms of energy service become available. The Energy Commission energy demand forecasts are driven by projections of sector specific economic and demographic variables. **Table 3** shows the coverage and end use detail of each sector model.

Table 3
End Use Characteristics of Sectoral Models

Sector	Customers Groups Included	End Uses Covered
Residential	All residential electricity and natural gas, by 3 housing types	21 major appliance and space conditioning categories
Commercial Building	All building related electricity and natural gas use in SIC codes 50-96 by 11 building types	10 equipment and space conditioning categories
Other commercial (TCU)	All electricity and natural gas used by 14 industries in SIC codes 40-49, (ex. 422, 494, 497), 752, and 97	none
Street Lighting	street lighting electricity	street lights
Manufacturing and Mining Industries	All electricity and natural gas used by 33 2-digit and 3-digit manufacturing SIC codes. 7 extraction and construction industries in SIC codes 10-17	none
Agriculture	All electricity and natural gas used by SIC codes 01,02, 08,and 09, covering crops, livestock, forestry, hunting and commodities	irrigation pumping building heating crop drying
Water Supply	All electricity used by the water supply industry of SIC codes 494 and 497	water supply pumping

Residential Consumption Forecast

Energy forecasts for the residential sector are made with a detailed end use model. The three primary components of the model are households, appliance saturations, and average annual energy use per appliance by vintage. Energy use for an end use category is determined by the product of total households, appliance saturation and energy use per appliance.

Residences are grouped into three different housing types—single family, multi-family and mobile homes. Residences are further classified by vintage. Vintage is determined by the California building standard in effect when the residence was built. For each housing type, some combination of electricity and/or natural gas consumption occurs in 24 individual end uses (**Table 4**). In most cases, the end uses do not necessarily represent distinct appliance types. Electric space heating, for example, is one end use category, but includes three types of heating appliances—baseboard heaters, central heating systems, and heat pumps. Other end uses, such as refrigerators and freezers, do characterize individual appliance end uses.

Table 4
Residential End Use and Fuel Type Classifications

End-Use	Description	Electric	Gas
Central A/C	Whole house air conditioning systems	X	X
Room A/C	Window air conditioners	X	
Evap. A/C	Evaporative coolers	X	
Space Heat	Heat pumps, baseboard heaters and central heating systems	X	X
Furnace Fan	Central heating and cooling furnace fans	X	
Hot Water – DW	Water heating for dishwashers	X	X
Hot Water - CW	Water heating for clothes washer	X	X
Water Heater	Basic water heating for all other uses	X	X
Refrigeration	Refrigerators	X	
Freezer	Stand alone freezers	X	
Color Television	Major household appliance	X	
Cooking	Stove tops and ovens—excludes microwaves	X	X
Dishwasher	Dishwasher motor only	X	
Clothes Dryer	Clothes dryer	X	X
Clothes Washer	Washing machine motor	X	
Solar Backup	Backup for solar water heating systems	X	X
Solar Pumps	Pumps on solar water heating systems	X	
Water Bed	Heating element for water beds	X	
Miscellaneous	Miscellaneous uses including lighting, small appliances and electronics	X	X
Pool Pump	Swimming pool water pump	X	
Pool Heater	Water heating for swimming pools	X	X
Pool Backup	Backup for pool's solar water heating system, including pump	X	X
Tub Pump	Hot tub water pump	X	
Tub Water Heat	Water heating for hot tubs	X	X

End use consumption is estimated for each combination of housing type, fuel type, and climate zone. The three main components of the residential model are households, appliance stock, and unit energy consumption (UEC).

The household component provides projections of person per household (PPHH), per capita income (PCI) by climate zone, and housing stock by climate zone and housing type. Housing stock projections are used to calculate appliance stocks. Historical stock calculations are based on census data and utility appliance saturation surveys. Projected stocks are based on computed retention factors, saturations in new homes and free market marginal saturations (the appliance saturation in new homes). Person per household and per capita income are used to calculate unit energy consumption for some appliances.

The UEC component estimates average UECs for the purchase year. These UECs are based upon average consumption in the base year, new equipment efficiencies, persons per household, and energy efficiency retrofit programs. For space conditioning end uses, the thermal integrity of dwellings is also taken into account.

Commercial Sector Forecast

The commercial end use forecasting model models total energy consumption by commercial buildings as the sum of energy consumption of individual end uses for twelve building types. End use energy consumption is determined by the amount of floor space, the proportion of floor space receiving an end use energy service, and the type, efficiency and use of energy using equipment.

Each building type aggregates energy consumption resulting from economic activity surrounding the selling and distribution of final goods and services. **Table 5** displays a breakdown of the twelve building types by SIC code. A forecast of floor space is developed for each building type within each planning area. The floor space is forecast econometrically using F.W. Dodge construction data on building additions, floor space saturations from survey data, and the economic driver found to best predict economic trends for that building type. For example, school age population is the economic driver for schools.

Table 5
Commercial Building Classifications

Building Type	SIC Codes Included
Small Office < 30,000 Square Feet	071,074, 076, 078, 60-61, 62-67, 73
Restaurants	58
Retail Stores	52, 53, 55-57 (554), 59 (592)*
Food/Liquor Stores	54, 592
Warehouses	42 (421,4222,423), 50, 51 (514)
Refrigerated Warehouses	4222, 514
Schools	821, 835
Colleges/Trades	822, 824, 829
Health Care	805-809, 836
Hotel/Motel	70 (703)
Miscellaneous	072, 075, 554, 703, 72, 75, 78, 79, 823, 84, 92 (925)
Large Office >= 30,000 Square Feet	801-804, 81, 83 (836), 87, 89, 91, 93-96, 972

*Excluded industry subgroups in parentheses.

For each building type, energy consumption occurs within ten different end uses. **Table 6** displays the end uses and their corresponding fuel types.

Table 6
Commercial End Use and Fuel Type Classifications

End-Use	Description	Electricity	Natural Gas
Space Heat	Combinations of packaged and system space heat	X	X
Space Cooling	Combinations of packaged and system cooling	X	X
Ventilation	Ventilation systems	X	
Water heating	Water heaters and system boilers	X	X
Cooking	Major cooking appliances	X	X
Refrigeration	Major refrigeration systems and stand alone units	X	X
Indoor Lighting	Lighting systems, does not include desktop lamps	X	
Outdoor Lighting	Lighting systems	X	
Office Equipment	Faxes, computers, copiers, etc.	X	
Misc. Equipment	Miscellaneous plug load, including small refrigerators, desktop lamps, and other non-system energy using equipment.	X	X

The model keeps track of both building and equipment vintages as well as equipment replacement rates. All post 1978 floor space subject to the provisions of Title 24 enters the energy equation with modified marginal end use intensities. New equipment in older buildings is replaced with higher efficiency equipment as the Title 20 standards phase-in.

Energy prices affect energy use in two ways. In the short run, users' options are limited to reducing their uses of energy services, switching to different fuel (unlikely in the commercial building sector), and implementing low cost conservation measures such as insulation, solar films, shade screens, delamping, etc. In the long run, a wider variety of options are available. In addition to the short run options, for existing buildings the users can replace inefficient equipment with more efficient ones, in new buildings the users can choose different energy service and/or commercial service technologies, switch fuels, and implement costlier conservation measures. The model keeps track of the retirement and replacement of buildings and equipment by vintage through decay functions. Thus, the energy use effects of the replacement of decayed equipment with newer and more efficient ones can be estimated.

Industrial Sector

The Energy Commission uses the Industrial End Use Forecasting Model (INFORM) originally developed by the Electric Policy Research Institute (EPRI). The model allows accounting for energy use trends, price effects, and exogenous improvement in efficiency by end use and industry. The largest end uses are process energy, motors, and lighting. The key driver for the energy forecast is the value of shipments forecast developed by staff from UCLA and Global Insight inputs. Price response is modeled using a three year average energy price in which an energy price index for each industry is calculated based on their relative use of electricity, natural gas, and petroleum products.

Table 7
Industrial Sector Definitions By SIC Code

SIC	Industry
Mining	
10	Metal Mining
13	Oil and Gas Extraction
14	Mining and Quarrying of Non-Metallic Minerals
Manufacturing - Process Industries	
15	Construction
203	Canned, Frozen, Preserved Fruits, Vegetables, and Food Specialties
206	Sugar and Confectionery Products
24	Lumber and Wood Products
261	Pulp Mills
262-3	Paper and Paperboard Mills
29	Petroleum Refining and Related Industries
321-3	Glass and Glassware
324	Cement
Manufacturing - Assembly Industries	
20x	Food and Kindred Products (Except 203 and 206)
22	Textile Mill Products
23	Apparel and Other Textile Products
25	Furniture and Fixtures
26x	Paper and Allied Products (Except Pulp, Paper, and Paperboard Mills 261-263)
27	Printing and Publishing
28	Chemicals and Allied Products
308	Plastics Products
30x	Rubber Products
31	Leather and Leather Products
32x	Stone and Clay Products
33	Primary Metal Industries
34	Fabricated Metal Products
357	Computers and Office Equipment
35x	Industrial Machinery and Equipment (Except 357)
366	Communications Equipment
367	Electronic Components and Accessories
36x	Electronic and Other Electric Equipment (Except 366, 367)
37	Transportation Equipment
38	Instruments and Related Products
39	Miscellaneous Manufacturing

Agriculture and Water Pumping

The agricultural electricity usage model is divided into four sectors: (1) groundwater pumping, (2) surface water pumping, (3) dairy and livestock production, and (4) urban water usage. Irrigation water pumping for crop production is the most important electricity use. Four separate econometric models have been developed to forecast energy consumption in these four sectors. These models are applied to energy consumption in the PG&E, SCE, and SDG&E planning areas.

In the groundwater and surface water pumping models the amount of energy usage is forecast on the basis of the amount of total agricultural production (field crops, vegetables and lemons, and fruits and nuts), price of electricity, the amount of rainfall, and other variables deemed necessary to account for possible structural breaks in the relationships.

In the dairy and livestock sector, energy consumption is related to the amounts of dairy and livestock production, price of electricity, and other variables to take account of possible regime shifts. The levels of these input variables are forecast separately by relating them to economic and demographic variables such as real household income.

Historically there has been a strong correlation between energy usage by urban households and the total number of homes in different planning areas. This correlation is used to forecast energy consumption in this sector using econometric models.

For other smaller planning areas simpler time-series models, such as trend analysis, are employed to forecast energy usage.

TCU and Street lighting

The Transportation, Communication and Utilities (TCU) category includes SIC codes 40-49, with exceptions, 97 and 752 (**Table 4-1**). SICs 40-49 consists of establishments providing such services as passenger and freight transportation, communications services, electricity, gas, steam, water or sanitary services, and the United States Postal Service. These industries have establishments that have activities, workers, and physical facilities distributed over an extensive geographic area. Electricity and natural gas energy use is primarily in offices, passenger and cargo terminals, maintenance facilities, for pumping, broadcasting, transmission and distribution.

SIC 97 consists of government establishments engaged in national security and international affairs. Energy use is primarily for offices and process activities such as metal fabrication of structural assemblies, components for ships and aircraft, and operation of electronic equipment. SIC 752 consists of establishments primarily engaged in the temporary parking of automobiles.

The TCU forecast model is an accounting model. There are two growth factors for each industry: one for a driving variable and one for energy intensity. The driving variable is the ratio of selected industry growth variables in a future year to the base year. The majority of TCU industries are driven by the growth factor for the number of jobs in that industry. Examples of other driving variables include growth factor of the number of households for SIC 489, growth factor of the petroleum refining production index for SIC 46 and growth factor of the total population for SIC 495. Energy intensity is the ratio of the energy demand per unit of growth variable for a future year compared to the base year. It accounts for increases in electricity demand as industrial activity becomes more energy intensive.

Table 8
TCU Drivers

SIC	Driver Variable
40 (Railroad Transport)	The number of jobs in SIC 40.
411 (Rapid Transit)	Total population.
412-417 (Other Local Transportation)	The number of jobs in SIC 41.
752 (Automobile Parking)	Square footage of commercial parking garage floor space.
421,423 (Trucking And Courier Services)	The number of jobs in SIC 42.
43 (U.S. Postal Service)	The number of jobs in SIC 43.
441-448 (Water Transportation)	The number of jobs in SIC 44.
449 (Water Transportation/Marine Services)	The number of jobs in SIC 44.
451-452 (Certified And Noncertified Air Transport)	The number of jobs in SIC 45.
458 (Air Transport Fields And Terminals)	The number of jobs in SIC 45.
46 (Petroleum Pipelines)	The number of jobs in SIC 46.
47 (Transportation Services)	The number of jobs in SIC 47.
481 (Telephone Communications)	Total number of non-agricultural wage and salary jobs.
482 (Telegraph Communications)	The number of jobs in SIC 48.
483 (Radio And TV Broadcasting)	Total number of households.
484 & 489 (Cable TV)	Total number of households.
491-493, & 496 (Elec. & Gas Services, Steam Supply)	The number of jobs in SIC 49.
495 (Sewerage Facilities)	Total population.
97 (National Defense)	The total number of Federal Defense jobs.

The street lighting energy model presumes a fixed linear relationship between the number of households and "basic" street lighting electricity consumption. Basic forecasted electricity consumption is reduced by projected conservation in street lighting (luminaire replacement with more efficient bulbs). These conservation savings are calculated using estimates of utility and municipal street lighting retrofit program expenditures in the planning area.

Energy Requirements Summary Model

Individual sectoral model energy demand forecasts are combined in the Energy Requirements Summary Model to calculate final planning area total forecasts. The summary model adjusts the sectoral forecasts for weather, adds or subtracts minor conservation program savings, and calibrates the adjusted results to historical consumption.

Weather adjustments are made to the residential and commercial building models because these models forecast (and backcast) on the basis of long-run normal weather. The raw sectoral model backcast and recorded energy consumption are not directly comparable due to the influence of abnormal weather on actual consumption. Energy demand for weather sensitive end uses is adjusted to accommodate the deviation between actual weather and normal weather for each climate zone in the planning area. After this step, the adjusted forecast and the actual consumption data match closely.

Minor adjustments to the weather adjusted raw backcast and forecast are performed to account for the influence of conservation programs that have not been incorporated into the structure or input data used within the sectoral models.

Finally, the adjusted sectoral results are calibrated based on the differences between the adjusted results and estimates of actual consumption. This calibration is based upon a uniformly weighted multi-year scaling factor. The period 1980-2001 is used for deriving calibration factors for most utilities and most sectors. Consumption estimates are based upon sales in the utility planning area and private supply (principally self-generation) data as submitted to the Energy Commission by each utility via the ***Quarterly Fuel and Energy Report*** (QFER). Special reliance is placed upon the SIC forms which allow aggregation of individual business activities to control total definitions which exactly match the customer sector model.

Electricity consumption needs that are met by self-generation or distributed generation reduce the demands on the grid. After several years of no growth, privately supplied energy appears to be increasing. This is a result of the energy crisis, changes in the regulatory environment, and higher rates, but it is not clear this more favorable environment will continue. To account for increases in private supply in the forecast, peak load and consumption for 2002 and 2003 were estimated by sector and planning area based on data from PG&E, SCE and SDG&E on new interconnect activity in their territories. After 2003, privately supplied load is assumed to grow at the same rate as the corresponding sector forecast for each utility. This consevative estimate is used because of the uncertainty of regulatory policy such as exit fees on the economic attractiveness of self generation.

Peak Demand Model

The Energy Commission uses the Hourly Electric Load Model (HELM) to forecast peak based on the end use electricity demand projections of the individual energy models. Projecting peak load is more difficult than projecting energy consumption because instantaneous electricity requirements change constantly. Appliances are used more during the day than in the middle of the night (hour), lights are on more in the winter than in the summer (season), and refrigerators run more often in hot weather (temperature). Moreover, recorded data for customer load consists only of system load; relatively little sector load information is known exactly.

HELM forecasts hourly end use demand for every day of the year. Peak days and peak hours within peak days are then determined by seeking the maximum from many individual hourly load forecasts. This method allows peak load to be directly determined from energy forecasts rather than constrained to follow past consumption patterns.

For the residential and commercial building sectors, end uses are divided into weather-varying (space heating and air conditioning) and season-varying (all others) groups. The estimates of average daily electricity consumption for each season varying end uses are based on analysis of past utility sales. For example, daily refrigerator consumption is about twenty percent higher (lower) than average in the summer (winter). Daily weather sensitive end use demand is distributed to each day and hour according to weather conditions and space conditioning equipment operating schedules. Summation of each end use load at any given hour produces an overall customer level load.

Industrial, other commercial, agriculture, and street lighting loads are forecasted by individual industry. Annual electricity sales are allocated to the day being forecast using utility billing data and load curves that distribute daily electricity to hourly loads. In most cases (food processing is one exception) industrial load curves are assumed to have the same shape during all weekdays of each month. The model currently assumes that industry operating patterns of shifts, weekdays versus weekends, will not change throughout the forecast period.

The hourly load model described above operates in the same manner in both backcasting and forecasting modes. Customer loads are adjusted to represent system load by adding transmission and distribution losses. For example, in the PG&E planning area, the loss factor is 1.076. Peak demand is simply the maximum hourly load (summed over all sectors) on the peak day—usually a summer day—for each forecast year adjusted for transmission and distribution losses. In the backcast mode, the weather from the actual peak event (1980-2002) is fed into the model for the corresponding year. In the forecast mode, HELM uses a synthetic weather year developed by a ranked-average methodology from 30 years of historic weather data.

Load and Temperature

In addition to the peak demand forecast for normal weather, the Energy Commission has developed several hot weather demand scenarios for varying degrees of hotter than average temperatures. To account for summer heat buildup, staff uses a three-day moving average of the maximum temperatures to correlate with the system summer loads. This moving average is calculated as 60 percent of the current day's maximum temperature, 30 percent of the previous day's maximum temperature and 10 percent of the second previous day's maximum temperature.

The baseline peak demand forecast assumes average temperatures—temperatures that are expected to occur, on average, in one out of every two years (one-in-two). To account for warmer than average temperatures, temperature sensitivities for 1-in-five, -ten, -twenty and -forty weather conditions are applied to the baseline peak demand forecast. Temperatures are weighted based on distribution of air conditioning throughout the state.

Figure 1 shows the statewide temperature thresholds for the 1-10, 1-in-20, and 1-in-40 scenarios, with maximum temperatures typically in late July to mid-August. However, the state can be thought of as three temperature regions; north, south and San Diego. San Diego has been differentiated from the rest of southern California due to its mild climate. **Figures 2 and 3** provide the average (1-in-2) daily summer temperatures as well as the 1-10, 1-in-20, and 1-in-40 maximum temperature thresholds for the north and south regions respectively. Figures 2 and 3 show the temperatures in the south region are more likely to be hotter later in the summer period than in the north region.

More detailed information on historic temperatures and load can be found in **Appendix L**.

Figure 1
Statewide Daily 3-Day Moving Average Temperature Thresholds

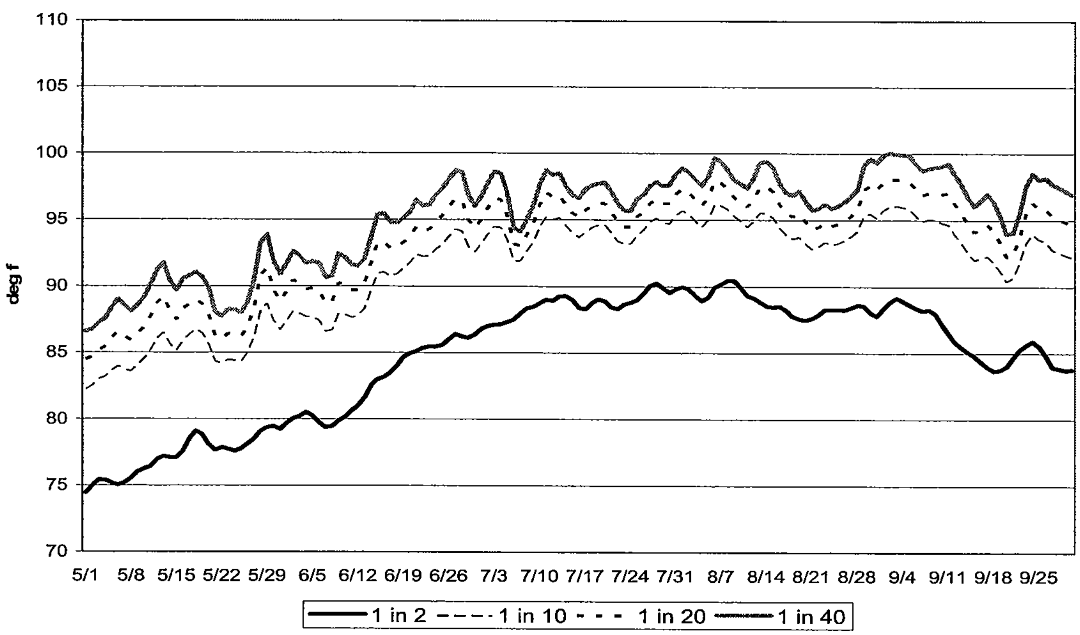


Figure 2
North Region Daily 3-Day Moving Average Temperature Thresholds

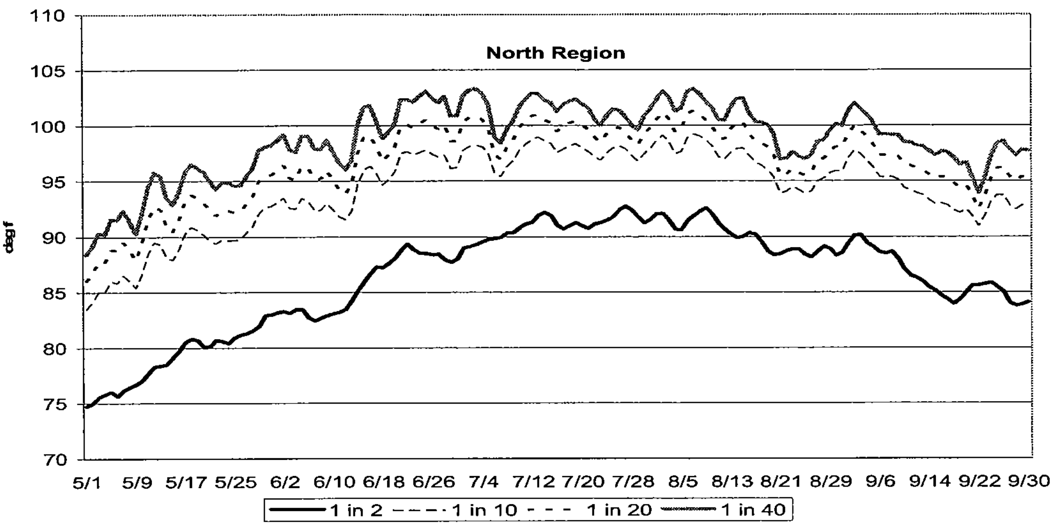
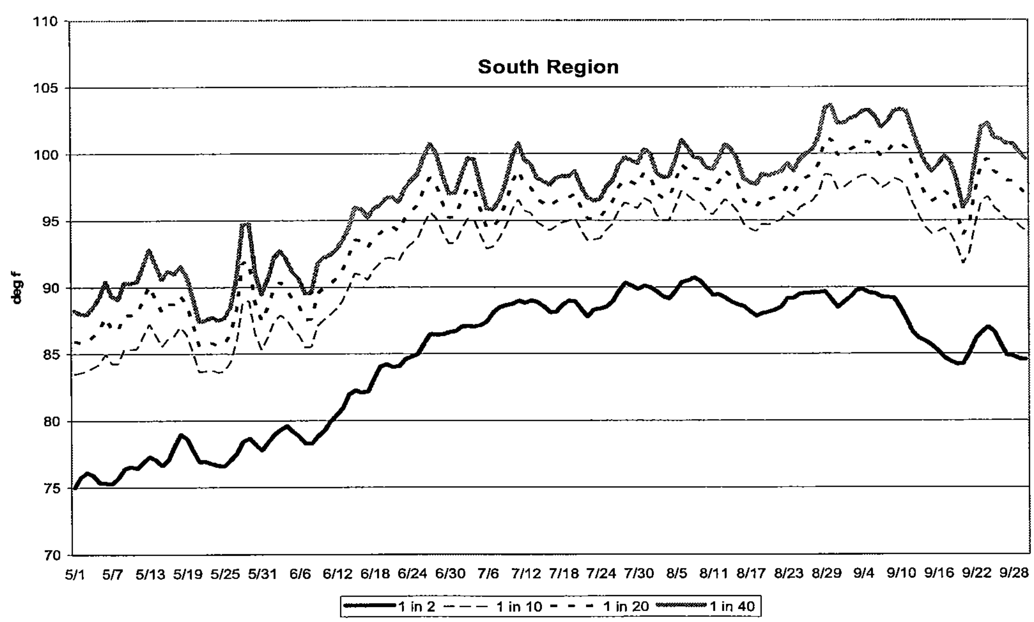


Figure 3
South Region Daily 3-Day Moving Average Temperature Thresholds



Overview of Appendices

Appendix A: Electricity Consumption by Sector
This appendix provides recorded and forecast electricity consumption by sector and by utility. **Table A-11** shows sales by customer category: direct access, IOU, or municipal.

Appendix B: Net Energy for Load
This appendix provides recorded and forecast net energy for load by utility and by CAISO Zone.

Appendix C: Peak Demand by Sector
This appendix provides recorded and forecast peak demand, before losses, by sector and by utility.

Appendix D: System Peak Demand
This appendix provides recorded and forecast system peak demand by utility, and tables showing the CAISO congestion zone forecast for normal and hot weather and economic scenarios.

Appendix E: Natural Gas Consumption
This appendix provides recorded and forecast natural gas consumption by sector and by utility.

Appendix F: Economic and Demographic Drivers
This appendix includes the forecasts of population, households, employment, industrial shipments, and personal income used for the forecast.

Appendix G: Energy Price Forecasts
This appendix includes the electricity rate and natural gas price forecasts used.

Appendix H: Detailed Residential Sector Forecast
This appendix includes consumption and appliance saturations by end use for selected years.

Appendix I: Detailed Commercial Sector Forecast
This appendix includes electricity consumption and use per square foot by end use and building type, and the forecast of floor space stock and additions.

Appendix J: Detailed Industrial, Agriculture, and TCU Sector Forecast
This appendix reports the electricity forecast by SIC and planning area, for select years.

Appendix K: Conservation Savings
This appendix includes cumulative energy savings forecast through 2013 from both building and appliance standards, and savings through 2013 from energy efficiency programs funded through 2001.

Appendix L: Load and Temperature
This appendix includes temperature data used to develop hot weather scenarios, and data and charts for five years of CAISO loads and maximum temperatures.

Table A-1
Staff's Outlook for the PG&E Planning Area
Electricity Consumption by Sector (GWh)

Year	Residential	Commercial	Industrial	Mining	Agricultural	Other	Electric Vehicles	Total Consumption
1980	21,424	16,723	16,565	2,006	5,743	3,736	0	66,197
1981	21,632	17,732	15,677	2,482	6,318	3,812	0	67,653
1982	21,116	17,818	14,909	2,955	5,237	4,007	0	66,043
1983	21,858	18,790	15,725	3,155	4,879	4,091	0	68,497
1984	22,883	19,716	16,442	3,454	6,319	4,527	0	73,341
1985	23,292	20,434	16,918	3,776	6,319	4,877	0	75,617
1986	23,180	21,023	17,344	3,192	5,301	4,355	0	74,394
1987	24,278	22,583	17,993	3,171	6,048	4,889	0	78,962
1988	25,041	23,749	18,869	3,247	6,398	4,838	0	82,141
1989	25,389	25,246	19,201	3,215	6,482	4,996	0	84,529
1990	25,844	26,411	19,727	3,221	6,518	5,085	0	86,806
1991	26,308	26,734	19,405	3,360	5,893	5,230	0	86,929
1992	26,412	27,681	19,439	3,395	6,083	5,316	0	88,326
1993	26,781	28,059	19,775	3,352	5,855	5,419	0	89,239
1994	27,013	28,204	19,883	3,368	5,778	5,336	0	89,582
1995	27,080	28,882	20,872	3,104	5,385	5,440	0	90,763
1996	28,120	29,909	20,686	3,500	5,728	5,521	0	93,464
1997	28,599	31,624	21,839	3,623	5,980	5,413	0	97,078
1998	29,596	30,334	22,131	3,262	5,105	5,255	0	95,682
1999	30,521	32,630	21,697	3,085	6,008	5,265	0	99,205
2000	31,646	33,896	21,810	3,085	6,007	5,537	0	101,980
2001	29,792	32,142	22,270	3,086	6,036	5,421	0	98,748
2002	30,360	32,381	20,308	2,951	6,197	5,372	1	97,570
2003	30,780	32,886	20,258	2,948	6,288	5,434	3	98,597
2004	31,360	34,125	20,340	2,939	6,623	5,548	6	100,940
2005	31,989	34,770	21,070	2,955	6,674	5,647	9	103,115
2006	32,631	35,489	21,519	2,967	6,737	5,746	13	105,101
2007	33,301	35,999	21,741	2,935	6,767	5,840	16	106,599
2008	34,154	36,851	22,011	2,942	6,790	5,931	20	108,699
2009	34,833	37,309	22,111	2,934	6,810	6,032	24	110,053
2010	35,557	37,945	22,258	2,906	6,835	6,124	30	111,655
2011	36,116	38,451	22,461	2,942	6,849	6,229	40	113,087
2012	36,716	38,986	22,604	2,910	6,866	6,309	50	114,441
2013	37,310	39,306	22,716	2,878	6,852	6,385	60	115,507
Annual Growth Rates (%)								
1980-1990	1.9	4.7	1.8	4.9	1.3	3.1		2.7
1990-2000	2.0	2.5	1.0	-0.4	-0.8	0.9		1.6
2000-2003	-0.9	-1.0	-2.4	-1.5	1.5	-0.6		-1.1
2003-2008	2.1	2.3	1.7	0.0	1.5	1.8	46.1	2.0
2008-2013	1.8	1.3	0.6	-0.4	0.2	1.5	24.6	1.2
2003-2013	1.9	1.8	1.2	-0.2	0.9	1.6	34.9	1.6

Table A-2
Staff's Outlook for the SMUD Area
Electricity Consumption by Sector (GWh)

Year	Residential	Commercial	Industrial	Mining	Agricultural	Other	Electric Vehicles	Total Consumption
1980	2,587	1,988	269	54	112	340	0	5,350
1981	2,794	2,055	272	62	122	387	0	5,693
1982	2,781	2,088	264	63	108	377	0	5,681
1983	2,910	2,120	301	68	94	462	0	5,954
1984	3,086	2,234	376	76	113	475	0	6,360
1985	3,193	2,452	499	86	115	536	0	6,881
1986	3,107	2,673	542	87	102	503	0	7,014
1987	3,229	3,004	443	99	115	529	0	7,419
1988	3,326	3,044	542	90	106	567	0	7,677
1989	3,359	3,134	639	86	98	612	0	7,927
1990	3,611	3,214	683	88	108	654	0	8,358
1991	3,603	3,151	692	95	120	688	0	8,349
1992	3,626	3,277	718	64	131	679	0	8,496
1993	3,636	3,290	696	64	134	615	0	8,435
1994	3,662	3,287	689	66	146	568	0	8,418
1995	3,604	3,340	683	74	140	616	0	8,458
1996	3,808	3,411	732	80	151	624	0	8,805
1997	3,839	3,537	731	86	164	649	0	9,006
1998	3,959	3,537	779	83	125	640	0	9,123
1999	3,966	3,650	822	88	162	639	0	9,326
2000	4,135	3,698	811	88	147	612	0	9,491
2001	3,960	3,825	771	90	145	542	0	9,334
2002	4,059	3,895	685	90	159	541	0	9,429
2003	4,105	3,975	679	91	162	550	1	9,563
2004	4,173	4,049	688	93	165	558	2	9,729
2005	4,248	4,116	710	93	168	567	4	9,906
2006	4,322	4,167	726	93	171	577	5	10,060
2007	4,396	4,208	750	94	174	587	6	10,214
2008	4,486	4,255	773	94	177	596	8	10,388
2009	4,563	4,305	794	92	180	605	9	10,548
2010	4,643	4,357	810	90	183	615	12	10,710
2011	4,714	4,409	830	89	185	625	16	10,869
2012	4,788	4,459	846	87	188	634	20	11,022
2013	4,864	4,505	861	84	191	643	23	11,172

Annual Growth Rates (%)

1980-1990	3.4	4.9	9.8	4.9	-0.4	6.8		4.6
1990-2000	1.4	1.4	1.7	0.0	3.2	-0.7		1.3
2000-2003	-0.2	2.4	-5.7	1.0	3.1	-3.5		0.3
2003-2008	1.8	1.4	2.6	0.6	1.8	1.6	46.1	1.7
2008-2013	1.6	1.1	2.2	-2.1	1.6	1.5	24.6	1.5
2003-2013	1.7	1.3	2.4	-0.8	1.7	1.6	34.9	1.6

Table A-3
Staff's Outlook for the SCE Area
Electricity Consumption by Sector (GWh)

Year	Residential	Commercial	Industrial	Mining	Agricultural	Other	Electric Vehicles	Total Consumption
1980	16,965	16,778	16,827	2,735	3,500	2,819	0	59,624
1981	17,710	17,475	16,938	2,860	3,753	2,859	0	61,594
1982	17,389	17,243	15,732	2,703	3,231	3,202	0	59,501
1983	18,205	18,037	16,399	2,623	3,423	3,319	0	62,006
1984	19,395	19,286	16,833	3,034	4,616	3,444	0	66,608
1985	19,751	19,882	17,257	3,046	4,667	3,601	0	68,203
1986	19,877	20,845	17,588	2,801	4,623	3,762	0	69,496
1987	20,894	22,025	18,548	2,752	4,816	3,965	0	72,999
1988	22,124	23,137	19,694	2,793	4,868	4,082	0	76,698
1989	22,620	24,354	19,922	2,803	4,359	4,360	0	78,417
1990	23,684	25,702	19,716	2,827	5,240	4,505	0	81,673
1991	23,039	25,585	19,151	2,738	5,231	4,480	0	80,223
1992	24,210	26,835	19,287	2,539	4,443	4,727	0	82,041
1993	23,362	26,800	18,961	2,474	4,871	4,664	0	81,133
1994	24,190	26,785	18,714	2,309	5,355	5,447	0	82,800
1995	24,097	27,097	19,146	2,366	4,482	5,667	0	82,855
1996	24,738	28,252	19,742	2,648	5,048	5,300	0	85,728
1997	25,270	29,574	20,458	2,593	5,231	5,256	0	88,382
1998	25,749	29,488	20,293	2,577	5,192	5,136	0	88,434
1999	25,726	30,339	22,252	2,730	5,163	4,804	0	91,013
2000	27,980	32,401	23,207	2,805	5,154	4,949	0	96,496
2001	26,132	31,298	20,326	2,596	5,270	4,883	0	90,506
2002	26,353	31,519	18,927	2,495	5,450	4,669	6	89,418
2003	26,746	32,059	18,809	2,501	5,572	4,715	17	90,419
2004	27,245	33,445	19,067	2,505	5,742	4,776	34	92,813
2005	27,789	34,468	19,879	2,523	5,864	4,832	50	95,406
2006	28,382	35,223	20,535	2,536	5,981	4,910	70	97,637
2007	28,970	35,517	20,916	2,515	6,110	4,983	90	99,100
2008	29,719	35,914	21,179	2,523	6,244	5,053	112	100,745
2009	30,317	36,215	21,345	2,522	6,381	5,124	134	102,038
2010	30,955	36,502	21,554	2,502	6,520	5,194	168	103,395
2011	31,513	36,912	21,847	2,533	6,653	5,272	224	104,956
2012	32,088	37,512	22,022	2,509	6,790	5,340	280	106,541
2013	32,651	37,684	22,193	2,484	6,898	5,407	336	107,654
Annual Growth Rates (%)								
1980-1990	3.4	4.4	1.6	0.3	4.1	4.8		3.2
1990-2000	1.7	2.3	1.6	-0.1	-0.2	0.9		1.7
2000-2003	-1.5	-0.4	-6.8	-3.8	2.6	-1.6		-2.1
2003-2008	2.1	2.3	2.4	0.2	2.3	1.4	46.1	2.2
2008-2013	1.9	1.0	0.9	-0.3	2.0	1.4	24.6	1.3
2003-2013	2.0	1.6	1.7	-0.1	2.2	1.4	34.9	1.8

Table A-4
Staff's Outlook for the LADWP Area
Electricity Consumption by Sector (GWh)

Year	Residential	Commercial	Industrial	Mining	Agricultural	Other	Electric Vehicles	Total Consumption
1980	5,357	6,975	3,746	322	113	1,155	0	17,669
1981	5,587	7,293	3,781	349	137	1,192	0	18,340
1982	5,529	7,263	3,722	348	125	1,197	0	18,184
1983	5,794	7,457	3,697	389	112	1,273	0	18,722
1984	6,157	8,009	3,829	365	156	1,261	0	19,777
1985	6,092	8,180	3,723	359	145	1,260	0	19,760
1986	6,033	8,604	3,731	312	137	1,276	0	20,094
1987	6,222	9,010	3,649	301	157	1,434	0	20,772
1988	6,482	9,279	3,761	267	202	1,449	0	21,439
1989	6,601	9,350	3,698	229	180	1,497	0	21,555
1990	6,835	9,769	3,534	199	156	1,479	0	21,971
1991	6,620	9,606	3,553	204	133	1,518	0	21,635
1992	7,000	9,832	3,400	179	155	1,487	0	22,052
1993	6,726	10,381	3,349	170	130	1,641	0	22,396
1994	6,723	9,894	3,210	190	150	1,639	0	21,805
1995	6,788	10,342	3,242	314	140	1,699	0	22,526
1996	6,917	10,056	3,604	346	175	1,660	0	22,758
1997	7,106	10,472	3,316	323	179	1,771	0	23,166
1998	7,183	10,396	3,356	323	173	1,572	0	23,004
1999	7,140	10,484	3,329	283	223	1,600	0	23,058
2000	7,519	10,787	3,312	270	181	1,733	0	23,803
2001	7,313	10,445	3,195	263	173	1,876	0	23,265
2002	7,177	10,971	3,089	254	181	1,773	2	23,448
2003	7,227	11,153	3,100	255	183	1,778	6	23,703
2004	7,296	11,329	3,112	255	184	1,783	13	23,972
2005	7,380	11,461	3,217	256	185	1,787	19	24,306
2006	7,479	11,549	3,268	257	186	1,803	27	24,570
2007	7,572	11,616	3,256	256	187	1,817	35	24,739
2008	7,704	11,684	3,231	256	189	1,828	43	24,935
2009	7,799	11,755	3,172	255	190	1,839	52	25,062
2010	7,899	11,813	3,165	253	192	1,851	65	25,239
2011	7,989	11,880	3,174	256	193	1,870	86	25,448
2012	8,078	11,942	3,153	254	194	1,879	108	25,609
2013	8,166	12,072	3,135	252	197	1,888	130	25,839
Annual Growth Rates (%)								
1980-1990	2.5	3.4	-0.6	-4.7	3.2	2.5		2.2
1990-2000	1.0	1.0	-0.6	3.1	1.5	1.6		0.8
2000-2003	-1.3	1.1	-2.2	-1.9	0.3	0.9		-0.1
2003-2008	1.3	0.9	0.8	0.1	0.7	0.6	46.1	1.0
2008-2013	1.2	0.7	-0.6	-0.4	0.9	0.6	24.6	0.7
2003-2013	1.2	0.8	0.1	-0.1	0.8	0.6	34.9	0.9

Table A-5
Staff's Outlook for the SDG&E Area
Electricity Consumption by Sector (GWh)

Year	Residential	Commercial	Industrial	Mining	Agricultural	Other	Electric Vehicles	Total Consumption
1980	3,879	3,618	936	68	195	1,033	0	9,729
1981	3,848	3,682	988	77	229	1,051	0	9,875
1982	3,858	3,661	957	80	197	1,070	0	9,823
1983	3,909	3,827	963	89	197	1,089	0	10,073
1984	4,056	4,214	1,098	104	241	1,047	0	10,760
1985	4,249	4,411	1,143	107	215	1,053	0	11,180
1986	4,323	4,830	1,164	111	226	1,015	0	11,670
1987	4,638	5,088	1,243	100	215	1,084	0	12,367
1988	4,928	5,254	1,357	102	240	1,356	0	13,237
1989	5,144	5,597	1,418	136	254	1,379	0	13,929
1990	5,421	5,985	1,550	180	240	1,422	0	14,798
1991	5,333	5,889	1,531	170	207	1,510	0	14,641
1992	5,609	6,429	1,575	163	213	1,550	0	15,540
1993	5,549	6,435	1,538	128	212	1,588	0	15,451
1994	5,729	6,548	1,540	112	233	1,629	0	15,791
1995	5,734	6,690	1,509	136	229	1,625	0	15,923
1996	5,935	7,016	1,696	139	258	1,557	0	16,601
1997	6,123	7,377	1,593	123	283	1,633	0	17,132
1998	6,319	7,777	1,604	113	218	1,599	0	17,630
1999	6,453	8,099	1,781	109	241	1,629	0	18,312
2000	6,513	8,137	2,261	141	244	1,495	0	18,791
2001	6,116	8,019	1,752	116	233	1,587	0	17,822
2002	6,549	8,437	1,442	116	265	1,564	1	18,374
2003	6,682	8,570	1,441	114	274	1,580	2	18,663
2004	6,826	8,800	1,467	113	284	1,606	4	19,099
2005	6,985	8,996	1,520	113	293	1,629	5	19,541
2006	7,137	9,204	1,571	112	301	1,656	8	19,988
2007	7,292	9,329	1,616	112	308	1,680	10	20,347
2008	7,488	9,550	1,665	112	315	1,705	12	20,847
2009	7,646	9,662	1,709	113	320	1,729	15	21,194
2010	7,801	9,761	1,745	113	324	1,747	18	21,510
2011	7,935	9,887	1,793	113	328	1,767	24	21,847
2012	8,076	10,078	1,824	113	332	1,786	31	22,240
2013	8,218	10,154	1,854	113	337	1,807	37	22,518
Annual Growth Rates (%)								
1980-1990	3.4	5.2	5.2	10.2	2.1	3.2		4.3
1990-2000	1.9	3.1	3.8	-2.4	0.2	0.5		2.4
2000-2003	0.9	1.7	-14.0	-6.7	3.9	1.9		-0.2
2003-2008	2.3	2.2	2.9	-0.4	2.8	1.5	46.1	2.2
2008-2013	1.9	1.2	2.2	0.1	1.4	1.2	24.6	1.6
2003-2013	2.1	1.7	2.6	-0.1	2.1	1.3	34.9	1.9

Table A-6
Staff's Outlook for the BGP Area
Electricity Consumption by Sector (GWh)

Year	Residential	Commercial	Industrial	Mining	Agricultural	Other	Electric Vehicles	Total Consumption
1980	616	1,058	591	12	12	85	0	2,374
1981	641	1,122	584	12	9	84	0	2,452
1982	647	1,123	522	12	9	86	0	2,399
1983	681	1,108	506	21	21	95	0	2,433
1984	730	1,207	560	18	32	97	0	2,644
1985	715	1,272	557	22	32	100	0	2,699
1986	714	1,273	554	23	30	102	0	2,695
1987	735	1,284	569	23	34	110	0	2,754
1988	783	1,344	569	29	36	100	0	2,861
1989	785	1,331	532	32	37	96	0	2,813
1990	858	1,425	497	39	33	99	0	2,951
1991	797	1,408	392	37	29	97	0	2,759
1992	842	1,552	369	38	28	102	0	2,931
1993	825	1,680	316	39	28	108	0	2,996
1994	839	1,689	288	42	30	110	0	2,999
1995	862	1,785	245	44	33	116	0	3,084
1996	875	1,877	224	47	29	100	0	3,152
1997	889	1,921	229	40	28	128	0	3,236
1998	896	1,973	233	49	27	120	0	3,298
1999	876	1,974	220	35	27	107	0	3,240
2000	903	2,023	204	46	27	118	0	3,320
2001	902	1,976	191	51	28	128	0	3,275
2002	894	2,070	177	50	29	123	0	3,343
2003	898	2,101	178	50	29	124	1	3,380
2004	904	2,137	182	50	29	125	1	3,429
2005	911	2,162	189	50	29	127	2	3,471
2006	920	2,178	195	50	29	129	3	3,504
2007	928	2,175	198	50	29	131	4	3,516
2008	941	2,173	200	50	29	132	5	3,530
2009	949	2,173	201	50	29	134	6	3,542
2010	958	2,171	202	50	29	136	7	3,555
2011	967	2,171	205	50	29	138	10	3,570
2012	975	2,171	205	50	29	140	12	3,582
2013	983	2,168	206	49	29	142	14	3,592
Annual Growth Rates (%)								
1980-1990	3.4	3.0	-1.7	12.3	10.6	1.5		2.2
1990-2000	0.5	3.6	-8.5	1.5	-2.2	1.8		1.2
2000-2003	-0.2	1.3	-4.4	2.8	3.2	1.7		0.6
2003-2008	0.9	0.7	2.3	0.1	0.0	1.3	46.1	0.9
2008-2013	0.9	0.0	0.6	-0.3	0.0	1.4	24.6	0.4
2003-2013	0.9	0.3	1.5	-0.1	0.0	1.4	34.9	0.6

Table A-7
Staff's Outlook for the Other Area
Electricity Consumption by Sector (GWh)

Year	Residential	Commercial	Industrial	Mining	Agricultural	Other	Electric Vehicles	Total Consumption
1980	1,253	782	242	15	273	113	0	2,677
1981	1,282	825	236	14	297	128	0	2,781
1982	1,253	815	178	16	270	127	0	2,660
1983	1,221	792	150	21	276	135	0	2,595
1984	1,257	818	184	26	296	141	0	2,722
1985	1,235	840	175	27	333	159	0	2,770
1986	1,218	863	181	39	289	168	0	2,758
1987	1,272	895	161	28	307	210	0	2,872
1988	1,349	937	182	33	318	237	0	3,055
1989	1,418	965	184	35	305	298	0	3,205
1990	1,414	977	162	41	383	333	0	3,310
1991	1,443	1,002	154	42	332	350	0	3,323
1992	1,526	1,087	141	69	342	349	0	3,513
1993	1,545	1,128	149	76	317	387	0	3,602
1994	1,618	1,201	152	60	320	407	0	3,758
1995	1,606	1,221	155	62	349	426	0	3,819
1996	1,772	1,217	171	62	362	400	0	3,983
1997	1,721	1,264	173	59	364	391	0	3,972
1998	1,685	1,294	175	50	363	344	0	3,911
1999	1,802	1,362	173	52	381	239	0	4,009
2000	1,917	1,442	179	59	400	231	0	4,227
2001	1,909	1,423	171	46	425	256	0	4,230
2002	1,944	1,378	159	42	400	273	0	4,196
2003	1,977	1,399	151	42	409	284	0	4,262
2004	2,011	1,449	150	43	417	312	0	4,381
2005	2,045	1,482	152	43	424	319	0	4,466
2006	2,080	1,517	154	43	431	355	0	4,580
2007	2,116	1,545	155	44	438	342	0	4,639
2008	2,152	1,585	154	44	445	360	0	4,740
2009	2,189	1,610	154	43	452	379	0	4,828
2010	2,226	1,642	153	43	459	456	0	4,979
2011	2,264	1,668	153	43	466	507	0	5,100
2012	2,303	1,695	152	42	473	593	0	5,257
2013	2,342	1,712	151	41	479	689	0	5,415

Annual Growth Rates (%)

1980-1990	1.2	2.2	-3.9	10.9	3.5	11.4		2.1
1990-2000	3.1	4.0	1.0	3.6	0.4	-3.6		2.5
2000-2003	1.0	-1.0	-5.5	-10.4	0.7	7.2		0.3
2003-2008	1.7	2.5	0.4	0.7	1.7	4.9		2.2
2008-2013	1.7	1.6	-0.4	-1.2	1.5	13.8		2.7
2003-2013	1.7	2.0	0.0	-0.2	1.6	9.3		2.4

Table A-8
Staff's Outlook for the DWR Area
Electricity Consumption by Sector (GWh)

Year	Residential	Commercial	Industrial	Mining	Agricultural	Other	Electric Vehicles	Total Consumption
1980	0	0	0		3,354	0	0	3,354
1981	0	0	0		5,264	0	0	5,264
1982	0	0	0		5,192	0	0	5,192
1983	0	0	0		2,497	0	0	2,497
1984	0	0	0		3,349	0	0	3,349
1985	0	0	0		5,410	0	0	5,410
1986		0	0		5,031	0	0	5,031
1987	0	0	0		4,734	0	0	4,734
1988	0	0	0		5,928	0	0	5,928
1989	0	0	0		7,413	0	0	7,413
1990	0	0	0		8,171	0	0	8,171
1991	0	0	0		4,400	0	0	4,400
1992	0	0	0		4,088	0	0	4,088
1993	0	0	0		4,372	0	0	4,372
1994	0	0	0		4,946	0	0	4,946
1995	0	0	0		3,562	0	0	3,562
1996	0	0	0		5,146	0	0	5,146
1997	0	0	0		5,504	0	0	5,504
1998	0	0	0		3,421	0	0	3,421
1999	0	0	0		5,490	0	0	5,490
2000	0	0	0		5,490	0	0	5,490
2001	0	0	0		6,349	0	0	6,349
2002	0	0	0		7,889	0	0	7,889
2003	0	0	0		7,889	0	0	7,889
2004	0	0	0		7,889	0	0	7,889
2005	0	0	0		7,889	0	0	7,889
2006	0	0	0		7,889	0	0	7,889
2007	0	0	0		7,889	0	0	7,889
2008	0	0	0		7,889	0	0	7,889
2009	0	0	0		7,889	0	0	7,889
2010	0	0	0		7,889	0	0	7,889
2011	0	0	0		7,889	0	0	7,889
2012	0	0	0		7,889	0	0	7,889
2013	0	0	0		7,889	0	0	7,889

Annual Growth Rates (%)

	Agricultural	Total Consumption
1980-1990	9.3	9.3
1990-2000	-3.9	-3.9
2000-2003	12.8	12.8
2003-2008	0.0	0.0
2008-2013	0.0	0.0
2003-2013	0.0	0.0

Table A-9
Staff's Outlook for California
Electricity Consumption by Sector (GWh)

	Residential	Commercial	Industrial	Mining	Agricultural	Other	Electric Vehicles	Total Consumption
1980	52,082	47,922	39,177	5,212	13,301	9,282	0	166,976
1981	53,495	50,184	38,474	5,856	16,130	9,514	0	173,653
1982	52,574	50,011	36,285	6,177	14,369	10,067	0	169,483
1983	54,577	52,130	37,740	6,365	11,499	10,465	0	172,778
1984	57,564	55,483	39,323	7,077	15,122	10,993	0	185,561
1985	58,528	57,472	40,273	7,423	17,236	11,588	0	192,520
1986	58,452	60,111	41,105	6,565	15,738	11,182	0	193,153
1987	61,267	63,889	42,605	6,473	16,425	12,221	0	202,879
1988	64,033	66,745	44,973	6,561	18,096	12,628	0	213,036
1989	65,316	69,975	45,595	6,537	19,127	13,238	0	219,787
1990	67,667	73,482	45,869	6,595	20,849	13,577	0	228,038
1991	67,142	73,375	44,878	6,646	16,345	13,873	0	222,259
1992	69,225	76,693	44,928	6,447	15,483	14,210	0	226,987
1993	68,424	77,773	44,784	6,304	15,918	14,421	0	227,624
1994	69,774	77,609	44,476	6,146	16,957	15,136	0	230,098
1995	69,770	79,357	45,852	6,100	14,321	15,590	0	230,990
1996	72,164	81,737	46,855	6,821	16,898	15,162	0	239,636
1997	73,547	85,769	48,339	6,848	17,733	15,241	0	247,476
1998	75,387	84,798	48,571	6,457	14,624	14,666	0	244,503
1999	76,482	88,538	50,273	6,383	17,694	14,284	0	253,653
2000	80,612	92,384	51,783	6,493	17,652	14,674	0	263,599
2001	76,124	89,129	48,676	6,248	18,659	14,691	0	253,528
2002	77,337	90,650	44,788	5,997	20,570	14,314	10	253,667
2003	78,416	92,142	44,616	6,001	20,806	14,465	30	256,476
2004	79,815	95,334	45,006	5,997	21,333	14,707	60	262,252
2005	81,348	97,455	46,739	6,032	21,526	14,909	90	268,099
2006	82,951	99,326	47,967	6,059	21,725	15,176	125	273,329
2007	84,575	100,389	48,631	6,005	21,903	15,380	160	277,043
2008	86,644	102,012	49,212	6,021	22,077	15,606	200	281,773
2009	88,295	103,029	49,487	6,011	22,251	15,842	240	285,155
2010	90,040	104,191	49,888	5,957	22,432	16,124	300	288,931
2011	91,498	105,379	50,463	6,026	22,593	16,408	400	292,767
2012	93,024	106,842	50,808	5,965	22,761	16,682	500	296,582
2013	94,534	107,601	51,117	5,900	22,873	16,960	600	299,586
Annual Growth Rates (%)								
1980-1990	2.7	4.4	1.6	2.4	4.6	3.9		3.2
1990-2000	1.8	2.3	1.2	-0.2	-1.7	0.8		1.5
2000-2003	-0.9	-0.1	-4.8	-2.6	5.6	-0.5		-0.9
2003-2008	2.0	2.1	2.0	0.1	1.2	1.5	46.1	1.9
2008-2013	1.8	1.1	0.8	-0.4	0.7	1.7	24.6	1.2
2003-2013	1.9	1.6	1.4	-0.2	1.0	1.6	34.9	1.6

Table A-10
Staff's Outlook for California
Electricity Consumption by Utility (GWh)

	PG&E	SMUD	SCE	LADWP	SDG&E	BGP	OTH	DWR	TOTAL
1980	66,197	5,350	59,624	17,669	9,729	2,374	2,677	3,354	166,976
1981	67,653	5,693	61,594	18,340	9,875	2,452	2,781	5,264	173,653
1982	66,043	5,681	59,501	18,184	9,823	2,399	2,660	5,192	169,483
1983	68,497	5,954	62,006	18,722	10,073	2,433	2,595	2,497	172,778
1984	73,341	6,360	66,608	19,777	10,760	2,644	2,722	3,349	185,561
1985	75,617	6,881	68,203	19,760	11,180	2,699	2,770	5,410	192,520
1986	74,394	7,014	69,496	20,094	11,670	2,695	2,758	5,031	193,153
1987	78,962	7,419	72,999	20,772	12,367	2,754	2,872	4,734	202,879
1988	82,141	7,677	76,698	21,439	13,237	2,861	3,055	5,928	213,036
1989	84,529	7,927	78,417	21,555	13,929	2,813	3,205	7,413	219,787
1990	86,806	8,358	81,673	21,971	14,798	2,951	3,310	8,171	228,038
1991	86,929	8,349	80,223	21,635	14,641	2,759	3,323	4,400	222,259
1992	88,326	8,496	82,041	22,052	15,540	2,931	3,513	4,088	226,987
1993	89,239	8,435	81,133	22,396	15,451	2,996	3,602	4,372	227,624
1994	89,582	8,418	82,800	21,805	15,791	2,999	3,758	4,946	230,098
1995	90,763	8,458	82,855	22,526	15,923	3,084	3,819	3,562	230,990
1996	93,464	8,805	85,728	22,758	16,601	3,152	3,983	5,146	239,636
1997	97,078	9,006	88,382	23,166	17,132	3,236	3,972	5,504	247,476
1998	95,682	9,123	88,434	23,004	17,630	3,298	3,911	3,421	244,503
1999	99,205	9,326	91,013	23,058	18,312	3,240	4,009	5,490	253,653
2000	101,980	9,491	96,496	23,803	18,791	3,320	4,227	5,490	263,599
2001	98,748	9,334	90,506	23,265	17,822	3,275	4,230	6,349	253,528
2002	97,570	9,429	89,418	23,448	18,374	3,343	4,196	7,889	253,667
2003	98,597	9,563	90,419	23,703	18,663	3,380	4,262	7,889	256,476
2004	100,940	9,729	92,813	23,972	19,099	3,429	4,381	7,889	262,252
2005	103,115	9,906	95,406	24,306	19,541	3,471	4,466	7,889	268,099
2006	105,101	10,060	97,637	24,570	19,988	3,504	4,580	7,889	273,329
2007	106,599	10,214	99,100	24,739	20,347	3,516	4,639	7,889	277,043
2008	108,699	10,388	100,745	24,935	20,847	3,530	4,740	7,889	281,773
2009	110,053	10,548	102,038	25,062	21,194	3,542	4,828	7,889	285,155
2010	111,655	10,710	103,395	25,239	21,510	3,555	4,979	7,889	288,931
2011	113,087	10,869	104,956	25,448	21,847	3,570	5,100	7,889	292,767
2012	114,441	11,022	106,541	25,609	22,240	3,582	5,257	7,889	296,582
2013	115,507	11,172	107,654	25,839	22,518	3,592	5,415	7,889	299,586

Annual Growth Rates (%)

	PG&E	SMUD	SCE	LADWP	SDG&E	BGP	OTH	DWR	TOTAL
1980-1990	2.7	4.6	3.2	2.2	4.3	2.2	2.1	9.3	3.2
1990-2000	1.6	1.3	1.7	0.8	2.4	1.2	2.5	-3.9	1.5
2000-2003	-1.1	0.3	-2.1	-0.1	-0.2	0.6	0.3	12.8	-0.9
2003-2008	2.0	1.7	2.2	1.0	2.2	0.9	2.2	0.0	1.9
2008-2013	1.2	1.5	1.3	0.7	1.6	0.4	2.7	0.0	1.2
2003-2013	1.6	1.6	1.8	0.9	1.9	0.6	2.4	0.0	1.6

Table A-11
Staff's Outlook for California
Retail Sales by Utility (GWh)

	PG&E			SMUD	SCE			LADWP	SDG&E		BGP	OTH	DWR	TOTAL
Year	PG&E Customers	Municipal Sales in PG&E	Direct Access Sales in PG&E		SCE Customers	Municipal Sales in SCE	Direct Access Sales in SCE		SDG&E Customers	Direct Access Sales in SDG&E				
1990	69,445	13,369	0	8,358	70,464	7,901	0	20,953	14,331	0	2,951	3,310	8,171	219,254
1991	69,571	13,214	0	8,349	69,072	7,787	0	20,457	14,171	0	2,759	3,323	4,400	213,103
1992	70,671	13,467	0	8,496	71,087	7,545	0	20,945	15,093	0	2,931	3,513	4,088	217,837
1993	70,654	13,382	0	8,435	69,791	7,654	0	21,259	15,036	0	2,996	3,602	4,372	217,180
1994	70,733	13,350	0	8,418	71,117	7,952	0	20,308	15,381	0	2,999	3,758	4,946	218,962
1995	71,797	13,467	0	8,458	71,548	7,577	0	20,939	15,524	0	3,084	3,819	3,562	219,774
1996	73,273	13,746	0	8,805	73,766	8,029	0	21,228	16,046	0	3,152	3,983	5,146	227,174
1997	76,241	14,327	0	9,006	76,057	8,300	0	21,605	16,748	0	3,236	3,972	5,504	234,995
1998	70,121	14,364	5,559	9,123	70,097	8,189	6,161	21,412	13,609	3,641	3,298	3,911	3,421	232,905
1999	71,251	14,564	7,958	9,326	69,388	8,782	8,819	21,434	12,719	5,211	3,240	4,009	5,490	242,192
2000	73,387	15,039	8,396	9,491	74,130	9,108	9,304	22,146	12,926	5,498	3,320	4,227	5,490	252,464
2001	75,681	14,110	3,761	9,334	74,286	8,631	4,168	21,575	15,000	2,463	3,275	4,230	6,349	242,861
2002	69,950	13,925	8,321	9,429	65,450	8,537	11,088	21,724	14,394	3,423	3,343	4,196	7,889	241,668
2003	70,706	14,065	8,320	9,563	66,225	8,649	11,087	21,979	14,592	3,423	3,380	4,262	7,889	244,139
2004	72,496	14,455	8,427	9,729	68,146	8,896	11,267	22,248	14,947	3,498	3,429	4,381	7,889	249,809
2005	74,205	14,756	8,537	9,906	70,266	9,140	11,451	22,582	15,304	3,575	3,471	4,466	7,889	255,549
2006	75,748	15,033	8,647	10,060	72,054	9,352	11,638	22,846	15,666	3,654	3,504	4,580	7,889	260,671
2007	76,879	15,231	8,760	10,214	73,126	9,506	11,828	23,015	15,938	3,735	3,516	4,639	7,889	264,276
2008	78,530	15,509	8,873	10,388	74,365	9,673	12,021	23,211	16,348	3,818	3,530	4,740	7,889	268,895
2009	79,535	15,685	8,989	10,548	75,272	9,816	12,218	23,338	16,604	3,902	3,542	4,828	7,889	272,165
2010	80,751	15,895	9,106	10,710	76,234	9,963	12,417	23,515	16,826	3,989	3,555	4,979	7,889	275,829
2011	81,814	16,086	9,225	10,869	77,383	10,124	12,621	23,724	17,068	4,078	3,570	5,100	7,889	279,551
2012	82,812	16,262	9,345	11,022	78,550	10,287	12,827	23,885	17,363	4,168	3,582	5,257	7,889	283,252
2013	83,569	16,389	9,468	11,172	79,289	10,402	13,038	24,115	17,541	4,261	3,592	5,415	7,889	286,139
Annual Growth Rates (%)														
1980-1990	2.4	2.3		4.6	2.8	3.0		1.7	3.9		2.2	2.1	9.3	2.8
1990-2000	0.6	1.2		1.3	0.5	1.4		0.6	-1.0		1.2	2.5	-3.9	1.4
2000-2003	-1.2	-2.2	-0.3	0.3	-3.7	-1.7	6.0	-0.3	4.1	-14.6	0.6	0.3	12.8	-1.1
2003-2008	2.1	2.0	1.3	1.7	2.3	2.3	1.6	1.1	2.3	2.2	0.9	2.2	0.0	2.0
2008-2013	1.3	1.1	1.3	1.5	1.3	1.5	1.6	0.8	1.4	2.2	0.4	2.7	0.0	1.3
2003-2013	1.7	1.5	1.3	1.6	1.8	1.9	1.6	0.9	1.9	2.2	0.6	2.4	0.0	1.6

Historic data through 2001

Retail Sales = Consumption minus private supply

Table B-1
Staff's Outlook for the PG&E Area
Net Energy for Load (GWh)

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	66,197	6,294	72,492	631	71,861
1981	67,653	6,433	74,087	638	73,449
1982	66,043	6,270	72,313	728	71,585
1983	68,497	6,485	74,982	948	74,034
1984	73,341	6,957	80,298	874	79,424
1985	75,617	7,161	82,778	1,024	81,754
1986	74,394	6,980	81,374	1,686	79,688
1987	78,962	7,317	86,279	2,742	83,537
1988	82,141	7,559	89,700	3,402	86,298
1989	84,529	7,746	92,275	3,843	88,432
1990	86,806	7,950	94,757	3,992	90,764
1991	86,929	7,947	94,877	4,145	90,732
1992	88,326	8,077	96,403	4,188	92,215
1993	89,239	8,067	97,307	5,203	92,104
1994	89,582	8,072	97,654	5,498	92,156
1995	90,763	8,185	98,948	5,498	93,450
1996	93,464	8,354	101,817	6,445	95,373
1997	97,078	8,695	105,772	6,510	99,262
1998	95,682	8,644	104,327	5,639	98,688
1999	99,205	9,002	108,207	5,433	102,775
2000	101,980	9,295	111,275	5,158	106,117
2001	98,748	8,981	107,728	5,196	102,532
2002	97,570	8,851	106,421	5,375	101,046
2003	98,597	8,937	107,534	5,506	102,027
2004	100,940	9,156	110,096	5,561	104,535
2005	103,115	9,360	112,474	5,617	106,858
2006	105,101	9,545	114,646	5,673	108,973
2007	106,599	9,683	116,283	5,730	110,553
2008	108,699	9,880	118,579	5,787	112,792
2009	110,053	10,004	120,057	5,845	114,212
2010	111,655	10,152	121,807	5,903	115,904
2011	113,087	10,284	123,371	5,962	117,409
2012	114,441	10,408	124,850	6,022	118,828
2013	115,507	10,505	126,012	6,082	119,930
Annual Growth Rates (%)					
1980-1990	2.7	2.4	2.7	20.3	2.4
1990-2000	1.6	1.6	1.6	2.6	1.6
2000-2003	-1.1	-1.3	-1.1	2.2	-1.3
2003-2008	2.0	2.0	2.0	1.0	2.0
2008-2013	1.2	1.2	1.2	1.0	1.2
2003-2013	1.6	1.6	1.6	1.0	1.6

Table B-2
Staff's Outlook for the SMUD Area
Net Energy for Load (GWh)

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	5,350	342	5,693	0	5,693
1981	5,693	364	6,057	0	6,057
1982	5,681	364	6,044	0	6,044
1983	5,954	381	6,335	0	6,335
1984	6,360	407	6,767	0	6,767
1985	6,881	440	7,322	0	7,322
1986	7,014	449	7,463	0	7,463
1987	7,419	475	7,894	0	7,894
1988	7,677	491	8,168	0	8,168
1989	7,927	507	8,434	0	8,434
1990	8,358	535	8,893	0	8,893
1991	8,349	534	8,884	0	8,884
1992	8,496	544	9,040	0	9,040
1993	8,435	540	8,974	0	8,974
1994	8,418	539	8,957	0	8,957
1995	8,458	541	8,999	0	8,999
1996	8,805	564	9,369	0	9,369
1997	9,006	576	9,583	0	9,583
1998	9,123	584	9,707	0	9,707
1999	9,326	597	9,923	0	9,923
2000	9,491	607	10,098	0	10,098
2001	9,334	597	9,931	0	9,931
2002	9,429	603	10,033	0	10,033
2003	9,563	612	10,175	0	10,175
2004	9,729	623	10,351	0	10,351
2005	9,906	634	10,540	0	10,540
2006	10,060	644	10,704	0	10,704
2007	10,214	654	10,868	0	10,868
2008	10,388	665	11,053	0	11,053
2009	10,548	675	11,223	0	11,223
2010	10,710	685	11,395	0	11,395
2011	10,869	696	11,565	0	11,565
2012	11,022	705	11,727	0	11,727
2013	11,172	715	11,886	0	11,886
Annual Growth Rates (%)					
1980-1990	4.6	4.6	4.6		4.6
1990-2000	1.3	1.3	1.3		1.3
2000-2003	0.3	0.3	0.3		0.3
2003-2008	1.7	1.7	1.7		1.7
2008-2013	1.5	1.5	1.5		1.5
2003-2013	1.6	1.6	1.6		1.6

Table B-3
Staff's Outlook for the SCE Area
Net Energy for Load (GWh)

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	59,624	4,035	63,659	289	63,370
1981	61,594	4,168	65,763	296	65,467
1982	59,501	4,013	63,514	492	63,022
1983	62,006	4,154	66,161	914	65,247
1984	66,608	4,454	71,063	1,103	69,960
1985	68,203	4,550	72,753	1,286	71,467
1986	69,496	4,629	74,124	1,428	72,696
1987	72,999	4,842	77,841	1,790	76,051
1988	76,698	5,010	81,709	3,019	78,690
1989	78,417	5,115	83,532	3,199	80,333
1990	81,673	5,329	87,002	3,308	83,694
1991	80,223	5,226	85,449	3,363	82,086
1992	82,041	5,347	87,388	3,408	83,979
1993	81,133	5,266	86,399	3,689	82,711
1994	82,800	5,377	88,176	3,730	84,446
1995	82,855	5,380	88,235	3,730	84,505
1996	85,728	5,562	91,290	3,933	87,357
1997	88,382	5,736	94,119	4,026	90,092
1998	88,434	5,742	94,177	3,987	90,190
1999	91,013	5,915	96,928	4,023	92,904
2000	96,496	6,293	102,789	3,954	98,835
2001	90,506	5,922	96,428	3,422	93,006
2002	89,418	5,785	95,203	4,344	90,859
2003	90,419	5,845	96,264	4,459	91,805
2004	92,813	6,005	98,818	4,503	94,315
2005	95,406	6,178	101,584	4,548	97,036
2006	97,637	6,327	103,964	4,594	99,371
2007	99,100	6,423	105,523	4,640	100,883
2008	100,745	6,532	107,277	4,686	102,591
2009	102,038	6,617	108,655	4,733	103,922
2010	103,395	6,706	110,101	4,780	105,320
2011	104,956	6,809	111,764	4,828	106,936
2012	106,541	6,913	113,454	4,876	108,578
2013	107,654	6,986	114,639	4,925	109,714
Annual Growth Rates (%)					
1980-1990	3.2	2.8	3.2	27.6	2.8
1990-2000	1.7	1.7	1.7	1.8	1.7
2000-2003	-2.1	-2.4	-2.2	4.1	-2.4
2003-2008	2.2	2.2	2.2	1.0	2.2
2008-2013	1.3	1.4	1.3	1.0	1.4
2003-2013	1.8	1.8	1.8	1.0	1.8

Table B-4
Staff's Outlook for the LADWP Area
Net Energy for Load (GWh)

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	17,669	2,385	20,055	0	20,055
1981	18,340	2,476	20,816	0	20,816
1982	18,184	2,455	20,639	0	20,639
1983	18,722	2,496	21,219	230	20,989
1984	19,777	2,624	22,401	339	22,062
1985	19,760	2,625	22,385	317	22,068
1986	20,094	2,656	22,749	423	22,326
1987	20,772	2,738	23,510	488	23,022
1988	21,439	2,797	24,236	720	23,516
1989	21,555	2,787	24,341	913	23,428
1990	21,971	2,829	24,800	1,018	23,782
1991	21,635	2,762	24,396	1,178	23,218
1992	22,052	2,828	24,880	1,107	23,773
1993	22,396	2,870	25,266	1,137	24,129
1994	21,805	2,742	24,547	1,497	23,050
1995	22,526	2,827	25,352	1,587	23,765
1996	22,758	2,866	25,623	1,530	24,093
1997	23,166	2,917	26,083	1,561	24,522
1998	23,004	2,891	25,894	1,592	24,302
1999	23,058	2,894	25,952	1,624	24,328
2000	23,803	2,990	26,793	1,657	25,136
2001	23,265	2,913	26,177	1,690	24,487
2002	23,448	2,933	26,380	1,724	24,656
2003	23,703	2,967	26,670	1,724	24,946
2004	23,972	3,004	26,976	1,724	25,252
2005	24,306	3,049	27,354	1,724	25,630
2006	24,570	3,084	27,654	1,724	25,930
2007	24,739	3,107	27,846	1,724	26,122
2008	24,935	3,133	28,069	1,724	26,345
2009	25,062	3,151	28,213	1,724	26,489
2010	25,239	3,174	28,413	1,724	26,689
2011	25,448	3,203	28,651	1,724	26,927
2012	25,609	3,224	28,834	1,724	27,110
2013	25,839	3,255	29,094	1,724	27,370
Annual Growth Rates (%)					
1980-1990	2.2	1.7	2.1		1.7
1990-2000	0.8	0.6	0.8	5.0	0.6
2000-2003	-0.1	-0.3	-0.2	1.3	-0.3
2003-2008	1.0	1.1	1.0	0.0	1.1
2008-2013	0.7	0.8	0.7	0.0	0.8
2003-2013	0.9	0.9	0.9	0.0	0.9

Table B-5
Staff's Outlook for the SDG&E Area
Net Energy for Load (GWh)

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	9,729	690	10,419	0	10,419
1981	9,875	700	10,575	0	10,575
1982	9,823	696	10,519	11	10,508
1983	10,073	711	10,784	50	10,734
1984	10,760	753	11,512	144	11,368
1985	11,180	775	11,955	250	11,705
1986	11,670	806	12,476	307	12,169
1987	12,367	845	13,212	447	12,765
1988	13,237	901	14,139	524	13,615
1989	13,929	952	14,881	502	14,379
1990	14,798	1,016	15,814	466	15,348
1991	14,641	1,005	15,646	470	15,176
1992	15,540	1,070	16,610	446	16,164
1993	15,451	1,066	16,517	415	16,102
1994	15,791	1,091	16,881	410	16,472
1995	15,923	1,101	17,024	400	16,624
1996	16,601	1,138	17,738	555	17,184
1997	17,132	1,187	18,319	384	17,935
1998	17,630	1,223	18,853	381	18,472
1999	18,312	1,271	19,583	381	19,202
2000	18,791	1,306	20,097	367	19,731
2001	17,822	1,238	19,060	358	18,701
2002	18,374	1,263	19,637	557	19,080
2003	18,663	1,277	19,940	648	19,292
2004	19,099	1,308	20,407	654	19,753
2005	19,541	1,339	20,879	661	20,218
2006	19,988	1,370	21,358	668	20,690
2007	20,347	1,395	21,742	674	21,068
2008	20,847	1,430	22,276	681	21,595
2009	21,194	1,454	22,647	688	21,960
2010	21,510	1,476	22,985	695	22,291
2011	21,847	1,499	23,346	702	22,645
2012	22,240	1,527	23,767	709	23,058
2013	22,518	1,546	24,064	716	23,349

Annual Growth Rates (%)

1980-1990	4.3	3.9	4.3		3.9
1990-2000	2.4	2.5	2.4	-2.4	2.5
2000-2003	-0.2	-0.7	-0.3	20.9	-0.7
2003-2008	2.2	2.3	2.2	1.0	2.3
2008-2013	1.6	1.6	1.6	1.0	1.6
2003-2013	1.9	1.9	1.9	1.0	1.9

Table B-6
Staff's Outlook for the BGP Area
Net Energy for Load (GWh)

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	2,374	152	2,526	0	2,526
1981	2,452	157	2,609	0	2,609
1982	2,399	154	2,552	0	2,552
1983	2,433	156	2,588	0	2,588
1984	2,644	169	2,813	0	2,813
1985	2,699	173	2,872	0	2,872
1986	2,695	172	2,868	0	2,868
1987	2,754	176	2,930	0	2,930
1988	2,861	183	3,044	0	3,044
1989	2,813	180	2,993	0	2,993
1990	2,951	189	3,140	0	3,140
1991	2,759	177	2,936	0	2,936
1992	2,931	188	3,118	0	3,118
1993	2,996	192	3,188	0	3,188
1994	2,999	192	3,190	0	3,190
1995	3,084	197	3,282	0	3,282
1996	3,152	202	3,353	0	3,353
1997	3,236	207	3,443	0	3,443
1998	3,298	211	3,509	0	3,509
1999	3,240	207	3,447	0	3,447
2000	3,320	212	3,533	0	3,533
2001	3,275	210	3,485	0	3,485
2002	3,343	214	3,557	0	3,557
2003	3,380	216	3,597	0	3,597
2004	3,429	219	3,648	0	3,648
2005	3,471	222	3,693	0	3,693
2006	3,504	224	3,728	0	3,728
2007	3,516	225	3,741	0	3,741
2008	3,530	226	3,755	0	3,755
2009	3,542	227	3,769	0	3,769
2010	3,555	227	3,782	0	3,782
2011	3,570	228	3,799	0	3,799
2012	3,582	229	3,811	0	3,811
2013	3,592	230	3,822	0	3,822
Annual Growth Rates (%)					
1980-1990	2.2	2.2	2.2		2.2
1990-2000	1.2	1.2	1.2		1.2
2000-2003	0.6	0.6	0.6		0.6
2003-2008	0.9	0.9	0.9		0.9
2008-2013	0.4	0.4	0.4		0.4
2003-2013	0.6	0.6	0.6		0.6

Table B-7
Staff's Outlook for the Other Area
Net Energy for Load (GWh)

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	2,677	343	3,020	0	3,020
1981	2,781	356	3,137	0	3,137
1982	2,660	341	3,001	0	3,001
1983	2,595	332	2,928	0	2,928
1984	2,722	348	3,071	0	3,071
1985	2,770	355	3,124	0	3,124
1986	2,758	353	3,111	0	3,111
1987	2,872	368	3,240	0	3,240
1988	3,055	391	3,446	0	3,446
1989	3,205	410	3,615	0	3,615
1990	3,310	424	3,733	0	3,733
1991	3,323	425	3,748	0	3,748
1992	3,513	450	3,963	0	3,963
1993	3,602	461	4,063	0	4,063
1994	3,758	481	4,239	0	4,239
1995	3,819	489	4,308	0	4,308
1996	3,983	510	4,493	0	4,493
1997	3,972	508	4,481	0	4,481
1998	3,911	501	4,412	0	4,412
1999	4,009	513	4,522	0	4,522
2000	4,227	541	4,768	0	4,768
2001	4,230	541	4,771	0	4,771
2002	4,196	537	4,734	0	4,734
2003	4,262	546	4,807	0	4,807
2004	4,381	561	4,942	0	4,942
2005	4,466	572	5,038	0	5,038
2006	4,580	586	5,167	0	5,167
2007	4,639	594	5,233	0	5,233
2008	4,740	607	5,347	0	5,347
2009	4,828	618	5,445	0	5,445
2010	4,979	637	5,617	0	5,617
2011	5,100	653	5,753	0	5,753
2012	5,257	673	5,930	0	5,930
2013	5,415	693	6,108	0	6,108

Annual Growth Rates (%)					
1980-1990	2.1	2.1	2.1		2.1
1990-2000	2.5	2.5	2.5		2.5
2000-2003	0.3	0.3	0.3		0.3
2003-2008	2.2	2.2	2.2		2.2
2008-2013	2.7	2.7	2.7		2.7
2003-2013	2.4	2.4	2.4		2.4

Table B-8
Staff's Outlook for the DWR Area
Net Energy for Load (GWh)

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	3,354	127	3,481	0	3,481
1981	5,264	200	5,464	0	5,464
1982	5,192	197	5,389	0	5,389
1983	2,497	95	2,592	0	2,592
1984	3,349	127	3,476	0	3,476
1985	5,410	206	5,616	0	5,616
1986	5,031	191	5,222	0	5,222
1987	4,734	180	4,913	0	4,913
1988	5,928	225	6,154	0	6,154
1989	7,413	282	7,694	0	7,694
1990	8,171	311	8,482	0	8,482
1991	4,400	167	4,567	0	4,567
1992	4,088	155	4,243	0	4,243
1993	4,372	166	4,538	0	4,538
1994	4,946	188	5,133	0	5,133
1995	3,562	135	3,698	0	3,698
1996	5,146	196	5,342	0	5,342
1997	5,504	209	5,713	0	5,713
1998	3,421	130	3,551	0	3,551
1999	5,490	209	5,699	0	5,699
2000	5,490	209	5,699	0	5,699
2001	6,349	269	6,619	0	6,619
2002	7,889	335	8,224	0	8,224
2003	7,889	335	8,224	0	8,224
2004	7,889	335	8,224	0	8,224
2005	7,889	335	8,224	0	8,224
2006	7,889	335	8,224	0	8,224
2007	7,889	335	8,224	0	8,224
2008	7,889	335	8,224	0	8,224
2009	7,889	335	8,224	0	8,224
2010	7,889	335	8,224	0	8,224
2011	7,889	335	8,224	0	8,224
2012	7,889	335	8,224	0	8,224
2013	7,889	335	8,224	0	8,224
Annual Growth Rates (%)					
1980-1990	9.3	9.3	9.3		9.3
1990-2000	-3.9	-3.9	-3.9		-3.9
2000-2003	12.8	17.1	13.0		13.0
2003-2008	0.0	0.0	0.0		0.0
2008-2013	0.0	0.0	0.0		0.0
2003-2013	0.0	0.0	0.0		0.0

TABLE B-9
Staff's Outlook for the State
Net Energy for Load (GWh)

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	166,976	14,369	181,345	920	180,425
1981	173,653	14,855	188,508	934	187,574
1982	169,483	14,488	183,971	1,231	182,740
1983	172,778	14,810	187,588	2,142	185,446
1984	185,561	15,840	201,401	2,460	198,941
1985	192,520	16,284	208,805	2,877	205,928
1986	193,153	16,235	209,388	3,844	205,544
1987	202,879	16,941	219,821	5,467	214,354
1988	213,036	17,558	230,595	7,665	222,930
1989	219,787	17,979	237,766	8,457	229,309
1990	228,038	18,582	246,620	8,784	237,836
1991	222,259	18,244	240,503	9,156	231,347
1992	226,987	18,658	245,645	9,149	236,495
1993	227,624	18,628	246,252	10,444	235,809
1994	230,098	18,680	248,778	11,136	237,642
1995	230,990	18,856	249,846	11,216	238,631
1996	239,636	19,390	259,026	12,462	246,564
1997	247,476	20,036	267,512	12,481	255,031
1998	244,503	19,926	264,429	11,598	252,830
1999	253,653	20,608	274,262	11,461	262,800
2000	263,599	21,453	285,052	11,135	273,917
2001	253,528	20,671	274,199	10,667	263,533
2002	253,667	20,521	274,188	12,000	262,189
2003	256,476	20,735	277,211	12,337	264,874
2004	262,252	21,210	283,462	12,443	271,019
2005	268,099	21,688	289,787	12,550	277,237
2006	273,329	22,115	295,444	12,658	282,786
2007	277,043	22,416	299,459	12,768	286,692
2008	281,773	22,807	304,580	12,878	291,702
2009	285,155	23,080	308,234	12,990	295,245
2010	288,931	23,393	312,325	13,102	299,222
2011	292,767	23,706	316,473	13,216	303,257
2012	296,582	24,015	320,597	13,331	307,266
2013	299,586	24,264	323,850	13,447	310,403

Annual Growth Rates (%)

1980-1990	3.2	2.6	3.1	25.3	2.8
1990-2000	1.5	1.4	1.5	2.4	1.4
2000-2003	-0.9	-1.1	-0.9	3.5	-1.1
2003-2008	1.9	1.9	1.9	0.9	1.9
2008-2013	1.2	1.2	1.2	0.9	1.3
2003-2013	1.6	1.6	1.6	0.9	1.6

Table B-10
Staff's Outlook for the State
1 IN 2 Net Energy for Load by CAISO Congestion Zone with Municipal Sales and Direct Access
(GWh)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Growth Rate (%) 2001-2006	Growth Rate (%) 2001-2013
PG&E North	87,761	87,409	88,125	90,125	92,104	93,966	95,328	97,257	98,482	99,940	101,243	102,468	103,422	1.38	1.38
PG&E Direct Access	4,122	9,119	9,119	9,236	9,356	9,477	9,600	9,725	9,852	9,980	10,110	10,242	10,376	18.12	8.00
PG&E Sales	68,175	63,028	63,592	65,046	66,576	68,013	69,034	70,535	71,440	72,539	73,502	74,402	75,084	-0.05	0.81
Muni Sales	15,464	15,262	15,415	15,843	16,172	16,476	16,693	16,997	17,190	17,421	17,630	17,823	17,962	1.28	1.26
PG&E San Francisco	5,828	5,266	5,455	5,761	5,906	5,973	6,059	6,176	6,254	6,346	6,422	6,499	6,559	0.49	0.99
Dept of Water Resources - North	1,048	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	4.44	1.83
North of Path 15	94,637	93,977	94,882	97,188	99,312	101,241	102,689	104,735	106,038	107,587	108,967	110,269	111,283	1.36	1.36
Path 26 Pacific Gas & Electric - South	8,943	8,371	8,448	8,649	8,848	9,034	9,166	9,359	9,476	9,619	9,744	9,861	9,949	0.20	0.89
Path 26 - Dept of Water Resources	1,731	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	4.44	1.83
Total Path 26	10,674	10,522	10,599	10,800	10,999	11,185	11,317	11,510	11,628	11,770	11,895	12,012	12,100	0.94	1.05
Southern California Edison	93,006	90,859	91,805	94,315	97,036	99,371	100,883	102,591	103,922	105,320	106,936	108,578	109,714	1.33	1.39
SCE Sales	79,337	69,900	70,728	72,780	75,044	76,953	78,098	79,421	80,390	81,418	82,645	83,891	84,681	-0.61	0.54
Muni Sales	9,217	9,118	9,237	9,501	9,762	9,988	10,153	10,331	10,483	10,641	10,813	10,987	11,109	1.62	1.57
SCE Direct Access	4,451	11,842	11,841	12,033	12,230	12,429	12,632	12,839	13,048	13,262	13,479	13,700	13,924	22.80	9.97
Pasadena Water and Power Dept	1,193	1,217	1,231	1,249	1,264	1,276	1,280	1,285	1,290	1,295	1,300	1,305	1,308	1.36	0.77
San Diego Gas & Electric	18,701	19,080	19,292	19,753	20,218	20,690	21,068	21,595	21,960	22,291	22,645	23,058	23,349	2.04	1.87
SDG&E Sales	16,064	15,414	15,626	16,006	16,389	16,777	17,068	17,507	17,781	18,019	18,278	18,594	18,785	0.87	1.31
SDG&E Direct Access	2,638	3,666	3,666	3,746	3,829	3,913	4,000	4,088	4,179	4,272	4,367	4,464	4,564	8.21	4.67
Dept of Water Resources - South	3,839	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4.44	1.83
South of Path 15	116,739	115,928	117,099	120,087	123,289	126,108	128,002	130,242	131,943	133,676	135,652	137,712	139,141	1.56	1.47
Sacramento Municipal Utilities District	9,931	10,033	10,175	10,351	10,540	10,704	10,868	11,053	11,223	11,395	11,565	11,727	11,886	1.51	1.51
Los Angeles Department of Water and Power	24,487	24,656	24,946	25,252	25,630	25,930	26,122	26,345	26,489	26,689	26,927	27,110	27,370	1.15	0.93
Burbank Public Service Dept	1,117	1,140	1,153	1,170	1,184	1,195	1,199	1,204	1,209	1,213	1,218	1,222	1,225	1.36	0.77
Glendale Public Service Dept	1,175	1,199	1,212	1,230	1,245	1,257	1,261	1,266	1,270	1,275	1,280	1,285	1,288	1.36	0.77
Imperial Irrigation District	3,078	3,185	3,272	3,360	3,449	3,539	3,629	3,716	3,801	3,889	3,976	4,062	4,148	2.83	2.52
Far North & East Sierra	1,693	1,549	1,535	1,582	1,589	1,628	1,604	1,631	1,644	1,728	1,777	1,868	1,960	-0.79	1.23
Non ISO	41,482	41,762	42,294	42,944	43,637	44,253	44,683	45,214	45,637	46,189	46,743	47,274	47,879	1.30	1.20
Total CAISO	231,982	220,427	222,580	228,075	233,599	238,533	242,008	246,487	249,608	253,034	256,514	259,993	262,524	0.56	1.04
Total State	263,533	262,189	264,874	271,019	277,237	282,786	286,692	291,702	295,245	299,222	303,257	307,266	310,403	1.42	1.37

Historic data through 2002

SMUD is included in ISO total through 2001.

Table B-11
Staff's High Demand Scenario for the State
1 IN 2 Net Energy for Load by CAISO Congestion Zone with Municipal Sales and Direct Access
(GWh)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Growth Rate (%) 2001-2006	Growth Rate (%) 2001-2013
PG&E North Total	87,761	87,409	88,125	91,129	93,864	96,606	98,672	100,334	101,374	102,760	103,958	105,196	106,220	1.94	1.60
PG&E Direct Access	4,122	9,119	9,119	9,236	9,356	9,477	9,600	9,725	9,852	9,980	10,110	10,242	10,376	18.12	8.00
PG&E Sales	68,175	63,028	63,592	65,892	68,056	70,223	71,827	73,092	73,846	74,884	75,764	76,675	77,416	0.59	1.06
Muni Sales	15,464	15,262	15,415	16,001	16,452	16,906	17,244	17,516	17,676	17,896	18,084	18,278	18,428	1.80	1.47
PG&E San Francisco	5,828	5,266	5,455	5,804	5,965	6,092	6,220	6,316	6,383	6,469	6,539	6,616	6,680	0.89	1.14
Dept of Water Resources - North	1,048	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	4.44	1.83
North of Path 15	94,637	93,977	94,882	98,236	101,131	104,000	106,193	107,951	109,059	110,531	111,799	113,114	114,203	1.90	1.58
Path 26 Pacific Gas & Electric - South	8,943	8,371	8,448	8,756	9,036	9,316	9,524	9,688	9,786	9,920	10,034	10,153	10,248	0.82	1.14
Path 26 - Dept of Water Resources	1,731	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	4.44	1.83
Total Path 26	10,674	10,522	10,599	10,907	11,187	11,467	11,675	11,839	11,937	12,072	12,186	12,304	12,399	1.44	1.26
Southern California Edison	93,006	90,859	91,805	95,276	98,683	101,791	104,103	105,659	106,865	108,147	109,590	111,264	112,465	1.82	1.60
SCE Sales	79,337	69,900	70,728	73,667	76,565	79,185	81,066	82,247	83,102	84,021	85,089	86,365	87,215	-0.04	0.79
Muni Sales	9,217	9,118	9,237	9,575	9,888	10,177	10,405	10,574	10,715	10,864	11,022	11,199	11,326	2.00	1.73
SCE Direct Access	4,451	11,842	11,841	12,033	12,230	12,429	12,632	12,839	13,048	13,262	13,479	13,700	13,924	22.80	9.97
Pasadena Water and Power Dept	1,193	1,217	1,231	1,257	1,280	1,299	1,312	1,317	1,321	1,325	1,329	1,333	1,337	1.73	0.96
San Diego Gas & Electric	18,701	19,080	19,292	19,928	20,545	21,156	21,684	22,177	22,533	22,847	23,185	23,604	23,905	2.50	2.07
SDG&E Sales	16,064	15,414	15,626	16,182	16,716	17,242	17,685	18,089	18,354	18,575	18,819	19,140	19,342	1.43	1.56
SDG&E Direct Access	2,638	3,666	3,666	3,746	3,829	3,913	4,000	4,088	4,179	4,272	4,367	4,464	4,564	8.21	4.67
Dept of Water Resources - South	3,839	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4.44	1.83
South of Path 15	116,739	115,928	117,099	121,232	125,279	129,017	131,870	133,923	135,490	137,089	138,875	140,972	142,478	2.02	1.67
Sacramento Municipal Utilities District	9,931	10,033	10,175	10,432	10,683	10,909	11,128	11,297	11,466	11,632	11,799	11,966	12,132	1.90	1.68
Los Angeles Department of Water and Power	24,487	24,656	24,946	25,458	26,000	26,462	26,817	27,018	27,158	27,331	27,533	27,715	27,984	1.56	1.12
Burbank Public Service Dept	1,117	1,140	1,153	1,178	1,199	1,217	1,229	1,233	1,238	1,241	1,245	1,249	1,253	1.73	0.96
Glendale Public Service Dept	1,175	1,199	1,212	1,238	1,261	1,280	1,292	1,297	1,301	1,304	1,309	1,313	1,317	1.73	0.96
Imperial Irrigation District	3,078	3,185	3,272	3,360	3,449	3,539	3,629	3,716	3,801	3,889	3,976	4,062	4,148	2.83	2.52
Far North & East Sierra	1,693	1,549	1,535	1,618	1,664	1,707	1,745	1,757	1,759	1,801	1,850	1,942	2,035	0.16	1.55
Non CAISO	41,482	41,762	42,294	43,283	44,256	45,114	45,841	46,318	46,722	47,199	47,711	48,246	48,868	1.69	1.37
Total CAISO	231,982	230,459	232,755	240,807	248,280	255,393	260,866	265,011	267,951	271,324	274,658	278,356	281,211	1.94	1.62
Total State	263,533	262,189	264,874	273,658	281,853	289,598	295,579	300,032	303,207	306,890	310,571	314,636	317,948	1.90	1.58

TABLE B-12
Staff's Low Demand Scenario for the State
1 IN 2 Net Energy for Load by CAISO Congestion Zone with Municipal Sales and Direct Access
(GWh)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Growth Rate (%) 2001-2006	Growth Rate (%) 2003-2013
PG&E North Total	87,761	87,409	88,125	89,628	90,937	92,212	92,846	94,307	95,443	97,032	98,439	99,659	100,756	0.99	1.35
PG&E Direct Access	4,122	9,119	9,119	9,236	9,356	9,477	9,600	9,725	9,852	9,980	10,110	10,242	10,376	18.12	1.30
PG&E Sales	68,175	63,028	63,592	64,635	65,608	66,552	66,957	68,052	68,882	70,087	71,141	72,036	72,832	-0.48	1.37
Muni Sales	15,464	15,262	15,415	15,757	15,974	16,183	16,289	16,529	16,710	16,965	17,188	17,381	17,547	0.91	1.30
PG&E San Francisco	5,828	5,266	5,455	5,731	5,835	5,867	5,949	6,012	6,074	6,166	6,240	6,316	6,389	0.13	1.59
Dept of Water Resources - North	1,048	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	4.44	0.00
North of Path 15	94,637	93,977	94,882	96,661	98,074	99,381	100,097	101,621	102,819	104,499	105,981	107,278	108,447	0.98	1.35
Path 26 Pacific Gas & Electric - South	8,943	8,371	8,448	8,596	8,723	8,846	8,901	9,044	9,152	9,308	9,444	9,561	9,664	-0.22	1.35
Path 26 - Dept of Water Resources	1,731	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	4.44	0.00
Total Path 26	10,674	10,522	10,599	10,747	10,874	10,998	11,052	11,195	11,303	11,459	11,596	11,712	11,815	0.60	1.09
Southern California Edison	93,006	90,859	91,805	93,695	95,593	97,109	97,898	99,422	100,789	102,198	103,767	105,443	106,788	0.87	1.52
SCE Sales	79,337	69,900	70,728	72,210	73,717	74,869	75,346	76,494	77,494	78,528	79,712	80,989	81,971	-1.15	1.49
Muni Sales	9,217	9,118	9,237	9,452	9,646	9,810	9,919	10,089	10,247	10,408	10,577	10,754	10,892	1.25	1.66
SCE Direct Access	4,451	11,842	11,841	12,033	12,230	12,429	12,632	12,839	13,048	13,262	13,479	13,700	13,924	22.80	1.63
Pasadena Water and Power Dept	1,193	1,217	1,231	1,242	1,249	1,252	1,249	1,255	1,260	1,264	1,270	1,275	1,280	0.98	0.39
San Diego Gas & Electric	18,701	19,080	19,292	19,610	19,947	20,260	20,492	20,942	21,276	21,589	21,932	22,335	22,639	1.61	1.61
SDG&E Sales	16,064	15,414	15,626	15,863	16,118	16,347	16,493	16,853	17,097	17,318	17,565	17,871	18,075	0.35	1.47
SDG&E Direct Access	2,638	3,666	3,666	3,746	3,829	3,913	4,000	4,088	4,179	4,272	4,367	4,464	4,564	8.21	2.21
Dept of Water Resources - South	3,839	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4.44	0.00
South of Path 15	116,739	115,928	117,099	119,317	121,560	123,392	124,410	126,389	128,096	129,823	131,739	133,823	135,478	1.11	1.47
Sacramento Municipal Utilities District	9,931	10,033	10,175	10,319	10,456	10,562	10,661	10,812	10,980	11,149	11,317	11,478	11,641	1.24	1.35
Los Angeles Department of Water and Power	24,487	24,656	24,946	25,106	25,314	25,422	25,449	25,640	25,810	26,000	26,227	26,438	26,758	0.75	0.70
Burbank Public Service Dept	1,117	1,140	1,153	1,163	1,170	1,173	1,171	1,175	1,180	1,184	1,189	1,194	1,200	0.98	0.39
Glendale Public Service Dept	1,175	1,199	1,212	1,223	1,230	1,233	1,230	1,235	1,241	1,245	1,250	1,256	1,261	0.98	0.39
Imperial Irrigation District	3,078	3,185	3,272	3,360	3,449	3,539	3,629	3,716	3,801	3,889	3,976	4,062	4,148	2.83	2.40
Far North & East Sierra	1,693	1,549	1,535	1,555	1,546	1,527	1,504	1,521	1,504	1,512	1,522	1,528	1,530	-2.04	-0.03
Non CAISO	41,482	41,762	42,294	42,726	43,165	43,457	43,644	44,099	44,515	44,979	45,483	45,956	46,538	0.93	0.96
Total CAISO	231,982	220,427	222,580	226,726	230,508	233,770	235,559	239,205	242,218	245,781	249,316	252,813	255,739	0.15	1.40
Total State	263,533	262,189	264,874	269,452	273,673	277,227	279,204	283,304	286,733	290,760	294,799	298,769	302,277	1.02	1.33

Table C-1
Staff's Outlook for the PG&E Area
End Use Peak Demand by Sector (MW)

Year	Residential			Commercial			Industrial				Agr.	TCU & Street-lighting	Electric Vehicles	Total End-use Load		
	Base Load	Weather Sensitive	Total	Base Load	Weather Sensitive	Total	Process	Assembly	Mining	Total Industrial				Base Load	Weather Sensitive	Total
1990	3647	2767	6414	3266	1525	4791	1555	1254	394	3202	1306	489	0	11911	4292	16203
1991	3685	2936	6620	3210	1339	4549	1222	1203	410	2835	1029	492	0	11251	4275	15526
1992	3978	1372	5350	3710	1483	5193	1632	1302	436	3369	1095	536	0	12689	2856	15544
1993	4067	1824	5890	3791	1560	5351	1708	1315	433	3457	1180	552	0	13047	3384	16431
1994	4207	1584	5791	3905	1302	5207	1803	1330	447	3579	1272	559	0	13521	2886	16408
1995	5082	2097	7179	3300	1489	4789	1787	1072	416	3274	1329	621	0	13606	3586	17192
1996	4309	2720	7029	4100	1731	5831	1831	1399	453	3683	1074	572	0	13738	4451	18189
1997	4562	1980	6542	4326	1885	6211	1972	1556	486	4015	1227	572	0	14702	3865	18567
1998	5066	2134	7200	4691	1804	6495	2052	1694	452	4198	1027	616	0	15599	3938	19537
1999	5191	1755	6946	4743	1708	6451	1943	1602	418	3963	1386	671	0	15955	3462	19417
2000	5010	2659	7668	4478	1900	6378	1779	1532	388	3699	1257	656	0	15099	4559	19658
2001	4483	2883	7366	3989	1956	5945	1752	1424	354	3530	1123	590	0	13715	4839	18554
2002	4844	2854	7698	4438	2000	6438	1913	1287	372	3572	1195	660	0	14709	4854	19563
2003	4793	2823	7616	4394	1966	6359	1822	1288	362	3472	1178	651	0	14487	4788	19275
2004	4893	2869	7762	4566	2021	6587	1790	1329	361	3480	1261	665	1	14866	4890	19756
2005	5001	2914	7915	4655	2050	6705	1851	1380	363	3593	1268	677	1	15195	4964	20159
2006	5112	2933	8046	4755	2081	6836	1891	1412	364	3667	1278	689	2	15503	5014	20517
2007	5227	2961	8188	4825	2103	6929	1898	1452	361	3711	1280	700	2	15745	5064	20809
2008	5370	2990	8359	4943	2142	7086	1882	1518	361	3761	1281	711	3	16069	5132	21201
2009	5485	3019	8504	5007	2162	7168	1852	1574	360	3786	1282	724	4	16287	5181	21468
2010	5606	3051	8657	5095	2190	7284	1844	1611	356	3811	1286	735	5	16537	5240	21777
2011	5700	3074	8775	5165	2211	7375	1830	1657	361	3848	1286	748	6	16752	5285	22038
2012	5800	3102	8902	5239	2234	7472	1820	1696	357	3873	1287	758	8	16964	5336	22300
2013	5899	3132	9031	5283	2246	7529	1807	1732	353	3891	1279	767	9	17129	5378	22507
Annual Growth Rates (%)																
1990-2000	3.2	-0.4	1.8	3.2	2.2	2.9	1.4	2.0	-0.1	1.5	-0.4	3.0		2.4	0.6	2.0
2000-2003	-1.5	2.0	-0.2	-0.6	1.1	-0.1	0.8	-5.6	-2.3	-2.1	-2.2	-0.3		-1.4	1.7	-0.7
2003-2008	2.3	1.2	1.9	2.4	1.7	2.2	0.6	3.3	-0.1	1.6	1.7	1.8		2.1	1.4	1.9
2008-2013	1.9	0.9	1.6	1.3	1.0	1.2	-0.8	2.7	-0.5	0.7	0.0	1.5	24.6	1.3	0.9	1.2
2003-2013	2.1	1.0	1.7	1.9	1.3	1.7	-0.1	3.0	-0.3	1.1	0.8	1.7		1.7	1.2	1.6

Table C-2
Staff's Outlook for the SMUD Area
End Use Peak Demand by Sector (MW)

Year	Residential			Commercial			Industrial				Agr.	TCU & Street-lighting	Electric Vehicles	Total End-use Load		
	Base Load	Weather Sensitive	Total	Base Load	Weather Sensitive	Total	Process	Assembly	Mining	Total Industrial				Base Load	Weather Sensitive	Total
1990	427	647	1074	395	282	677	48	73	20	141	19	101	0	1084	929	2013
1991	396	689	1085	372	270	643	38	79	21	138	18	103	0	1027	960	1987
1992	419	626	1045	397	216	613	43	86	15	144	20	106	0	1087	842	1929
1993	432	662	1094	408	198	606	43	88	15	147	21	101	0	1107	861	1968
1994	418	624	1042	389	189	578	36	93	16	144	21	90	0	1061	814	1875
1995	522	718	1241	370	144	514	44	72	11	126	36	122	0	1177	862	2039
1996	436	979	1416	318	198	516	39	64	10	112	31	102	0	999	1177	2177
1997	487	672	1158	447	324	771	42	107	22	172	24	114	0	1244	996	2240
1998	534	896	1429	381	283	664	40	85	12	137	36	123	0	1211	1179	2390
1999	574	790	1364	530	268	798	48	142	25	216	27	126	0	1473	1058	2531
2000	568	686	1254	532	333	864	48	132	25	205	26	117	0	1448	1018	2466
2001	481	827	1307	454	245	699	34	107	21	162	22	89	0	1207	1072	2279
2002	544	907	1451	533	275	807	40	102	24	165	25	101	0	1368	1182	2549
2003	519	868	1388	512	262	774	37	96	23	155	24	97	0	1307	1130	2437
2004	529	883	1413	522	265	786	36	98	23	158	24	98	0	1331	1148	2479
2005	541	897	1438	531	267	798	37	102	23	162	25	100	1	1359	1165	2524
2006	552	903	1455	537	269	807	38	104	23	165	25	102	1	1383	1172	2555
2007	564	909	1473	543	271	814	39	108	23	170	25	104	1	1407	1181	2587
2008	577	918	1496	549	273	822	40	112	23	175	26	106	1	1433	1191	2625
2009	589	927	1516	555	275	830	40	116	23	179	26	107	2	1459	1202	2661
2010	601	937	1538	562	277	839	41	119	22	182	27	109	2	1483	1214	2697
2011	612	945	1557	569	280	848	41	123	22	186	27	111	3	1508	1225	2733
2012	623	955	1578	575	282	857	41	126	21	189	27	113	3	1530	1237	2767
2013	635	964	1599	581	284	865	41	130	21	192	28	115	4	1553	1249	2802
Annual Growth Rates (%)																
1990-2000	2.9	0.6	1.6	3.0	1.7	2.5	0.0	6.1	2.0	3.8	3.0	1.5		2.9	0.9	2.0
2000-2003	-3.0	8.2	3.4	-1.2	-7.7	-3.6	-8.5	-10.2	-3.0	-8.9	-1.9	-6.3		-3.3	3.5	-0.4
2003-2008	2.2	1.1	1.5	1.4	0.9	1.2	1.6	3.2	0.5	2.4	1.4	1.8		1.9	1.1	1.5
2008-2013	1.9	1.0	1.3	1.2	0.8	1.0	0.8	2.9	-2.1	1.8	1.3	1.7	32.0	1.6	0.9	1.3
2003-2013	2.0	1.1	1.4	1.3	0.8	1.1	1.2	3.0	-0.8	2.1	1.3	1.7		1.7	1.0	1.4

Table C-3
Staff's Outlook for the SCE Area
End Use Peak Demand by Sector (MW)

Year	Residential			Commercial			Industrial				Agr.	TCU & Street-lighting	Electric Vehicles	Total End-use Load		
	Base Load	Weather Sensitive	Total	Base Load	Weather Sensitive	Total	Process	Assembly	Mining	Total Industrial				Base Load	Weather Sensitive	Total
1990	3388	2107	5495	3603	3070	6674	1018	1872	434	3324	755	631	0	11702	5177	16879
1991	3152	1817	4969	3627	2815	6442	986	1826	430	3243	725	638	0	11385	4632	16017
1992	3575	1970	5545	4025	3104	7129	1055	1944	410	3409	803	698	0	12511	5075	17585
1993	2987	2464	5452	3422	2614	6036	934	1713	366	3013	670	629	0	10721	5078	15799
1994	4315	2902	7217	3625	1916	5540	1076	1703	366	3144	782	628	0	12493	4818	17311
1995	4238	2867	7105	3524	1812	5336	1045	1676	358	3079	718	621	0	12180	4679	16860
1996	4233	3181	7413	3595	2020	5615	1024	1701	389	3115	732	605	0	12279	5201	17480
1997	4341	3384	7724	3700	2232	5931	1019	1827	386	3232	733	716	0	12722	5615	18338
1998	4654	3290	7944	3883	2431	6314	1055	1888	400	3342	783	721	0	13383	5721	19104
1999	4778	2887	7665	3959	1838	5797	1055	1910	390	3355	830	710	0	13631	4725	18356
2000	3931	2602	6533	4312	3049	7361	1063	2012	389	3464	851	749	0	13307	5651	18958
2001	3682	2095	5777	4020	2686	6706	958	1911	386	3256	798	690	0	12446	4781	17227
2002	3721	2048	5770	4188	2928	7116	964	1732	377	3073	827	695	0	12505	4976	17481
2003	3723	2593	6316	4196	3388	7584	933	1707	373	3013	833	692	1	12458	5981	18439
2004	3793	2648	6441	4376	3522	7899	923	1754	373	3050	860	701	2	12782	6170	18952
2005	3869	2699	6568	4508	3623	8131	961	1829	376	3166	878	709	3	13133	6322	19455
2006	3954	2729	6683	4604	3699	8303	989	1892	378	3259	895	720	5	13437	6428	19865
2007	4039	2763	6802	4642	3720	8362	995	1939	375	3309	913	731	6	13640	6483	20123
2008	4145	2799	6944	4694	3753	8447	991	1981	376	3348	933	741	7	13867	6552	20419
2009	4231	2836	7067	4733	3776	8509	977	2018	376	3371	953	751	9	14048	6612	20659
2010	4322	2874	7196	4770	3797	8568	974	2051	373	3398	973	762	11	14236	6672	20908
2011	4402	2911	7314	4824	3832	8656	970	2098	378	3445	992	773	15	14452	6743	21195
2012	4485	2951	7435	4902	3884	8786	967	2126	374	3467	1012	783	19	14668	6835	21503
2013	4566	2991	7557	4924	3895	8819	963	2154	370	3488	1028	792	22	14820	6887	21707
Annual Growth Rates (%)																
1990-2000	1.5	2.1	1.7	1.8	-0.1	1.0	0.4	0.7	-1.1	0.4	1.2	1.7		1.3	0.9	1.2
2000-2003	-1.8	-0.1	-1.1	-0.9	3.6	1.0	-4.2	-5.3	-1.4	-4.5	-0.7	-2.6		-2.2	1.9	-0.9
2003-2008	2.2	1.5	1.9	2.3	2.1	2.2	1.2	3.0	0.2	2.1	2.3	1.4		2.2	1.8	2.1
2008-2013	2.0	1.3	1.7	1.0	0.7	0.9	-0.6	1.7	-0.3	0.8	2.0	1.4	25.7	1.3	1.0	1.2
2003-2013	2.1	1.4	1.8	1.6	1.4	1.5	0.3	2.4	-0.1	1.5	2.1	1.4		1.8	1.4	1.6

Table C-4
Staff's Outlook for the LADWP Area
End Use Peak Demand by Sector (MW)

Year	Residential			Commercial			Industrial				Agr.	TCU & Street-lighting	Electric Vehicles	Total End-use Load		
	Base Load	Weather Sensitive	Total	Base Load	Weather Sensitive	Total	Process	Assembly	Mining	Total Industrial				Base Load	Weather Sensitive	Total
1990	918	592	1510	1566	669	2235	292	507	58	856	16	302	0	3659	1261	4920
1991	833	818	1651	1480	542	2022	276	456	56	788	16	295	0	3411	1360	4771
1992	903	648	1551	1587	681	2268	289	471	53	813	17	308	0	3628	1329	4957
1993	749	637	1386	1351	707	2059	237	367	40	644	15	274	0	3034	1344	4378
1994	787	870	1657	1440	663	2104	253	354	46	653	16	287	0	3182	1534	4716
1995	778	692	1470	1455	766	2222	231	371	73	675	16	283	0	3207	1458	4665
1996	834	751	1585	1566	597	2163	292	380	81	754	17	295	0	3466	1348	4814
1997	809	740	1550	1482	1230	2712	237	361	71	668	17	301	0	3277	1971	5248
1998	820	650	1470	1452	1361	2813	234	359	70	663	17	296	0	3248	2011	5259
1999	970	650	1620	1703	621	2324	271	410	73	753	20	350	0	3796	1271	5067
2000	901	620	1521	1594	833	2427	251	363	61	676	19	344	0	3533	1453	4986
2001	765	577	1342	1394	849	2242	211	365	59	636	16	295	0	3105	1425	4530
2002	748	586	1334	1439	950	2389	212	332	57	601	16	285	0	3089	1536	4624
2003	813	642	1455	1578	1030	2608	229	360	62	651	17	309	0	3367	1673	5040
2004	821	644	1465	1603	1037	2640	224	369	62	655	17	310	1	3407	1682	5088
2005	831	647	1478	1622	1042	2664	232	382	62	675	17	310	1	3457	1689	5146
2006	843	646	1489	1634	1042	2677	234	390	62	686	17	314	2	3496	1689	5185
2007	854	646	1500	1644	1042	2685	228	396	62	686	18	316	3	3521	1688	5208
2008	869	646	1515	1653	1040	2694	222	403	62	686	18	319	3	3548	1686	5234
2009	880	647	1527	1664	1040	2703	211	407	62	680	18	321	4	3566	1686	5252
2010	892	647	1539	1672	1038	2710	208	411	61	680	18	323	5	3590	1686	5276
2011	903	649	1551	1682	1037	2719	205	418	62	685	18	327	6	3620	1686	5306
2012	913	650	1563	1691	1036	2727	201	422	61	683	18	329	8	3642	1686	5328
2013	924	652	1576	1708	1039	2747	197	425	61	682	18	330	9	3672	1691	5363
Annual Growth Rates (%)																
1990-2000	-0.2	0.5	0.1	0.2	2.2	0.8	-1.5	-3.3	0.5	-2.3	1.5	1.3		-0.3	1.4	0.1
2000-2003	-3.4	1.2	-1.5	-0.3	7.4	2.4	-3.0	-0.3	0.2	-1.3	-3.0	-3.6		-1.6	4.8	0.4
2003-2008	1.3	0.1	0.8	0.9	0.2	0.6	-0.7	2.2	0.1	1.1	0.7	0.6		1.0	0.2	0.8
2008-2013	1.2	0.2	0.8	0.7	0.0	0.4	-2.4	1.1	-0.3	-0.1	0.9	0.7	24.6	0.7	0.1	0.5
2003-2013	1.3	0.2	0.8	0.8	0.1	0.5	-1.5	1.7	-0.1	0.5	0.8	0.7		0.9	0.1	0.6

Table C-5
Staff's Outlook for the SDG&E Area
End Use Peak Demand by Sector (MW)

Year	Residential			Commercial			Industrial				Agr.	TCU & Street-lighting	Electric Vehicles	Total End-use Load		
	Base Load	Weather Sensitive	Total	Base Load	Weather Sensitive	Total	Process	Assembly	Mining	Total Industrial				Base Load	Weather Sensitive	Total
1990	731	197	928	798	519	1317	12	250	42	305	25	205	0	2064	716	2780
1991	786	143	930	893	421	1315	11	269	42	322	26	235	0	2263	565	2828
1992	767	230	997	875	631	1506	11	264	39	314	26	233	0	2215	861	3076
1993	699	180	880	822	484	1306	10	234	27	272	23	216	0	2032	665	2697
1994	774	289	1063	891	592	1483	11	257	26	294	26	241	0	2226	881	3107
1995	795	229	1025	922	532	1454	12	258	33	303	27	247	0	2294	761	3055
1996	801	247	1048	929	539	1467	14	284	33	331	27	232	0	2320	785	3105
1997	842	368	1210	935	698	1633	14	273	30	317	29	249	0	2372	1066	3438
1998	961	373	1334	1043	606	1649	17	341	34	392	31	289	0	2716	979	3695
1999	1027	18	1045	1110	418	1528	19	372	34	425	35	303	0	2899	436	3335
2000	906	225	1131	950	518	1467	17	309	29	355	31	245	0	2487	743	3230
2001	826	180	1006	887	428	1315	16	284	28	328	27	232	0	2301	608	2909
2002	842	428	1270	922	591	1513	16	233	28	278	29	235	0	2306	1019	3325
2003	903	464	1366	984	624	1608	17	245	30	291	31	249	0	2458	1088	3546
2004	922	476	1399	1011	635	1646	16	250	29	296	33	253	0	2515	1112	3626
2005	944	490	1434	1033	645	1678	16	259	29	305	34	257	0	2573	1134	3707
2006	965	498	1463	1057	655	1712	17	268	29	314	35	261	1	2632	1152	3785
2007	986	506	1492	1072	660	1731	17	276	29	321	35	265	1	2681	1166	3846
2008	1012	514	1526	1097	671	1768	17	284	29	330	36	269	1	2746	1185	3931
2009	1034	522	1556	1110	675	1785	17	292	29	338	37	273	1	2793	1197	3990
2010	1055	529	1584	1121	679	1800	17	298	29	345	37	276	1	2835	1208	4043
2011	1073	536	1609	1136	684	1820	17	307	29	353	38	279	2	2881	1219	4100
2012	1092	542	1635	1158	693	1851	17	312	29	359	38	282	2	2931	1235	4167
2013	1111	550	1661	1167	695	1862	18	317	29	364	39	285	3	2969	1245	4215
Annual Growth Rates (%)																
1990-2000	2.2	1.4	2.0	1.8	0.0	1.1	3.4	2.1	-3.7	1.5	1.8	1.8		1.9	0.4	1.5
2000-2003	-0.1	27.2	6.5	1.2	6.5	3.1	-1.7	-7.4	1.2	-6.4	1.0	0.5		-0.4	13.6	3.2
2003-2008	2.3	2.1	2.2	2.2	1.4	1.9	0.6	3.0	-0.4	2.5	2.8	1.6		2.2	1.7	2.1
2008-2013	1.9	1.3	1.7	1.2	0.7	1.0	0.5	2.2	0.1	2.0	1.4	1.2	24.6	1.6	1.0	1.4
2003-2013	2.1	1.7	2.0	1.7	1.1	1.5	0.6	2.6	-0.1	2.3	2.1	1.4		1.9	1.4	1.7

Table C-6
Staff's Outlook for the BGP Area
End Use Peak Demand by Sector (MW)

Year	Residential			Commercial			Industrial				Agr.	TCU & Street-lighting	Electric Vehicles	Total End-use Load		
	Base Load	Weather Sensitive	Total	Base Load	Weather Sensitive	Total	Process	Assembly	Mining	Total Industrial				Base Load	Weather Sensitive	Total
1990	122	184	306	228	118	345	5	88	10	104	3	15	0	471	302	773
1991	111	183	294	222	109	330	4	64	9	77	2	14	0	426	292	718
1992	114	192	307	231	136	367	4	62	10	76	2	15	0	438	329	767
1993	109	154	263	227	110	337	4	50	9	64	2	14	0	415	264	679
1994	107	206	314	232	140	372	4	44	10	58	2	13	0	414	346	760
1995	113	162	276	260	138	397	5	38	10	53	2	14	0	443	300	743
1996	117	182	299	270	112	382	4	37	12	52	2	14	0	455	294	749
1997	113	167	280	268	192	460	4	36	10	50	2	19	0	451	359	810
1998	121	152	273	281	220	501	4	38	12	53	3	18	0	476	372	848
1999	120	142	262	277	194	471	3	36	9	48	3	16	0	464	336	800
2000	120	146	266	280	174	454	3	31	10	45	3	18	0	465	320	785
2001	103	130	233	245	154	399	2	28	11	41	3	18	0	410	284	694
2002	104	145	249	266	171	437	3	26	11	40	3	18	0	430	316	746
2003	114	159	273	294	188	483	3	29	12	44	3	20	0	475	347	822
2004	115	159	274	300	190	490	3	30	12	44	3	20	0	482	350	831
2005	116	160	276	303	191	495	3	31	12	45	3	20	0	488	351	839
2006	117	159	276	305	192	497	3	31	12	46	3	20	0	492	351	843
2007	118	159	277	305	192	497	3	32	12	47	3	21	0	494	351	845
2008	120	159	279	305	191	495	3	32	12	47	3	21	0	496	349	845
2009	121	158	279	305	190	495	3	32	12	47	3	21	0	497	349	846
2010	122	158	281	305	190	494	3	32	12	48	3	22	1	500	348	848
2011	123	158	282	305	189	493	3	33	12	48	3	22	1	502	347	849
2012	124	158	283	304	188	493	3	33	12	48	3	22	1	503	347	850
2013	125	159	284	304	187	492	3	33	12	48	3	23	1	504	346	850
Annual Growth Rates (%)																
1990-2000	-0.2	-2.3	-1.4	2.1	4.0	2.8	-4.9	-9.9	0.0	-8.1	-0.2	2.0		-0.1	0.6	0.2
2000-2003	-1.5	2.8	0.9	1.7	2.7	2.1	-2.6	-2.5	4.6	-0.8	0.6	2.9		0.7	2.7	1.6
2003-2008	0.9	0.0	0.4	0.7	0.2	0.5	2.2	2.3	0.2	1.7	0.0	1.4		0.9	0.1	0.6
2008-2013	0.9	0.0	0.4	0.0	-0.3	-0.2	1.1	0.5	-0.3	0.3	0.0	1.5		0.3	-0.2	0.1
2003-2013	0.9	0.0	0.4	0.3	-0.1	0.2	1.7	1.4	-0.1	1.0	0.0	1.5		0.6	0.0	0.3

TABLE C-7
Staff's Outlook for the State
End Use Peak Demand by Utility (MW)

Year	PG&E	SMUD	SCE	LADWP	SDG&E	BGP	DWR	Other	Total
1990	16,203	2,013	16,879	4,920	2,780	773	227	756	44,550
1991	15,526	1,987	16,017	4,771	2,828	718	375	759	42,980
1992	15,544	1,929	17,585	4,957	3,076	767	242	802	44,902
1993	16,431	1,968	15,799	4,378	2,697	679	208	822	42,982
1994	16,408	1,875	17,311	4,716	3,107	760	88	858	45,122
1995	17,192	2,039	16,860	4,665	3,055	743	236	872	45,662
1996	18,189	2,177	17,480	4,814	3,105	749	398	909	47,821
1997	18,567	2,240	18,338	5,248	3,438	810	237	907	49,785
1998	19,537	2,390	19,104	5,259	3,695	848	236	893	51,961
1999	19,417	2,531	18,356	5,067	3,335	800	236	915	50,658
2000	19,658	2,466	18,958	4,986	3,230	785	236	965	51,283
2001	18,554	2,279	17,227	4,530	2,909	694	124	966	47,284
2002	19,563	2,549	17,481	4,624	3,325	746	322	971	49,582
2003	19,275	2,437	18,439	5,040	3,546	822	322	990	50,871
2004	19,756	2,479	18,952	5,088	3,626	831	322	1,018	52,073
2005	20,159	2,524	19,455	5,146	3,707	839	322	1,041	53,192
2006	20,517	2,555	19,865	5,185	3,785	843	322	1,068	54,139
2007	20,809	2,587	20,123	5,208	3,846	845	322	1,083	54,823
2008	21,201	2,625	20,419	5,234	3,931	845	322	1,106	55,682
2009	21,468	2,661	20,659	5,252	3,990	846	322	1,129	56,328
2010	21,777	2,697	20,908	5,276	4,043	848	322	1,166	57,037
2011	22,038	2,733	21,195	5,306	4,100	849	322	1,196	57,739
2012	22,300	2,767	21,503	5,328	4,167	850	322	1,236	58,472
2013	22,507	2,802	21,707	5,363	4,215	850	322	1,278	59,043
Annual Growth Rates (%)									
1990-2000	2.0	2.0	1.2	0.1	1.5	0.2	0.4	2.5	1.4
2000-2001	-5.6	-7.6	-9.1	-9.1	-9.9	-11.6	-47.4	0.1	-7.8
2000-2003	-0.7	-0.4	-0.9	0.4	3.2	1.6	10.9	0.8	-0.3
2003-2008	1.9	1.5	2.1	0.8	2.1	0.6	0.0	2.2	1.8
2008-2013	1.2	1.3	1.2	0.5	1.4	0.1	0.0	2.9	1.2
2003-2013	1.6	1.4	1.6	0.6	1.7	0.3	0.0	2.6	1.5

Table C-8
Staff's Outlook for the State
End Use Peak Demand by Sector (MW)

Year	Residential			Commercial			Industrial				Agr.	Other	Electric Vehicles	Total End-use Load		
	Base Load	Weather Sensitive	Total	Base Load	Weather Sensitive	Total	Process	Assembly	Mining	Total Industrial				Base Load	Weather Sensitive	Total
1990	9234	6493	15727	9856	6184	16040	2929	4045	958	7933	2351	2499	0	31874	12677	44550
1991	8963	6587	15550	9804	5497	15301	2538	3897	968	7403	2191	2534	0	30896	12084	42980
1992	9755	5040	14795	10826	6251	17077	3035	4128	963	8126	2206	2698	0	33611	11291	44902
1993	9043	5921	14964	10020	5674	15695	2937	3768	891	7596	2118	2608	0	31386	11596	42982
1994	10607	6476	17083	10482	4802	15284	3182	3781	910	7873	2206	2675	0	33843	11278	45122
1995	11529	6767	18296	9830	4881	14711	3123	3487	901	7511	2364	2780	0	34014	11648	45662
1996	10731	8060	18791	10778	5196	15975	3204	3864	977	8046	2281	2729	0	34565	13256	47821
1997	11154	7311	18465	11158	6561	17719	3288	4161	1005	8454	2269	2878	0	35913	13872	49785
1998	12157	7494	19651	11731	6705	18436	3401	4406	980	8786	2132	2956	0	37762	14199	51961
1999	12660	6241	18901	12322	5047	17369	3339	4472	949	8760	2537	3091	0	39369	11289	50658
2000	11436	6938	18373	12145	6806	18951	3161	4380	902	8443	2421	3095	0	37539	13743	51283
2001	10340	6692	17032	10989	6318	17307	2973	4120	860	7954	2113	2880	0	34275	13010	47284
2002	10804	6968	17772	11785	6915	18700	3148	3712	869	7729	2416	2965	0	35698	13883	49582
2003	10866	7549	18414	11958	7459	19416	3040	3725	860	7625	2408	3006	1	35864	15007	50871
2004	11074	7680	18754	12377	7671	20049	2993	3830	860	7683	2520	3064	4	36722	15351	52073
2005	11302	7807	19109	12653	7819	20471	3100	3982	865	7947	2546	3113	6	37567	15625	53192
2006	11543	7869	19412	12893	7938	20831	3171	4098	869	8138	2574	3174	11	38333	15807	54139
2007	11788	7944	19732	13031	7987	21018	3180	4202	862	8244	2596	3219	13	38891	15932	54823
2008	12093	8025	20118	13241	8070	21311	3154	4330	864	8347	2618	3272	15	39586	16096	55682
2009	12339	8110	20449	13373	8117	21491	3101	4440	862	8402	2640	3326	20	40100	16227	56328
2010	12598	8197	20796	13525	8171	21695	3086	4523	854	8463	2665	3393	25	40669	16368	57037
2011	12814	8273	21087	13679	8232	21912	3066	4636	864	8566	2685	3456	33	41233	16506	57739
2012	13039	8358	21396	13868	8318	22186	3049	4715	855	8619	2707	3523	41	41797	16675	58472
2013	13260	8448	21709	13967	8348	22314	3029	4790	846	8665	2716	3591	48	42247	16796	59043
Annual Growth Rates (%)																
1990-2000	2.2	0.7	1.6	2.1	1.0	1.7	0.8	0.8	-0.6	0.6	0.3	2.2		1.6	0.8	1.4
2000-2003	-1.7	2.9	0.1	-0.5	3.1	0.8	-1.3	-5.3	-1.6	-3.3	-0.2	-1.0		-1.5	3.0	-0.3
2003-2008	2.2	1.2	1.8	2.1	1.6	1.9	0.7	3.1	0.1	1.8	1.7	1.7		2.0	1.4	1.8
2008-2013	1.9	1.0	1.5	1.1	0.7	0.9	-0.8	2.0	-0.4	0.8	0.7	1.9	26.2	1.3	0.9	1.2
2003-2013	2.0	1.1	1.7	1.6	1.1	1.4	0.0	2.5	-0.2	1.3	1.2	1.8	47.3	1.7	1.1	1.5

Other includes TCU, Streetlighting, and the Other planning area
Agriculture includes all DWR

Table D-1
Staff's Outlook for the PG&E Area
Peak Demand (MW)

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Peak Demand	Load Factor (%)
1990	16,203	1,525	17,728	478	17,250	60.1
1991	15,526	1,459	16,985	488	16,497	62.8
1992	15,544	1,462	17,006	473	16,533	63.7
1993	16,431	1,546	17,977	488	17,489	60.1
1994	16,408	1,518	17,926	753	17,173	61.3
1995	17,192	1,593	18,785	769	18,016	59.2
1996	18,189	1,687	19,876	799	19,077	57.1
1997	18,567	1,721	20,288	829	19,459	58.2
1998	19,537	1,813	21,350	841	20,509	54.9
1999	19,417	1,801	21,218	849	20,369	57.6
2000	19,658	1,824	21,482	854	20,628	58.7
2001	18,554	1,717	20,271	858	19,413	60.3
2002	19,563	1,811	21,374	890	20,484	56.3
2003	19,275	1,781	21,056	912	20,145	57.8
2004	19,756	1,827	21,583	921	20,662	57.8
2005	20,159	1,865	22,024	930	21,094	57.8
2006	20,517	1,899	22,416	939	21,477	57.9
2007	20,809	1,926	22,736	949	21,787	57.9
2008	21,201	1,964	23,164	958	22,206	58.0
2009	21,468	1,988	23,456	968	22,488	58.0
2010	21,777	2,018	23,795	977	22,817	58.0
2011	22,038	2,042	24,080	987	23,092	58.0
2012	22,300	2,066	24,366	997	23,369	58.0
2013	22,507	2,085	24,592	1,007	23,585	58.0

Annual Growth Rates (%)

1990-2000	2.0	1.8	1.9	6.0	1.8
2000-2001	-5.6	-5.9	-5.6	0.5	-5.9
2000-2003	-0.7	-0.8	-0.7	2.2	-0.8
2003-2008	1.9	2.0	1.9	1.0	2.0
2008-2013	1.2	1.2	1.2	1.0	1.2
2003-2013	1.6	1.6	1.6	1.0	1.6

Historic data through 2002

Table D-2
Staff's Outlook for the SMUD Area
Peak Demand (MW)

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Peak Demand	Load Factor (%)
1990	2,013	182	2,195	0	2,195	46.3
1991	1,987	179	2,166	0	2,166	46.8
1992	1,929	174	2,103	0	2,103	49.1
1993	1,968	178	2,146	0	2,146	47.7
1994	1,875	169	2,044	0	2,044	50.0
1995	2,039	184	2,223	0	2,223	46.2
1996	2,177	196	2,373	0	2,373	45.1
1997	2,240	202	2,442	0	2,442	44.8
1998	2,390	216	2,606	0	2,606	42.5
1999	2,531	228	2,759	0	2,759	41.1
2000	2,466	222	2,688	0	2,688	42.9
2001	2,279	206	2,485	0	2,485	45.6
2002	2,549	230	2,779	0	2,779	41.2
2003	2,437	220	2,657	0	2,657	43.7
2004	2,479	224	2,703	0	2,703	43.7
2005	2,524	228	2,752	0	2,752	43.7
2006	2,555	230	2,785	0	2,785	43.9
2007	2,587	233	2,821	0	2,821	44.0
2008	2,625	237	2,861	0	2,861	44.1
2009	2,661	240	2,901	0	2,901	44.2
2010	2,697	243	2,941	0	2,941	44.2
2011	2,733	247	2,979	0	2,979	44.3
2012	2,767	250	3,017	0	3,017	44.4
2013	2,802	253	3,055	0	3,055	44.4

Annual Growth Rates (%)

2000-2001	-7.6	-7.6	-7.6		-7.6
2000-2003	-0.4	-0.4	-0.4		-0.4
2003-2008	1.5	1.5	1.5		1.5
2008-2013	1.3	1.3	1.3		1.3
2003-2013	1.4	1.4	1.4		1.4

Historic data through 2002

Table D-3
Staff's Outlook for the SCE Area
Peak Demand (MW)

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Peak Demand	Load Factor (%)
1990	16,879	1,246	18,125	478	17,647	54.1
1991	16,017	1,180	17,197	488	16,709	56.1
1992	17,585	1,301	18,886	473	18,413	52.1
1993	15,799	1,164	16,963	488	16,475	57.3
1994	17,311	1,274	18,585	541	18,044	53.4
1995	16,860	1,239	18,099	551	17,548	55.0
1996	17,480	1,286	18,766	559	18,207	54.8
1997	18,338	1,350	19,688	570	19,118	53.8
1998	19,104	1,408	20,512	577	19,935	51.6
1999	18,356	1,351	19,707	585	19,122	55.5
2000	18,958	1,395	20,353	596	19,757	57.1
2001	17,227	1,264	18,491	601	17,890	59.3
2002	17,481	1,279	18,760	655	18,105	57.3
2003	18,439	1,350	19,790	672	19,118	54.8
2004	18,952	1,389	20,341	679	19,662	54.8
2005	19,455	1,426	20,881	686	20,196	54.8
2006	19,865	1,457	21,322	692	20,629	55.0
2007	20,123	1,476	21,599	699	20,900	55.1
2008	20,419	1,498	21,917	706	21,211	55.2
2009	20,659	1,516	22,175	713	21,462	55.3
2010	20,908	1,534	22,442	721	21,721	55.4
2011	21,195	1,555	22,750	728	22,022	55.4
2012	21,503	1,578	23,081	735	22,346	55.5
2013	21,707	1,593	23,300	742	22,558	55.5

Annual Growth Rates (%)					
2000-2001	-9.1	-9.4	-9.1	0.8	-9.4
2000-2003	-0.9	-1.1	-0.9	4.1	-1.1
2003-2008	2.1	2.1	2.1	1.0	2.1
2008-2013	1.2	1.2	1.2	1.0	1.2
2003-2013	1.6	1.7	1.6	1.0	1.7

Historic data through 2002

Table D-4
Staff's Outlook for the LADWP Area
Peak Demand (MW)

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Peak Demand	Load Factor (%)
1990	4,920	0	4,920	117	4,803	56.5
1991	4,771	0	4,771	138	4,633	57.2
1992	4,957	0	4,957	151	4,806	56.5
1993	4,378	0	4,378	146	4,232	65.1
1994	4,716	0	4,716	191	4,525	58.1
1995	4,665	0	4,665	206	4,459	60.8
1996	4,814	0	4,814	209	4,605	59.7
1997	5,248	0	5,248	209	5,039	55.6
1998	5,259	0	5,259	209	5,050	54.9
1999	5,067	0	5,067	209	4,858	57.2
2000	4,986	538	5,524	180	5,344	53.7
2001	4,530	484	5,014	209	4,805	58.2
2002	4,624	495	5,119	209	4,910	57.3
2003	5,040	541	5,581	209	5,372	53.0
2004	5,088	546	5,635	209	5,426	53.1
2005	5,146	553	5,699	209	5,490	53.3
2006	5,185	557	5,742	209	5,533	53.5
2007	5,208	560	5,768	209	5,559	53.6
2008	5,234	563	5,797	209	5,588	53.8
2009	5,252	565	5,817	209	5,608	53.9
2010	5,276	568	5,843	209	5,634	54.1
2011	5,306	571	5,877	209	5,668	54.2
2012	5,328	573	5,902	209	5,693	54.4
2013	5,363	577	5,940	209	5,731	54.5

Annual Growth Rates (%)

2000-2001	-9.1	-10.1	-9.2	16.1	-10.1
2000-2003	0.4	0.2	0.3	5.1	0.2
2003-2008	0.8	0.8	0.8	0.0	0.8
2008-2013	0.5	0.5	0.5	0.0	0.5
2003-2013	0.6	0.6	0.6	0.0	0.6

Historic data through 2002

Table D-5
Staff's Outlook for the SDG&E Area
Peak Demand (MW)

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Peak Demand	Load Factor (%)
1990	2,780	0	2,780	0	2,780	63.0
1991	2,828	0	2,828	0	2,828	61.3
1992	3,076	0	3,076	0	3,076	60.0
1993	2,697	0	2,697	0	2,697	68.2
1994	3,107	0	3,107	0	3,107	60.5
1995	3,055	0	3,055	0	3,055	62.1
1996	3,105	0	3,105	0	3,105	63.2
1997	3,438	0	3,438	0	3,438	59.6
1998	3,695	0	3,695	0	3,695	57.1
1999	3,335	0	3,335	0	3,335	65.7
2000	3,230	310	3,540	0	3,540	63.6
2001	2,909	279	3,189	0	3,189	67.0
2002	3,325	312	3,638	71	3,567	61.1
2003	3,546	333	3,880	74	3,806	57.9
2004	3,626	341	3,967	75	3,893	57.9
2005	3,707	349	4,056	75	3,980	58.0
2006	3,785	356	4,141	76	4,065	58.1
2007	3,846	362	4,208	77	4,131	58.2
2008	3,931	370	4,301	78	4,223	58.4
2009	3,990	376	4,366	79	4,287	58.5
2010	4,043	381	4,423	79	4,344	58.6
2011	4,100	386	4,486	80	4,406	58.7
2012	4,167	392	4,559	81	4,478	58.8
2013	4,215	397	4,611	82	4,530	58.8

Annual Growth Rates (%)

2000-2001	-9.9	-9.9	-9.9		-9.9
2000-2003	3.2	2.4	3.1		2.4
2003-2008	2.1	2.1	2.1	1.0	2.1
2008-2013	1.4	1.4	1.4	1.0	1.4
2003-2013	1.7	1.8	1.7	1.0	1.8

Historic data through 2002

Table D-6
Staff's Outlook for the BGP Area
Peak Demand (MW)

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Peak Demand	Load Factor (%)
1990	773	39	812	0	812	44.1
1991	718	37	755	0	755	44.4
1992	767	39	806	0	806	44.2
1993	679	35	714	0	714	51.0
1994	760	39	799	0	799	45.6
1995	743	38	781	0	781	48.0
1996	749	38	787	0	787	48.6
1997	810	41	851	0	851	46.2
1998	848	43	891	0	891	44.9
1999	800	41	841	0	841	46.8
2000	785	40	825	0	825	48.9
2001	694	35	729	0	729	54.5
2002	746	38	784	0	784	51.8
2003	822	42	864	0	864	47.5
2004	831	42	874	0	874	47.7
2005	839	43	882	0	882	47.8
2006	843	43	887	0	887	48.0
2007	845	43	888	0	888	48.1
2008	845	43	888	0	888	48.3
2009	846	43	889	0	889	48.4
2010	848	43	891	0	891	48.4
2011	849	43	892	0	892	48.6
2012	850	43	893	0	893	48.7
2013	850	43	894	0	894	48.8

Annual Growth Rates (%)

2000-2001	-11.6	-11.6	-11.6		-11.6	
2000-2003	1.6	1.6	1.6		1.6	
2003-2008	0.6	0.6	0.6		0.6	
2008-2013	0.1	0.1	0.1		0.1	
2003-2013	0.3	0.3	0.3		0.3	

Historic data through 2002

Table D-7
Staff's Outlook for the Other Area
Peak Demand (MW)

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Peak Demand	Load Factor (%)
1990	756	45	801	0	801	53.2
1991	759	46	804	0	804	53.2
1992	802	48	850	0	850	53.2
1993	822	49	872	0	872	53.2
1994	858	51	909	0	909	53.2
1995	872	52	924	0	924	53.2
1996	909	55	964	0	964	53.2
1997	907	54	961	0	961	53.2
1998	893	54	947	0	947	53.2
1999	915	55	970	0	970	53.2
2000	965	58	1,023	0	1,023	53.2
2001	966	58	1,024	0	1,024	53.2
2002	971	58	1,029	0	1,029	52.5
2003	990	59	1,049	0	1,049	52.3
2004	1,018	61	1,079	0	1,079	52.3
2005	1,041	62	1,103	0	1,103	52.1
2006	1,068	64	1,132	0	1,132	52.1
2007	1,083	65	1,148	0	1,148	52.1
2008	1,106	66	1,172	0	1,172	52.1
2009	1,129	68	1,197	0	1,197	52.0
2010	1,166	70	1,236	0	1,236	51.9
2011	1,196	72	1,268	0	1,268	51.8
2012	1,236	74	1,310	0	1,310	51.7
2013	1,278	77	1,354	0	1,354	51.5

Annual Growth Rates (%)

2000-2001	0.1	0.1	0.1		0.1	
2000-2003	0.8	0.8	0.8		0.8	
2003-2008	2.2	2.2	2.2		2.2	
2008-2013	2.9	2.9	2.9		2.9	
2003-2013	2.6	2.6	2.6		2.6	

Historic data through 2002

Table D-8
Staff's Outlook for the DWR Area
Peak Demand (MW)

Year	Total End Use Load	Losses	Coincident Peak Demand
1990	227	14	241
1991	375	22	397
1992	242	14	256
1993	208	12	220
1994	88	5	93
1995	236	14	250
1996	398	24	422
1997	237	14	251
1998	236	14	250
1999	236	14	250
2000	236	14	250
2001	124	7	131
2002	322	19	341
2003	322	19	341
2004	322	19	341
2005	322	19	341
2006	322	19	341
2007	322	19	341
2008	322	19	341
2009	322	19	341
2010	322	19	341
2011	322	19	341
2012	322	19	341
2013	322	19	341
Annual Growth Rates (%)			
1990-2000	0.4	0.4	0.4
2000-2003	10.9	10.9	10.9
2003-2008	0.0	0.0	0.0
2008-2013	0.0	0.0	0.0
2003-2013	0.0	0.0	0.0

Historic data through 2002

Table D-9
Staff's Outlook for California
Noncoincident Peak Demand (MW)

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	CED 2003 Peak Demand	Load Factor (%)
1990	44,550	3,822	48,372	1,141	47,231	57.5
1991	42,980	3,625	46,605	1,176	45,429	58.1
1992	44,902	3,783	48,685	1,168	47,517	56.8
1993	42,982	3,614	46,596	1,185	45,411	59.3
1994	45,122	3,737	48,858	1,550	47,308	57.3
1995	45,662	3,782	49,443	1,589	47,854	56.9
1996	47,821	4,039	51,860	1,620	50,240	56.0
1997	49,785	4,125	53,910	1,660	52,250	55.7
1998	51,961	4,439	56,400	1,679	54,721	52.7
1999	50,658	4,347	55,005	1,712	53,293	56.3
2000	51,283	4,397	55,679	1,688	53,991	57.9
2001	47,284	4,046	51,331	1,706	49,625	60.6
2002	49,582	4,243	53,824	1,824	52,000	57.6
2003	50,871	4,346	55,218	1,867	53,351	56.7
2004	52,073	4,450	56,523	1,883	54,639	56.6
2005	53,192	4,545	57,737	1,900	55,837	56.7
2006	54,139	4,626	58,766	1,917	56,849	56.8
2007	54,823	4,685	59,508	1,934	57,574	56.8
2008	55,682	4,760	60,442	1,951	58,491	56.9
2009	56,328	4,815	61,143	1,969	59,174	57.0
2010	57,037	4,876	61,913	1,986	59,926	57.0
2011	57,739	4,935	62,674	2,004	60,670	57.1
2012	58,472	4,997	63,469	2,022	61,447	57.1
2013	59,043	5,045	64,088	2,040	62,048	57.1
						57
Annual Growth Rates (%)						
1990-2000	1.4	1.4	1.4	4.0	1.3	0.1
2000-2001	-7.8	-8.0	-7.8	1.1	-8.1	4.7
2000-2003	-0.3	-0.4	-0.3	3.4	-0.4	-0.7
2003-2008	1.8	1.8	1.8	0.9	1.9	0.1
2008-2013	1.2	1.2	1.2	0.9	1.2	0.1
2003-2013	1.5	1.5	1.5	0.9	1.5	0.1

Historic data through 2002

Table D-10
Staff's Baseline Outlook for the State
1 IN 2 Electric Peak Demand by ISO Congestion Zone with Municipal Sales
(MW)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Growth Rate (%) 2001-2006	Growth Rate (%) 2001-2013
PG&E North	16,653	17,706	17,371	17,792	18,160	18,496	18,763	19,124	19,367	19,650	19,887	20,125	20,311	2.12	1.67
PG&E Sales	13,719	14,615	14,332	14,664	14,971	15,253	15,477	15,782	15,986	16,225	16,424	16,625	16,784	2.14	1.69
Muni Sales	2,934	3,092	3,038	3,128	3,189	3,243	3,286	3,342	3,381	3,425	3,463	3,501	3,528	2.02	1.55
PG&E San Francisco	979	885	917	968	992	1,004	1,018	1,038	1,051	1,066	1,079	1,092	1,102	0.49	0.99
Dept of Water Resources - North	21	54	54	54	54	54	54	54	54	54	54	54	54	21.00	8.27
North of Path 15	17,653	18,645	18,341	18,814	19,206	19,553	19,835	20,215	20,472	20,770	21,020	21,271	21,467	2.07	1.64
Path 26 Pacific Gas & Electric - South	1,781	1,893	1,857	1,902	1,942	1,978	2,006	2,045	2,071	2,101	2,126	2,152	2,172	2.12	1.67
Path 26 - Dept of Water Resources	34	89	89	89	89	89	89	89	89	89	89	89	89	21.00	8.27
Total Path 26	1,815	1,982	1,947	1,992	2,031	2,067	2,095	2,134	2,160	2,190	2,216	2,241	2,261	2.63	1.85
Southern California Edison	17,890	18,105	19,118	19,662	20,196	20,629	20,900	21,211	21,462	21,721	22,022	22,346	22,558	2.89	1.95
SCE Sales	16,117	16,288	17,194	17,682	18,164	18,556	18,796	19,075	19,297	19,527	19,796	20,085	20,274	2.86	1.93
Muni Sales	1,773	1,817	1,923	1,981	2,032	2,074	2,103	2,136	2,165	2,194	2,227	2,261	2,284	3.18	2.13
Pasadena Water and Power Dept	257	277	305	308	311	313	313	313	314	314	315	315	315	3.98	1.71
San Diego Gas & Electric	3,147	3,567	3,806	3,893	3,980	4,065	4,131	4,223	4,287	4,344	4,406	4,478	4,530	5.25	3.08
Dept of Water Resources - South	76	198	198	198	198	198	198	198	198	198	198	198	198	21.00	8.27
South of Path 15	21,371	22,147	23,426	24,061	24,685	25,204	25,542	25,945	26,261	26,578	26,941	27,337	27,600	3.36	2.15
Sacramento Municipal Utilities District	2,485	2,779	2,657	2,703	2,752	2,785	2,821	2,861	2,901	2,941	2,979	3,017	3,055	2.31	1.73
Los Angeles Department of Water and Power	4,805	4,910	5,372	5,426	5,490	5,533	5,559	5,588	5,608	5,634	5,668	5,693	5,731	2.86	1.48
Burbank Public Service Dept	232	249	275	278	280	282	282	282	283	283	284	284	284	3.98	1.71
Glendale Public Service Dept	240	258	285	288	290	292	292	293	293	294	294	294	294	3.98	1.71
Imperial Irrigation District	725	750	770	791	812	833	854	875	895	915	936	956	976	2.82	2.51
Far North & East Sierra	299	279	279	288	291	299	294	297	302	321	332	354	378	0.02	1.99
Non ISO	8,786	9,226	9,637	9,773	9,915	10,024	10,102	10,196	10,282	10,388	10,493	10,598	10,719	2.67	1.67
Total ISO	43,324	42,774	43,714	44,866	45,922	46,824	47,472	48,295	48,892	49,538	50,177	50,849	51,329	1.57	1.42
Total State	49,625	52,000	53,351	54,639	55,837	56,849	57,574	58,491	59,174	59,926	60,670	61,447	62,048	2.76	1.88
														0.55	1.34
Coincident Demand															
Total ISO Coincident Demand	42,286	41,750	42,667	43,792	44,822	45,703	46,335	47,138	47,721	48,352	48,975	49,631	50,100	1.57	1.42
Total Statewide Coincident Demand	48,436	50,755	52,073	53,331	54,500	55,487	56,195	57,090	57,757	58,491	59,217	59,975	60,562	2.76	1.88

Historic data through 2002
SMUD is included in ISO total through 2001.

Table D-11
Staff's Outlook for the State
1 IN 5 Electric Peak Demand by CAISO Congestion Zone
(MW)

														Growth Rate (%)	
Noncoincident Demand	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2001-2006	2001-2013
PG&E North	16,653	17,706	18,030	18,460	18,846	19,200	19,483	19,863	20,120	20,407	20,653	20,900	21,094	2.89	1.99
PG&E San Francisco	979	885	952	1,014	1,034	1,040	1,049	1,064	1,072	1,096	1,109	1,122	1,133	1.21	1.22
Dept of Water Resources - North	21	54	54	54	54	54	54	54	54	54	54	54	54	21.00	8.27
North of Path 15	17,653	18,645	19,036	19,527	19,934	20,294	20,586	20,981	21,246	21,557	21,816	22,077	22,280	2.83	1.96
Path 26 - Pacific Gas & Electric - South	1,781	1,893	1,928	1,974	2,015	2,053	2,083	2,124	2,151	2,182	2,208	2,235	2,255	2.89	1.99
Path 26 - Dept of Water Resources	34	89	89	89	89	89	89	89	89	89	89	89	89	21.00	8.27
Total Path 26	1,815	1,982	2,017	2,063	2,104	2,142	2,172	2,213	2,240	2,271	2,297	2,324	2,345	3.37	2.16
Southern California Edison	17,890	18,105	19,748	20,311	20,862	21,310	21,590	21,911	22,170	22,438	22,749	23,083	23,302	3.56	2.23
Pasadena Water and Power Dept	257	277	320	323	326	328	328	329	329	330	330	331	331	4.98	2.11
San Diego Gas & Electric	3,147	3,567	3,929	4,019	4,109	4,196	4,265	4,360	4,426	4,485	4,549	4,623	4,677	5.92	3.36
Dept of Water Resources - South	76	198	198	198	198	198	198	198	198	198	198	198	198	21.00	8.27
South of Path 15	21,371	22,147	24,195	24,851	25,496	26,032	26,381	26,798	27,123	27,451	27,826	28,235	28,507	4.03	2.43
Sacramento Municipal Utilities District	2,485	2,779	2,758	2,806	2,856	2,891	2,928	2,970	3,012	3,052	3,093	3,131	3,171	3.07	2.05
Los Angeles Department of Water and Power	4,805	4,910	5,635	5,692	5,759	5,804	5,831	5,861	5,883	5,911	5,946	5,972	6,012	3.85	1.89
Burbank Public Service Dept	232	249	288	291	294	296	296	296	297	297	298	298	298	4.98	2.11
Glendale Public Service Dept	240	258	299	302	305	306	307	307	307	308	308	309	309	4.98	2.11
Imperial Irrigation District	725	750	792	814	836	857	879	900	921	942	963	984	1,004	3.41	2.75
Far North & East Sierra	299	279	257	265	268	275	269	272	276	294	305	326	350	-1.66	1.33
Non ISO	8,786	9,226	10,029	10,169	10,317	10,429	10,510	10,607	10,695	10,804	10,912	11,019	11,144	3.49	2.00
Total CAISO Noncoincident Demand	43,324	42,774	45,249	46,441	47,534	48,469	49,139	49,991	50,610	51,279	51,940	52,636	53,132	2.27	1.72
Total State	49,625	52,000	55,277	56,611	57,851	58,898	59,649	60,598	61,305	62,083	62,852	63,655	64,276	3.49	2.18
Coincident Demand															
Total CAISO Coincident Demand	42,286	41,750	44,165	45,329	46,396	47,308	47,962	48,794	49,398	50,051	50,696	51,375	51,860	2.27	1.72
Total Statewide Coincident Demand	48,436	50,755	53,953	55,255	56,466	57,488	58,220	59,147	59,837	60,596	61,347	62,131	62,737	3.49	2.18

Historic data through 2002
SMUD is included in ISO total through 2001.

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Table D-12
Staff's Baseline Outlook for the State
1 IN 10 Electric Peak Demand by CAISO Congestion Zone
(MW)

																Growth Rate (%)	
Noncoincident Demand	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2001-2006	2001-2013
PG&E North	17,569	17,779	16,653	17,706	18,580	19,030	19,424	19,783	20,069	20,455	20,715	21,018	21,272	21,526	21,725	3.50	2.24
PG&E San Francisco	921	948	979	885	927	979	1,004	1,015	1,030	1,050	1,063	1,079	1,092	1,105	1,115	0.72	1.09
Dept of Water Resources - North	40	40	21	54	54	54	54	54	54	54	54	54	54	54	54	21.00	8.27
North of Path 15	18,530	18,767	17,653	18,645	19,561	20,064	20,482	20,853	21,153	21,559	21,832	22,151	22,417	22,685	22,894	3.39	2.19
Path 26 - Pacific Gas & Electric - South	1,879	1,901	1,781	1,893	1,987	2,035	2,077	2,115	2,146	2,187	2,215	2,247	2,274	2,302	2,323	3.50	2.24
Path 26 - Dept of Water Resources	65	65	34	89	89	89	89	89	89	89	89	89	89	89	89	21.00	8.27
Total Path 26	1,944	1,966	1,815	1,982	2,076	2,124	2,166	2,204	2,235	2,276	2,304	2,337	2,364	2,391	2,412	3.97	2.40
Southern California Edison	19,122	19,757	17,890	18,105	20,274	20,852	21,417	21,877	22,164	22,494	22,760	23,035	23,355	23,698	23,923	4.11	2.45
Pasadena Water and Power Dept	294	291	257	277	323	326	329	331	332	332	332	333	333	334	334	5.18	2.19
San Diego Gas & Electric	3,574	3,476	3,147	3,567	3,996	4,087	4,179	4,268	4,338	4,434	4,501	4,561	4,626	4,702	4,756	6.28	3.50
Dept of Water Resources - South	145	145	76	198	198	198	198	198	198	198	198	198	198	198	198	21.00	8.27
South of Path 15	23,135	23,669	21,371	22,147	24,791	25,463	26,124	26,674	27,031	27,458	27,792	28,127	28,512	28,931	29,210	4.53	2.64
Sacramento Municipal Utilities District	2,759	2,688	2,485	2,779	2,835	2,884	2,936	2,972	3,010	3,053	3,096	3,138	3,179	3,219	3,259	3.64	2.29
Los Angeles Department of Water and Power	5,407	5,344	4,805	4,910	5,689	5,746	5,813	5,860	5,887	5,917	5,939	5,967	6,002	6,029	6,069	4.05	1.97
Burbank Public Service Dept	268	262	232	249	291	294	297	298	299	299	299	300	300	301	301	5.18	2.19
Glendale Public Service Dept	279	272	240	258	301	305	308	309	310	310	310	311	311	312	312	5.18	2.19
Imperial Irrigation District	728	705	725	750	815	837	860	882	904	926	947	969	991	1,012	1,033	3.99	3.00
Far North & East Sierra	242	318	299	279	234	242	244	250	244	246	249	267	277	298	321	-3.48	0.61
Non ISO	9,683	9,589	8,786	9,226	10,165	10,308	10,457	10,571	10,653	10,751	10,841	10,952	11,061	11,170	11,296	3.77	2.12
Total CAISO Noncoincident Demand	46,369	45,124	43,324	42,774	46,428	47,651	48,772	49,731	50,419	51,293	51,928	52,615	53,293	54,007	54,517	2.80	1.93
Total State	53,293	53,991	49,625	52,000	56,593	57,958	59,229	60,302	61,072	62,044	62,769	63,566	64,354	65,177	65,812	3.97	2.38
Coincident Demand																	
Total CAISO Coincident Demand	45,258	44,043	42,286	41,750	45,316	46,510	47,604	48,540	49,212	50,065	50,685	51,355	52,017	52,714	53,211	2.80	1.93
Total Statewide Coincident Demand	52,016	52,699	48,436	50,755	55,238	56,571	57,811	58,858	59,609	60,559	61,266	62,044	62,813	63,616	64,236	3.97	2.38

Historic data through 2002
SMUD is included in ISO total through 2001.

Table D-13
Staff's Outlook for the State
1 IN 40 Electric Peak Demand by CAISO Congestion Zone
(MW)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Growth Rate (%) 2001-2006	Growth Rate (%) 2001-2013
Noncoincident Demand																	
PG&E North	17,569	19,555	18,312	19,463	19,088	19,543	19,952	20,327	20,626	21,028	21,301	21,604	21,864	22,127	22,331	2.11	1.67
PG&E San Francisco	921	962	1,001	912	952	1,014	1,034	1,040	1,049	1,064	1,072	1,096	1,109	1,122	1,133	0.77	1.04
Dept of Water Resources - North	40	40	21	54	54	54	54	54	54	54	54	54	54	54	54	21.00	8.27
North of Path 15	18,530	20,557	19,334	20,429	20,094	20,611	21,041	21,421	21,730	22,146	22,427	22,754	23,027	23,303	23,518	2.07	1.65
Path 26 - Pacific Gas & Electric - South	1,879	2,091	1,958	2,081	2,041	2,090	2,133	2,173	2,205	2,248	2,278	2,310	2,338	2,366	2,388	2.11	1.67
Path 26 - Dept of Water Resources	65	65	34	89	89	89	89	89	89	89	89	89	89	89	89	21.00	8.27
Total Path 26	1,944	2,156	1,992	2,170	2,130	2,179	2,223	2,263	2,295	2,338	2,367	2,399	2,427	2,455	2,477	2.58	1.83
Southern California Edison	19,122	21,496	19,464	19,699	20,800	21,392	21,973	22,445	22,739	23,077	23,351	23,633	23,960	24,312	24,543	2.89	1.95
Pasadena Water and Power Dept	294	311	275	296	326	329	332	334	335	335	335	336	336	337	337	3.98	1.71
San Diego Gas & Electric	3,574	3,686	3,337	3,783	4,036	4,128	4,221	4,310	4,381	4,479	4,546	4,607	4,673	4,749	4,803	5.25	3.08
Dept of Water Resources - South	145	145	76	198	198	198	198	198	198	198	198	198	198	198	198	21.00	8.27
South of Path 15	23,135	25,638	23,153	23,975	25,359	26,048	26,724	27,287	27,652	28,089	28,430	28,773	29,167	29,596	29,881	3.34	2.15
Sacramento Municipal Utilities District	2,759	2,946	2,724	3,046	2,912	2,962	3,016	3,053	3,091	3,136	3,180	3,223	3,265	3,306	3,348	2.31	1.73
Los Angeles Department of Water and Power	5,407	5,713	5,137	5,249	5,743	5,800	5,868	5,915	5,943	5,973	5,995	6,023	6,059	6,086	6,127	2.86	1.48
Burbank Public Service Dept	268	280	248	266	294	297	300	301	302	302	302	303	303	304	304	3.98	1.71
Glendale Public Service Dept	279	291	257	276	304	308	311	312	313	313	313	314	314	315	315	3.98	1.71
Imperial Irrigation District	728	767	789	816	838	861	883	906	929	952	974	996	1,018	1,040	1,062	2.82	2.51
Far North & East Sierra	242	256	235	213	211	218	220	226	218	220	223	241	250	270	292	-0.80	1.85
Non ISO	9,683	10,253	9,389	9,866	10,301	10,446	10,598	10,713	10,796	10,896	10,987	11,099	11,210	11,320	11,447	2.67	1.67
Total CAISO Noncoincident Demand	46,369	49,141	47,203	46,574	47,584	48,837	49,987	50,971	51,677	52,573	53,224	53,927	54,622	55,354	55,876	1.55	1.42
Total State	53,293	58,604	53,868	56,440	57,885	59,284	60,585	61,684	62,472	63,468	64,211	65,026	65,831	66,673	67,323	2.75	1.88
Coincident Demand																	
Total CAISO Coincident Demand	45,258	47,964	46,072	45,459	46,444	47,668	48,790	49,750	50,439	51,314	51,949	52,635	53,314	54,028	54,538	1.55	1.42
Total Statewide Coincident Demand	52,016	57,201	52,578	55,089	56,499	57,864	59,134	60,207	60,976	61,949	62,673	63,468	64,255	65,077	65,711	2.75	1.88

Historic data through 2002
SMUD is included in ISO total through 2001.

Table D-14
Staff's Low Demand Scenario for the State
1 IN 2 Electric Peak Demand by ISO Congestion Zone with Municipal Sales
(MW)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Growth Rate (%) 2001-2006	Growth Rate (%) 2001-2013
PG&E North	17,569	17,779	16,653	17,706	17,371	17,693	17,930	18,144	18,263	18,517	18,738	19,041	19,299	19,536	19,748	1.73	1.43
PG&E/Direct Access Sales	14,488	14,565	14,689	14,663	14,403	14,908	15,341	15,764	16,104	16,355	16,535	16,761	14,882	15,063	15,205	1.42	0.29
Muni Sales	3,160	3,197	2,934	3,092	3,038	3,111	3,150	3,184	3,204	3,246	3,281	3,329	3,370	3,407	3,439	1.65	1.33
PG&E San Francisco	921	948	979	885	917	963	980	986	1,000	1,010	1,021	1,036	1,049	1,061	1,074	0.13	0.77
Dept of Water Resources - North	40	40	21	54	54	54	54	54	54	54	54	54	54	54	54	21.00	8.27
North of Path 15	18,530	18,767	17,653	18,645	18,341	18,710	18,965	19,184	19,317	19,581	19,813	20,131	20,401	20,651	20,876	1.68	1.41
Path 26 Pacific Gas & Electric - South	1,879	1,901	1,781	1,893	1,857	1,892	1,917	1,940	1,953	1,980	2,004	2,036	2,063	2,089	2,111	1.73	1.43
Path 26 - Dept of Water Resources	65	65	34	89	89	89	89	89	89	89	89	89	89	89	89	21.00	8.27
Total Path 26	1,944	1,966	1,815	1,982	1,947	1,981	2,006	2,029	2,042	2,069	2,093	2,125	2,153	2,178	2,201	2.26	1.62
Southern California Edison	19,122	19,757	17,890	18,105	19,118	19,535	19,909	20,175	20,296	20,556	20,808	21,062	21,355	21,684	21,932	2.43	1.71
SCE / Direct Access Sales	17,192	17,771	16,117	16,288	17,194	17,565	17,900	18,137	18,240	18,470	18,692	18,917	19,178	19,472	19,695	2.39	1.68
Muni Sales	1,930	1,944	1,773	1,817	1,923	1,971	2,009	2,038	2,057	2,086	2,115	2,145	2,177	2,211	2,237	2.83	1.96
Pasadena Water and Power Dept	294	291	257	277	305	307	308	307	306	306	307	307	308	308	309	3.62	1.53
San Diego Gas & Electric	3,574	3,476	3,147	3,567	3,806	3,863	3,925	3,976	4,013	4,089	4,147	4,201	4,261	4,331	4,386	4.79	2.80
Dept of Water Resources - South	145	145	76	198	198	198	198	198	198	198	198	198	198	198	198	21.00	8.27
South of Path 15	23,135	23,669	21,371	22,147	23,426	23,903	24,339	24,656	24,813	25,150	25,459	25,768	26,121	26,521	26,824	2.90	1.91
Sacramento Municipal Utilities District	2,759	2,688	2,485	2,779	2,657	2,697	2,735	2,755	2,775	2,806	2,844	2,882	2,920	2,957	2,996	2.08	1.57
Los Angeles Department of Water and Power	5,407	5,344	4,805	4,910	5,372	5,395	5,422	5,426	5,418	5,440	5,465	5,490	5,522	5,552	5,602	2.46	1.29
Burbank Public Service Dept	268	262	232	249	275	276	277	277	276	276	276	277	277	278	278	3.62	1.53
Glendale Public Service Dept	279	272	240	258	285	286	287	287	286	286	286	287	287	288	288	3.62	1.53
Imperial Irrigation District	728	705	725	750	770	791	812	833	854	875	895	915	936	956	976	2.82	2.51
Far North & East Sierra	242	318	299	279	279	282	282	277	272	273	271	274	276	279	283	-1.50	-0.45
Non ISO	9,683	9,589	8,786	9,226	9,637	9,728	9,816	9,855	9,880	9,955	10,038	10,124	10,218	10,309	10,423	2.32	1.43
Total ISO	46,369	47,090	43,324	42,774	43,714	44,594	45,310	45,869	46,172	46,800	47,365	48,023	48,675	49,350	49,901	1.15	1.18
Total State	53,293	53,991	49,625	52,000	53,351	54,321	55,126	55,724	56,052	56,755	57,402	58,147	58,893	59,659	60,324	2.35	1.64
Coincident Demand																	
Total ISO Coincident Demand	45,258	45,962	42,286	41,750	42,667	43,526	44,225	44,771	45,067	45,679	46,230	46,873	47,510	48,168	48,706	1.15	1.18
Total Statewide Coincident Demand	52,016	52,699	48,436	50,755	52,073	53,021	53,806	54,390	54,710	55,396	56,028	56,755	57,483	58,231	58,879	2.35	1.64

Table D-15
Staff's High Scenario for the State
1 IN 2 Electric Peak Demand by ISO Congestion Zone with Municipal Sales
(MW)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Growth Rate (%) 2001-2006	Growth Rate (%) 2001-2013
	17,624	17,754	17,442	18,067											
PG&E North	16,653	17,706	17,371	17,995	18,513	19,018	19,424	19,723	19,934	20,201	20,420	20,661	20,862	2.69	1.90
PG&E Sales	14,689	14,663	14,403	14,908	15,341	15,764	16,104	16,355	16,535	16,761	14,882	15,063	15,205	1.42	0.29
Muni Sales	2,934	3,092	3,038	3,160	3,245	3,328	3,395	3,443	3,476	3,518	3,552	3,590	3,619	2.55	1.76
PG&E San Francisco	979	885	917	975	1,002	1,024	1,045	1,061	1,073	1,087	1,099	1,112	1,122	0.89	1.14
Dept of Water Resources - North	21	54	54	54	54	54	54	54	54	54	54	54	54	21.00	8.27
North of Path 15	17,653	18,645	18,341	19,025	19,569	20,096	20,523	20,838	21,060	21,342	21,572	21,827	22,039	2.63	1.87
Path 26 Pacific Gas & Electric - South	1,781	1,893	1,857	1,924	1,979	2,033	2,077	2,109	2,131	2,160	2,183	2,209	2,231	2.69	1.90
Path 26 - Dept of Water Resources	34	89	89	89	89	89	89	89	89	89	89	89	89	21.00	8.27
Total Path 26	1,815	1,982	1,947	2,013	2,069	2,123	2,166	2,198	2,221	2,249	2,273	2,298	2,320	3.18	2.07
Southern California Edison	17,890	18,105	19,118	19,856	20,532	21,118	21,548	21,822	22,054	22,289	22,562	22,891	23,115	3.37	2.16
SCE Sales	16,117	16,288	17,194	17,861	18,475	19,007	19,394	19,638	19,842	20,050	20,293	20,587	20,787	3.35	2.14
Muni Sales	1,773	1,817	1,923	1,995	2,057	2,111	2,154	2,184	2,211	2,239	2,269	2,304	2,328	3.55	2.29
Pasadena Water and Power Dept	257	277	305	310	315	318	321	320	321	321	321	322	322	4.34	1.88
San Diego Gas & Electric	3,147	3,567	3,806	3,929	4,048	4,161	4,258	4,343	4,404	4,457	4,516	4,588	4,642	5.74	3.29
Dept of Water Resources - South	76	198	198	198	198	198	198	198	198	198	198	198	198	21.00	8.27
South of Path 15	21,371	22,147	23,426	24,294	25,093	25,795	26,324	26,682	26,976	27,266	27,597	27,999	28,276	3.84	2.36
Sacramento Municipal Utilities District	2,485	2,779	2,657	2,722	2,785	2,832	2,879	2,914	2,954	2,992	3,030	3,069	3,108	2.65	1.88
Los Angeles Department of Water and Power	4,805	4,910	5,372	5,469	5,567	5,645	5,705	5,729	5,749	5,770	5,797	5,822	5,862	3.27	1.67
Burbank Public Service Dept	232	249	275	280	284	287	289	289	289	289	290	290	290	4.34	1.88
Glendale Public Service Dept	240	258	285	290	294	297	299	299	300	300	300	300	301	4.34	1.88
Imperial Irrigation District	725	750	770	791	812	833	854	875	895	915	936	956	976	2.82	2.51
Far North & East Sierra	299	279	279	296	308	316	325	325	327	337	348	370	395	1.15	2.36
Non ISO	8,786	9,226	9,637	9,847	10,049	10,210	10,351	10,432	10,514	10,604	10,701	10,807	10,931	3.05	1.84
Total ISO	43,324	42,774	43,714	45,332	46,731	48,013	49,013	49,718	50,257	50,857	51,441	52,124	52,635	2.08	1.64
Total State	49,625	52,000	53,351	55,178	56,780	58,223	59,365	60,150	60,771	61,461	62,142	62,931	63,566	3.25	2.08
Coincident Demand															
Total ISO Coincident Demand	42,286	41,750	42,667	44,246	45,611	46,864	47,839	48,528	49,054	49,639	50,210	50,876	51,374	2.08	1.64
Total Statewide Coincident Demand	48,436	50,755	52,073	53,857	55,420	56,829	57,943	58,710	59,316	59,989	60,654	61,424	62,043	3.25	2.08

Table E-1
Staff's Outlook for the PG&E Planning Area
End Use Natural Gas Consumption by Sector (10^6 Therms)

Year	Residential	Commercial	Industrial	Mining	Agricultural	Transportation, Communication & Utilities	Total Consumption
1980	2,298	721	2,452	249	76	114	5,911
1981	2,079	676	2,339	228	65	118	5,505
1982	2,226	737	1,976	222	60	120	5,341
1983	2,093	706	1,293	59	53	109	4,313
1984	2,036	712	1,269	78	53	110	4,258
1985	2,236	736	1,714	240	56	116	5,098
1986	1,958	668	1,361	94	50	108	4,238
1987	2,034	707	1,566	153	57	110	4,627
1988	2,015	662	1,619	215	62	159	4,731
1989	2,168	727	1,525	227	70	121	4,838
1990	2,118	758	1,971	254	66	111	5,278
1991	2,169	746	1,735	431	61	120	5,262
1992	1,963	669	1,502	166	53	93	4,447
1993	2,126	708	1,717	99	44	94	4,788
1994	2,211	762	1,834	73	74	93	5,047
1995	1,966	697	1,959	79	60	72	4,834
1996	1,982	702	2,084	44	65	77	4,955
1997	1,978	715	1,992	167	70	95	5,017
1998	2,283	762	1,957	307	75	69	5,453
1999	2,422	880	1,766	243	94	67	5,473
2000	2,180	843	1,853	294	111	59	5,339
2001	1,970	685	1,870	304	60	76	4,964
2002	2,149	792	1,873	294	99	76	5,283
2003	2,163	799	1,907	299	100	77	5,344
2004	2,179	805	1,931	301	101	77	5,395
2005	2,195	813	1,988	306	102	78	5,482
2006	2,211	819	2,001	310	103	78	5,523
2007	2,230	823	1,983	310	104	79	5,528
2008	2,251	829	1,953	316	104	79	5,531
2009	2,272	833	1,897	319	104	79	5,505
2010	2,295	836	1,883	319	105	79	5,517
2011	2,315	840	1,870	327	105	79	5,536
2012	2,334	844	1,849	327	105	79	5,539
2013	2,355	847	1,831	327	105	80	5,545
Annual Growth Rates (%)							
1980-1990	-0.8	0.5	-2.2	0.2	-1.5	-0.3	-1.1
1990-2000	0.3	1.1	-0.6	1.5	5.3	-6.2	0.1
2000-2003	-0.3	-1.8	1.0	0.5	-3.4	9.4	3.8
2003-2008	0.8	0.7	0.5	1.1	0.8	0.5	0.7
2008-2013	0.9	0.4	-1.3	0.7	0.2	0.2	0.0
2003-2013	0.9	0.6	-0.4	0.9	0.5	0.4	0.4

Excludes natural gas used for electric generation

Table E-2
Staff's Outlook for the SCG Planning Area
End Use Natural Gas Consumption by Sector (10^6 Therms)

Year	Residential	Commercial	Industrial	Mining	Agricultural	Transportation, Communication & Utilities	Total Consumption
1980	3,184	800	2,105	927	65	87	7,168
1981	2,784	782	2,099	850	71	91	6,676
1982	3,006	835	1,779	800	61	96	6,577
1983	2,747	777	1,457	786	47	83	5,898
1984	2,545	744	1,347	830	52	81	5,599
1985	2,870	849	1,322	785	54	85	5,965
1986	2,507	775	1,251	942	44	81	5,600
1987	2,740	846	1,227	926	48	88	5,875
1988	2,741	905	1,529	1,173	53	84	6,487
1989	2,806	957	1,533	1,405	53	84	6,838
1990	2,687	952	1,280	1,761	57	70	6,806
1991	2,705	847	1,136	1,725	52	75	6,539
1992	2,694	794	1,066	1,643	52	80	6,329
1993	2,620	785	1,207	1,598	48	64	6,322
1994	2,666	831	1,230	1,543	57	64	6,390
1995	2,459	748	1,189	2,042	52	66	6,557
1996	2,482	750	1,635	2,168	61	78	7,174
1997	2,441	793	1,564	2,804	69	72	7,743
1998	2,812	852	1,730	2,872	72	78	8,416
1999	2,870	940	1,738	2,634	86	79	8,347
2000	2,692	916	1,705	2,465	90	71	7,939
2001	2,707	901	1,536	2,679	77	66	7,966
2002	2,617	919	1,519	2,584	87	65	7,792
2003	2,637	940	1,548	2,631	87	64	7,907
2004	2,658	965	1,581	2,642	87	63	7,996
2005	2,678	986	1,637	2,680	87	62	8,131
2006	2,701	1,008	1,662	2,712	87	62	8,232
2007	2,726	1,018	1,650	2,703	88	62	8,247
2008	2,753	1,028	1,638	2,744	88	62	8,312
2009	2,780	1,037	1,601	2,775	88	62	8,344
2010	2,809	1,047	1,601	2,776	88	62	8,382
2011	2,835	1,056	1,603	2,844	88	62	8,488
2012	2,861	1,065	1,594	2,840	88	62	8,510
2013	2,889	1,075	1,586	2,836	88	62	8,535

Annual Growth Rates (%)

1980-1990	-1.7	1.7	-4.9	6.6	-1.4	-2.1	-0.5
1990-2000	0.0	-0.4	2.9	3.4	4.8	0.1	1.6
2000-2003	-0.7	0.9	-3.2	2.2	-1.1	-3.4	-0.4
2003-2008	0.9	1.8	1.1	0.8	0.1	-0.7	1.0
2008-2013	1.0	0.9	-0.6	0.7	0.0	-0.1	0.5
2003-2013	0.9	1.4	0.2	0.8	0.1	-0.4	0.8

Excludes natural gas used for electric generation

Table E-3
Staff's Outlook for the SDG&E Area
End Use Natural Gas Consumption by Sector (10^6 Therms)

Year	Residential	Commercial	Industrial	Mining	Agricultural	Transportation, Communication & Utilities	Total Consumption
1980	312	91	40	1	11	14	468
1981	288	87	39	1	9	14	437
1982	318	86	47	2	4	18	475
1983	296	87	28	2	6	14	432
1984	283	83	17	2	6	19	411
1985	327	100	24	2	6	16	476
1986	295	83	30	2	5	15	429
1987	331	81	38	2	6	16	475
1988	337	102	35	3	7	18	501
1989	342	105	34	4	7	24	517
1990	338	124	28	4	6	17	517
1991	335	118	34	4	3	23	516
1992	314	117	33	3	7	22	495
1993	327	105	53	3	7	18	512
1994	344	119	50	2	7	17	539
1995	316	125	53	1	7	18	522
1996	317	130	54	0	8	20	528
1997	316	128	56	0	8	20	529
1998	356	132	58	1	9	24	579
1999	382	144	59	1	10	21	617
2000	340	144	54	1	9	19	567
2001	344	144	45	1	7	18	560
2002	345	146	40	1	10	18	561
2003	349	149	41	1	10	18	568
2004	353	152	43	1	10	18	578
2005	357	155	46	1	10	18	587
2006	361	158	48	1	10	19	596
2007	365	159	49	1	10	19	604
2008	370	161	50	1	10	19	611
2009	374	162	51	1	10	19	618
2010	378	164	52	1	10	19	625
2011	382	165	54	1	10	20	632
2012	385	167	55	1	10	20	638
2013	390	168	56	1	10	20	644

Annual Growth Rates (%)							
1980-1990	0.8	3.2	-3.6	14.4	-6.1	2.4	1.0
1990-2000	0.1	1.5	6.8	-16.1	5.1	1.0	0.9
2000-2003	0.8	1.0	-8.4	3.1	3.5	-1.1	0.8
2003-2008	1.2	1.6	4.1	0.8	0.1	0.7	1.5
2008-2013	1.1	0.9	1.9	1.2	0.0	0.8	1.1
2003-2013	1.1	1.2	3.0	1.0	0.1	0.8	1.3

Excludes natural gas used for electric generation

Table E-4
Staff's Outlook for the Other Area
End Use Natural Gas Consumption by Sector (10^6 Therms)

Year	Residential	Commercial	Industrial	Mining	Agricultural	Transportation, Communication & Utilities	Total Consumption
1980	46	20	3	0	2	6	78
1981	43	16	3	0	2	2	66
1982	40	13	2	0	1	2	59
1983	33	15	2	0	1	1	52
1984	47	19	2	0	2	2	72
1985	59	20	2	1	2	2	85
1986	50	19	2	0	2	2	76
1987	62	15	2	0	1	1	81
1988	63	18	3	0	0	1	86
1989	69	17	3	1	1	1	91
1990	72	17	3	1	1	1	95
1991	61	21	4	1	1	1	88
1992	67	20	4	1	1	3	94
1993	72	22	4	0	1	3	102
1994	75	21	4	3	1	4	109
1995	71	20	4	4	0	3	103
1996	70	20	15	4	0	3	113
1997	76	21	17	4	0	3	121
1998	91	24	14	3	0	3	134
1999	86	22	17	4	0	3	132
2000	75	20	17	4	0	2	119
2001	78	21	15	2	0	2	119
2002	78	21	15	3	0	2	120
2003	79	21	15	3	0	2	121
2004	80	21	16	3	0	3	122
2005	80	22	16	3	0	3	123
2006	81	22	16	3	0	3	124
2007	81	22	16	3	0	3	125
2008	82	22	16	3	0	3	125
2009	82	22	16	3	0	3	126
2010	83	22	15	3	0	3	127
2011	84	22	15	3	0	3	127
2012	84	22	15	3	0	3	127
2013	85	23	15	3	0	3	128

Annual Growth Rates (%)

1980-1990	4.6	-1.7	-0.4	5.4	-12.6	-15.7	2.0
1990-2000	0.4	1.8	18.4	20.0	-11.5	8.9	2.3
2000-2003	1.7	1.8	-4.5	-10.5	9.7	-0.7	0.7
2003-2008	0.7	0.7	0.7	1.8	0.0	2.3	0.8
2008-2013	0.7	0.4	-1.5	-1.3	0.0	3.6	0.4
2003-2013	0.7	0.6	-0.4	0.2	0.0	3.0	0.6

Excludes natural gas used for electric generation

Table E-5
Staff's Outlook for California
End Use Natural Gas Consumption by Sector (10^6 Therms)

	Residential	Commercial	Industrial	Mining	Agricultural	Transportation, Communication & Utilities	Total Consumption
1980	5,840	1,633	4,600	1,178	154	220	13,625
1981	5,195	1,560	4,480	1,079	147	224	12,685
1982	5,589	1,671	3,804	1,024	126	236	12,451
1983	5,169	1,585	2,780	846	108	208	10,696
1984	4,911	1,558	2,635	911	113	212	10,340
1985	5,493	1,705	3,062	1,027	118	219	11,624
1986	4,809	1,545	2,644	1,038	101	206	10,343
1987	5,167	1,649	2,834	1,083	111	215	11,058
1988	5,157	1,688	3,185	1,391	122	262	11,805
1989	5,385	1,806	3,094	1,638	131	230	12,283
1990	5,215	1,851	3,282	2,019	129	199	12,695
1991	5,270	1,732	2,909	2,159	116	219	12,405
1992	5,038	1,599	2,605	1,811	113	198	11,365
1993	5,145	1,621	2,982	1,700	99	180	11,726
1994	5,296	1,733	3,118	1,621	139	178	12,085
1995	4,812	1,591	3,206	2,127	120	160	12,015
1996	4,852	1,602	3,788	2,216	135	178	12,770
1997	4,811	1,658	3,629	2,974	148	190	13,410
1998	5,541	1,769	3,759	3,183	156	174	14,582
1999	5,760	1,987	3,580	2,883	190	170	14,569
2000	5,287	1,923	3,629	2,763	210	151	13,964
2001	5,099	1,751	3,466	2,986	144	163	13,609
2002	5,189	1,879	3,448	2,881	196	162	13,755
2003	5,228	1,909	3,512	2,933	197	162	13,940
2004	5,269	1,943	3,571	2,947	199	161	14,090
2005	5,310	1,975	3,687	2,989	200	161	14,322
2006	5,353	2,007	3,727	3,026	201	162	14,475
2007	5,402	2,022	3,699	3,017	202	162	14,503
2008	5,456	2,039	3,657	3,063	202	163	14,580
2009	5,509	2,054	3,566	3,098	202	163	14,593
2010	5,565	2,069	3,551	3,099	203	163	14,651
2011	5,614	2,084	3,542	3,175	203	164	14,783
2012	5,666	2,098	3,512	3,171	203	164	14,814
2013	5,718	2,113	3,487	3,166	203	164	14,852
Annual Growth Rates (%)							
1980-1990	-1.1	1.3	-3.3	5.5	-1.8	-1.0	-0.7
1990-2000	0.1	0.4	1.0	3.2	5.0	-2.7	1.0
2000-2003	-0.4	-0.2	-1.1	2.0	-2.1	2.3	-0.1
2003-2008	0.9	1.3	0.8	0.9	0.5	0.1	0.9
2008-2013	0.9	0.7	-0.9	0.7	0.1	0.2	0.4
2003-2013	0.9	1.0	-0.1	0.8	0.3	0.2	0.6

Excludes natural gas used for electric generation

Table E-6
Staff's Outlook for California
End Use Natural Gas Consumption by Utility (10^6 Therms)

	PG&E	SCG	SDG&E	OTHER	TOTAL
1980	5,911	7,168	468	78	13,625
1981	5,505	6,676	437	66	12,685
1982	5,341	6,577	475	59	12,451
1983	4,313	5,898	432	52	10,696
1984	4,258	5,599	411	72	10,340
1985	5,098	5,965	476	85	11,624
1986	4,238	5,600	429	76	10,343
1987	4,627	5,875	475	81	11,058
1988	4,731	6,487	501	86	11,805
1989	4,838	6,838	517	91	12,283
1990	5,278	6,806	517	95	12,695
1991	5,262	6,539	516	88	12,405
1992	4,447	6,329	495	94	11,365
1993	4,788	6,322	512	102	11,726
1994	5,047	6,390	539	109	12,085
1995	4,834	6,557	522	103	12,015
1996	4,955	7,174	528	113	12,770
1997	5,017	7,743	529	121	13,410
1998	5,453	8,416	579	134	14,582
1999	5,473	8,347	617	132	14,569
2000	5,339	7,939	567	119	13,964
2001	4,964	7,966	560	119	13,609
2002	5,283	7,792	561	120	13,755
2003	5,344	7,907	568	121	13,940
2004	5,395	7,996	578	122	14,090
2005	5,482	8,131	587	123	14,322
2006	5,523	8,232	596	124	14,475
2007	5,528	8,247	604	125	14,503
2008	5,531	8,312	611	125	14,580
2009	5,505	8,344	618	126	14,593
2010	5,517	8,382	625	127	14,651
2011	5,536	8,488	632	127	14,783
2012	5,539	8,510	638	127	14,814
2013	5,545	8,535	644	128	14,852

Annual Growth Rates (%)

1980-1990	-1.1	-0.5	1.0	2.0	-0.7
1990-2000	0.1	1.6	0.9	2.3	1.0
2000-2003	0.0	-0.1	0.1	0.5	-0.1
2003-2008	0.7	1.0	1.5	0.8	0.9
2008-2013	0.0	0.5	1.1	0.4	0.4
2003-2013	0.4	0.8	1.3	0.6	0.6

Excludes natural gas used for electric generation

Table E-7
Staff's High Demand Scenario for California
Natural Gas Consumption by Utiltity (10^6 Therms)

Year	PG&E	SCG	SDG&E	OTHER	TOTAL
2001	4,964	7,966	560	119	13,609
2002	5,283	7,792	561	120	13,755
2003	5,344	7,907	568	121	13,940
2004	5,445	8,074	581	122	14,222
2005	5,560	8,235	592	124	14,511
2006	5,646	8,376	603	125	14,750
2007	5,671	8,453	614	126	14,863
2008	5,669	8,540	621	126	14,957
2009	5,630	8,529	628	127	14,914
2010	5,641	8,561	635	128	14,964
2011	5,654	8,595	641	128	15,017
2012	5,657	8,616	647	128	15,048
2013	5,664	8,642	654	129	15,089

Annual Growth Rates (%)					
2001-2006	2.6	1.0	1.5	0.9	1.6
2006-2013	0.0	0.4	1.2	0.4	0.3
2003-2013	0.6	0.9	1.4	0.6	0.8

Table E-8
Staff's Low Demand Scenario for California
Natural Gas Consumption by Utiltity (10^6 Therms)

Year	PG&E	SCG	SDG&E	OTHER	TOTAL
2001	4,964	7,966	560	119	13,609
2002	5,283	7,792	561	120	13,755
2003	5,344	7,907	568	121	13,940
2004	5,378	7,981	575	122	14,056
2005	5,427	8,049	582	123	14,181
2006	5,447	8,096	588	123	14,255
2007	5,419	8,096	594	124	14,232
2008	5,424	8,150	602	124	14,300
2009	5,414	8,151	609	125	14,300
2010	5,438	8,231	616	125	14,410
2011	5,465	8,307	622	126	14,519
2012	5,470	8,333	628	126	14,556
2013	5,484	8,431	635	127	14,677

Annual Growth Rates (%)					
2001-2006	1.9	0.3	1.0	0.7	0.9
2006-2013	0.1	0.6	1.1	0.4	0.4
2003-2013	0.3	0.6	1.1	0.5	0.5

Table F-1
Statewide Economic and Demographic Inputs

YEAR	GDP Implicit Price Deflator Index (2001=100)	Population (000s)	GSP (Millions 2001$)	Total Nonagricultural Employment (1,000s)	Real Personal Income (Millions 2001$)	Industrial Shipments (Millions 2001$)
1980	52	23,782		6,910	558,759	
1981	57	24,278		7,166	559,464	
1982	61	24,805		7,254	563,212	
1983	63	25,336		7,627	587,688	
1984	65	25,816		7,824	630,856	
1985	67	26,402		7,840	654,510	
1986	69	27,052	834	8,147	673,743	
1987	71	27,717	890	8,592	698,791	
1988	73	28,393	944	9,191	724,854	
1989	76	29,146	988	9,656	747,003	
1990	79	29,829	1,019	9,841	769,158	390,422
1991	82	30,458	1,003	9,978	759,148	384,786
1992	84	30,987	995	9,812	770,510	376,007
1993	86	31,314	987	9,917	765,944	365,416
1994	88	31,523	1,001	10,390	781,464	376,212
1995	90	31,711	1,035	10,770	812,076	399,259
1996	91	31,962	1,069	11,085	846,748	433,302
1997	93	32,452	1,131	11,471	884,825	465,256
1998	94	32,862	1,205	11,910	939,899	521,398
1999	96	33,417	1,302	12,237	981,550	581,264
2000	98	34,043	1,408	12,499	1,044,633	656,764
2001	100	34,711	1,420	12,359	1,029,623	613,108
2002	101	35,302	1,418	12,153	1,015,520	534,999
2003	103	35,893	1,452	12,045	1,033,154	549,062
2004	107	36,485	1,490	12,159	1,061,646	564,944
2005	110	37,076	1,529	12,421	1,099,412	588,868
2006	114	37,627	1,570	12,743	1,145,268	605,338
2007	117	38,178	1,609	13,129	1,187,694	618,106
2008	119	38,729	1,660	13,595	1,250,636	638,690
2009	121	39,280	1,713	13,991	1,291,456	658,798
2010	124	39,830	1,770	14,487	1,335,293	672,148
2011	126	40,314	1,827	14,697	1,370,640	687,037
2012	129	40,798	1,877	14,675	1,405,564	702,466
2013	131	41,281	1,927	14,896	1,439,505	717,645

Annual Growth Rates (%)

1980-1990	4.3	2.3		3.6	3.2	
1990-2000	2.1	1.3	3.3	2.4	3.1	5.3
2000-2001	2.2	2.0	0.8	-1.1	-1.4	-6.6
2000-2003	1.6	1.8	1.0	-1.2	-0.4	-5.8
2003-2008	3.0	1.5	2.7	2.5	3.9	3.1
2008-2013	2.0	1.3	3.0	1.8	2.9	2.4
2003-2013	2.5	1.4	2.9	2.1	3.4	2.7

Table F-2
Statewide Economic and Demographic Inputs by Demand Scenario

	Statewide Industrial Shipments (Millions 2001$) (excludes SIC 15)			Statewide Nonfarm Employment (1000s Jobs)			Real Personal Income - (Billions 2001$)		
	Baseline	Low Growth	High Growth	Baseline	Low Growth	High Growth	Baseline	Low Growth	High Growth
2003	446,089	446,089	446,089	14,896	14,896	14895.56	1,117	1,113	1,117
2004	455,805	451,478	473,445	15,247	15,069	15449.85	1,148	1,138	1,176
2005	469,773	457,920	501,876	15,591	15,243	16004.14	1,188	1,170	1,232
2006	477,284	463,460	529,411	15,988	15,417	16558.43	1,239	1,195	1,286
2007	494,754	467,231	554,493	16,404	15,591	17112.72	1,285	1,221	1,354
2008	515,926	473,094	571,979	16,753	15,988	17461.42	1,354	1,248	1,399
2009	535,695	489,981	585,426	17,113	16,404	17861.49	1,399	1,282	1,448
2010	548,810	511,926	600,210	17,461	16,753	18151.56	1,448	1,316	1,487
2011	567,227	533,669	615,899	17,861	17,113	18421.28	1,487	1,356	1,526
2012	582,360	546,602	632,042	18,152	17,461	18677.52	1,526	1,396	1,564
2013	597,057	564,800	649,146	18,421	17,861	18954.88	1,564	1,436	1,603
Annual Growth Rates (%)									
2003-2	3.0	1.2	5.1	2.4	1.4	3.2	3.9	2.3	4.6
2008-2	3.0	3.6	2.6	1.9	2.2	1.7	2.9	2.8	2.8
2003-2	3.0	2.4	3.8	2.1	1.8	2.4	3.4	2.6	3.7

Table F-3
Residential Forecast Demographic Inputs by Planning Area

PG&E

Year	Household Population	Single Family Homes	Multi-family Homes	Mobile Homes	Total Homes	Persons per Household	Per Capita Income (77$)
1980	8,584,530	2,146,878	927,033	196,666	3,270,576	2.63	10,665
1981	8,680,387	2,170,254	932,730	203,660	3,306,643	2.63	10,446
1982	8,795,961	2,191,026	938,844	208,829	3,338,699	2.64	10,355
1983	9,047,698	2,228,619	956,431	215,107	3,400,158	2.66	10,647
1984	9,283,228	2,265,948	981,331	221,779	3,469,059	2.68	11,236
1985	9,511,282	2,305,583	1,016,716	229,449	3,551,748	2.68	11,355
1986	9,718,568	2,353,407	1,045,299	236,454	3,635,160	2.67	11,402
1987	9,876,854	2,399,186	1,064,840	242,191	3,706,217	2.67	11,525
1988	10,047,184	2,451,589	1,074,788	248,193	3,774,571	2.66	11,766
1989	10,273,788	2,508,568	1,085,969	254,175	3,848,713	2.67	11,885
1990	10,450,149	2,549,154	1,092,694	255,572	3,897,420	2.68	12,003
1991	10,678,289	2,597,240	1,110,088	254,572	3,961,901	2.70	11,729
1992	10,874,633	2,638,295	1,119,867	253,577	4,011,739	2.71	11,809
1993	11,037,587	2,675,520	1,127,027	252,585	4,055,133	2.72	11,694
1994	11,125,465	2,710,352	1,133,753	251,598	4,095,704	2.72	11,922
1995	11,221,850	2,744,153	1,140,706	250,615	4,135,475	2.71	12,412
1996	11,331,594	2,776,430	1,147,668	249,637	4,173,735	2.72	12,932
1997	11,538,647	2,809,493	1,158,404	248,717	4,216,613	2.74	13,373
1998	11,685,349	2,844,388	1,173,193	247,800	4,265,381	2.74	14,045
1999	11,860,298	2,885,520	1,187,239	246,888	4,319,647	2.75	14,705
2000	12,069,552	2,922,124	1,202,580	245,979	4,370,683	2.76	15,557
2001	12,285,241	2,957,928	1,219,095	245,074	4,422,096	2.78	15,112
2002	12,519,186	3,008,719	1,233,314	250,198	4,492,231	2.79	14,300
2003	12,752,081	3,059,366	1,246,997	255,276	4,561,639	2.80	14,592
2004	12,984,878	3,108,751	1,259,816	260,200	4,628,767	2.81	15,100
2005	13,217,557	3,155,235	1,270,526	264,771	4,690,532	2.82	15,595
2006	13,427,236	3,199,491	1,280,038	269,075	4,748,605	2.83	16,079
2007	13,636,777	3,247,038	1,291,296	273,746	4,812,079	2.83	16,398
2008	13,846,171	3,295,371	1,302,672	278,483	4,876,526	2.84	16,845
2009	14,055,405	3,343,951	1,314,033	283,233	4,941,218	2.85	17,123
2010	14,264,508	3,392,814	1,325,334	287,996	5,006,144	2.85	17,432
2011	14,436,378	3,434,586	1,333,035	291,963	5,059,584	2.85	17,735
2012	14,608,042	3,476,640	1,340,744	295,949	5,113,333	2.86	17,970
2013	14,779,481	3,519,345	1,348,607	299,991	5,167,944	2.86	18,184

Annual Growth Rates (%)

1980-1990	2.0	1.7	1.7	2.7	1.8	0.2	1.2
1990-2000	1.5	1.4	1.0	-0.4	1.2	0.3	2.6
2000-2003	1.9	1.5	1.2	1.2	1.4	0.4	-2.1
2003-2008	1.7	1.5	0.9	1.8	1.3	0.3	2.9
2008-2013	1.3	1.3	0.7	1.5	1.2	0.1	1.5
2003-2013	1.5	1.4	0.8	1.6	1.3	0.2	2.2

Table F-3
Residential Forecast Demographic Inputs by Planning Area

SMUD

Year	Household Population	Single Family Homes	Multi-family Homes	Mobile Homes	Total Homes	Persons per Household	Per Capita Income (77$)
1980	777,292	202,659	86,342	14,165	303,167	2.56	9,379
1981	780,352	205,428	86,295	14,724	306,447	2.55	9,003
1982	792,949	208,393	86,267	14,951	309,611	2.56	8,832
1983	825,773	214,416	87,495	15,418	317,329	2.60	9,015
1984	854,929	220,040	91,785	15,708	327,533	2.61	9,572
1985	895,717	227,802	101,544	15,863	345,209	2.60	10,014
1986	915,570	235,466	103,893	16,013	355,372	2.58	10,198
1987	931,931	241,647	106,363	16,129	364,140	2.56	10,280
1988	959,538	249,856	108,011	16,800	374,667	2.56	10,341
1989	992,208	260,622	109,042	17,388	387,052	2.56	10,589
1990	1,018,434	269,090	109,565	17,480	396,134	2.57	10,751
1991	1,051,318	279,603	110,844	17,439	407,886	2.58	10,467
1992	1,068,645	285,797	111,890	17,398	415,085	2.58	10,472
1993	1,083,912	291,420	112,376	17,357	421,153	2.57	10,255
1994	1,090,145	296,912	112,854	17,316	427,082	2.55	10,613
1995	1,095,153	302,462	113,151	17,275	432,887	2.53	11,061
1996	1,109,748	307,465	113,311	17,234	438,011	2.53	11,102
1997	1,123,820	309,426	113,585	17,178	440,189	2.55	11,430
1998	1,140,219	311,594	114,300	17,121	443,015	2.57	11,887
1999	1,179,071	316,456	116,069	17,065	449,589	2.62	11,927
2000	1,206,273	321,806	117,197	17,009	456,011	2.65	12,326
2001	1,238,624	328,058	118,711	16,953	463,722	2.67	11,821
2002	1,263,854	334,261	119,876	17,513	471,651	2.68	11,121
2003	1,289,085	340,522	121,054	18,079	479,654	2.69	11,290
2004	1,314,315	346,639	122,198	18,631	487,468	2.70	11,647
2005	1,339,546	352,529	123,293	19,162	494,984	2.71	11,928
2006	1,363,081	358,158	124,329	19,670	502,157	2.71	12,320
2007	1,386,617	364,068	125,427	20,203	509,698	2.72	12,536
2008	1,410,152	370,045	126,540	20,740	517,326	2.73	12,859
2009	1,433,687	376,082	127,665	21,283	525,029	2.73	13,063
2010	1,457,223	382,153	128,797	21,828	532,778	2.74	13,315
2011	1,478,085	387,642	129,801	22,321	539,764	2.74	13,560
2012	1,498,948	393,158	130,810	22,816	546,784	2.74	13,768
2013	1,519,811	398,750	131,835	23,318	553,903	2.74	13,980

Annual Growth Rates (%)

1980-1990	2.7	2.9	2.4	2.1	2.7	0.0	1.4
1990-2000	1.7	1.8	0.7	-0.3	1.4	0.3	1.4
2000-2003	2.2	1.9	1.1	2.1	1.7	0.5	-2.9
2003-2008	1.8	1.7	0.9	2.8	1.5	0.3	2.6
2008-2013	1.5	1.5	0.8	2.4	1.4	0.1	1.7
2003-2013	1.7	1.6	0.9	2.6	1.4	0.2	2.2

Table F-3
Residential Forecast Demographic Inputs by Planning Area

SCE

Year	Household Population	Single Family Homes	Multi-family Homes	Mobile Homes	Total Homes	Persons per Household	Per Capita Income (77$)
1980	8,411,169	1,991,622	821,533	177,284	2,990,439	2.81	10,233
1981	8,494,336	2,011,806	829,332	181,251	3,022,389	2.81	10,078
1982	8,630,444	2,026,070	831,607	185,078	3,042,755	2.84	9,888
1983	8,905,228	2,062,768	844,779	189,258	3,096,805	2.88	10,062
1984	9,171,726	2,106,729	871,307	194,828	3,172,864	2.89	10,581
1985	9,462,927	2,149,377	911,061	200,029	3,260,467	2.90	10,773
1986	9,821,899	2,209,637	960,660	203,829	3,374,126	2.91	10,862
1987	10,114,279	2,262,989	990,557	205,863	3,459,410	2.92	11,063
1988	10,429,728	2,332,121	1,013,044	212,902	3,558,068	2.93	11,199
1989	10,709,887	2,398,105	1,027,374	216,862	3,642,342	2.94	11,245
1990	10,869,185	2,430,809	1,036,098	216,838	3,683,745	2.95	11,357
1991	11,117,050	2,474,023	1,055,784	216,095	3,745,902	2.97	10,888
1992	11,333,016	2,507,504	1,064,467	215,355	3,787,326	2.99	10,781
1993	11,439,024	2,538,996	1,068,495	214,617	3,822,108	2.99	10,531
1994	11,543,713	2,565,070	1,075,274	213,882	3,854,226	3.00	10,619
1995	11,628,352	2,592,331	1,080,057	213,150	3,885,538	2.99	10,876
1996	11,718,087	2,618,109	1,085,695	212,420	3,916,223	2.99	11,159
1997	11,883,259	2,642,259	1,091,683	211,477	3,945,419	3.01	11,439
1998	12,022,582	2,668,414	1,098,043	210,538	3,976,995	3.02	11,972
1999	12,234,124	2,695,922	1,106,688	209,602	4,012,213	3.05	12,113
2000	12,476,975	2,721,008	1,116,526	208,670	4,046,204	3.08	12,723
2001	12,733,623	2,747,873	1,124,907	207,742	4,080,522	3.12	12,320
2002	12,944,718	2,785,282	1,136,718	211,657	4,133,657	3.13	11,691
2003	13,162,491	2,825,700	1,149,906	215,866	4,191,472	3.14	11,955
2004	13,379,774	2,864,728	1,162,354	219,921	4,247,003	3.15	12,417
2005	13,596,559	2,898,958	1,171,936	223,447	4,294,341	3.17	12,866
2006	13,808,752	2,935,127	1,182,279	227,163	4,344,569	3.18	13,326
2007	14,020,450	2,976,743	1,195,561	231,459	4,403,763	3.18	13,599
2008	14,231,644	3,019,522	1,209,310	235,871	4,464,703	3.19	13,979
2009	14,442,323	3,063,273	1,223,343	240,375	4,526,992	3.19	14,215
2010	14,655,954	3,108,607	1,238,105	245,010	4,591,722	3.19	14,479
2011	14,850,355	3,149,672	1,250,296	249,170	4,649,138	3.19	14,709
2012	15,044,289	3,191,541	1,262,833	253,409	4,707,783	3.20	14,881
2013	15,237,745	3,234,824	1,275,973	257,791	4,768,588	3.20	15,039

Annual Growth Rates (%)

1980-1990	2.6	2.0	2.3	2.0	2.1	0.5	1.0
1990-2000	1.4	1.1	0.8	-0.4	0.9	0.4	1.1
2000-2003	1.8	1.3	1.0	1.1	1.2	0.6	-2.1
2003-2008	1.6	1.3	1.0	1.8	1.3	0.3	3.2
2008-2013	1.4	1.4	1.1	1.8	1.3	0.0	1.5
2003-2013	1.5	1.4	1.0	1.8	1.3	0.2	2.3

Table F-3
Residential Forecast Demographic Inputs by Planning Area

LADWP

Year	Household Population	Single Family Homes	Multi-family Homes	Mobile Homes	Total Homes	Persons per Household	Per Capita Income (77$)
1980	2,910,607	564,463	576,619	0	1,141,082	2.55	10,378
1981	2,906,001	563,529	580,557	0	1,144,086	2.54	10,234
1982	2,946,350	562,365	580,798	0	1,143,163	2.58	10,035
1983	3,007,633	561,685	585,945	0	1,147,630	2.62	10,203
1984	3,054,757	562,010	595,374	0	1,157,384	2.64	10,688
1985	3,144,279	562,342	614,014	0	1,176,356	2.67	10,849
1986	3,234,166	563,178	631,665	0	1,194,843	2.71	10,908
1987	3,290,344	564,196	643,697	0	1,207,894	2.72	11,131
1988	3,350,965	565,410	652,205	0	1,217,615	2.75	11,253
1989	3,411,436	567,625	656,614	0	1,224,239	2.79	11,270
1990	3,427,208	567,438	656,823	0	1,224,261	2.80	11,540
1991	3,462,418	568,173	668,543	0	1,236,716	2.80	11,081
1992	3,497,960	568,558	676,945	0	1,245,502	2.81	10,975
1993	3,507,744	567,487	683,458	0	1,250,945	2.80	10,748
1994	3,490,169	570,418	684,561	0	1,254,979	2.78	10,800
1995	3,474,020	573,285	685,121	0	1,258,407	2.76	11,131
1996	3,479,584	576,141	685,761	0	1,261,903	2.76	11,469
1997	3,500,821	579,689	686,594	0	1,266,283	2.77	11,700
1998	3,534,564	582,989	688,280	0	1,271,269	2.78	12,301
1999	3,581,520	585,749	690,588	0	1,276,337	2.81	12,389
2000	3,635,849	587,246	692,156	0	1,279,402	2.84	12,814
2001	3,699,696	588,926	694,213	0	1,283,140	2.88	12,407
2002	3,722,136	590,882	698,088	0	1,288,971	2.89	11,831
2003	3,744,718	592,857	701,974	0	1,294,830	2.89	12,201
2004	3,767,443	594,848	705,871	0	1,300,719	2.90	12,773
2005	3,790,308	596,859	709,782	0	1,306,641	2.90	13,317
2006	3,813,315	598,885	713,705	0	1,312,590	2.91	13,834
2007	3,836,465	600,927	717,640	0	1,318,566	2.91	14,129
2008	3,859,760	602,986	721,586	0	1,324,572	2.91	14,533
2009	3,883,202	605,064	725,545	0	1,330,609	2.92	14,787
2010	3,906,787	607,157	729,516	0	1,336,673	2.92	15,066
2011	3,930,522	609,264	733,501	0	1,342,765	2.93	15,308
2012	3,954,404	611,387	737,498	0	1,348,885	2.93	15,486
2013	3,978,434	613,528	741,509	0	1,355,036	2.94	15,648
Annual Growth Rates (%)							
1980-1990	1.6	0.1	1.3		0.7	0.9	1.1
1990-2000	0.6	0.3	0.5		0.4	0.2	1.1
2000-2003	1.0	0.3	0.5		0.4	0.6	-1.6
2003-2008	0.6	0.3	0.6		0.5	0.2	3.6
2008-2013	0.6	0.3	0.5		0.5	0.2	1.5
2003-2013	0.6	0.3	0.5		0.5	0.2	2.5

Table F-3
Residential Forecast Demographic Inputs by Planning Area

SDG&E

Year	Household Population	Single Family Homes	Multi-family Homes	Mobile Homes	Total Homes	Persons per Household	Per Capita Income (77$)
1980	1,890,510	437,909	234,013	46,391	718,312	2.63	9,680
1981	1,913,432	443,191	235,905	46,806	725,903	2.64	9,630
1982	1,948,429	448,271	236,703	47,436	732,411	2.66	9,595
1983	2,033,614	461,176	242,903	48,045	752,124	2.70	9,845
1984	2,136,849	475,610	258,571	48,899	783,080	2.73	10,519
1985	2,235,849	490,876	277,898	50,420	819,194	2.73	10,832
1986	2,323,872	510,061	299,128	51,380	860,569	2.70	10,967
1987	2,388,259	528,118	309,313	52,841	890,272	2.68	11,104
1988	2,442,254	545,556	317,607	53,262	916,425	2.67	11,290
1989	2,495,064	558,817	320,491	54,086	933,395	2.67	11,392
1990	2,549,875	567,208	324,373	54,503	946,084	2.70	11,234
1991	2,604,755	579,522	330,139	54,382	964,042	2.70	10,977
1992	2,653,616	588,157	335,173	54,261	977,591	2.71	10,949
1993	2,670,770	596,402	337,933	54,140	988,476	2.70	10,839
1994	2,688,862	604,500	340,239	54,020	998,758	2.69	11,016
1995	2,699,011	612,160	342,906	53,900	1,008,967	2.68	11,333
1996	2,714,332	621,298	344,183	53,781	1,019,262	2.66	11,832
1997	2,780,840	630,679	348,009	53,743	1,032,431	2.69	12,221
1998	2,842,514	641,900	352,089	53,706	1,047,694	2.71	12,890
1999	2,908,551	652,564	358,696	53,668	1,064,929	2.73	13,330
2000	2,979,110	661,707	365,061	53,630	1,080,399	2.76	13,425
2001	3,051,090	670,763	370,789	53,593	1,095,144	2.79	13,020
2002	3,123,124	685,118	378,546	55,059	1,118,723	2.79	12,389
2003	3,190,177	697,067	384,998	56,313	1,138,378	2.80	12,611
2004	3,257,367	708,035	390,897	57,459	1,156,391	2.82	13,039
2005	3,324,697	718,403	396,448	58,539	1,173,390	2.83	13,459
2006	3,380,449	728,847	402,029	59,626	1,190,502	2.84	13,919
2007	3,436,312	739,588	407,788	60,746	1,208,122	2.84	14,261
2008	3,492,287	749,747	413,223	61,801	1,224,771	2.85	14,718
2009	3,548,371	759,372	418,360	62,798	1,240,530	2.86	15,030
2010	3,601,092	767,792	422,842	63,693	1,254,327	2.87	15,368
2011	3,645,744	774,805	426,507	64,433	1,265,745	2.88	15,695
2012	3,690,424	782,337	430,462	65,229	1,278,028	2.89	15,961
2013	3,735,131	790,627	434,841	66,108	1,291,576	2.89	16,211

Annual Growth Rates (%)

1980-1990	3.0	2.6	3.3	1.6	2.8	0.2	1.5
1990-2000	1.6	1.6	1.2	-0.2	1.3	0.2	1.8
2000-2003	2.3	1.8	1.8	1.6	1.8	0.5	-2.1
2003-2008	1.8	1.5	1.4	1.9	1.5	0.3	3.1
2008-2013	1.4	1.1	1.0	1.4	1.1	0.3	2.0
2003-2013	1.6	1.3	1.2	1.6	1.3	0.3	2.5

Table F-3
Residential Forecast Demographic Inputs by Planning Area

OTHER

Year	Household Population	Single Family Homes	Multi-family Homes	Mobile Homes	Total Homes	Persons per Household	Per Capita Income (77$)
1980	279,043	71,297	14,400	13,682	99,379	2.81	8,701
1981	283,516	72,235	14,779	14,426	101,440	2.80	8,119
1982	287,332	72,892	14,971	14,997	102,860	2.79	8,003
1983	295,607	74,238	15,160	15,767	105,164	2.81	8,215
1984	303,749	75,722	15,756	16,725	108,203	2.81	8,478
1985	311,142	76,774	16,619	17,456	110,849	2.81	8,456
1986	319,997	78,405	17,500	18,233	114,138	2.80	8,540
1987	328,089	80,076	18,045	18,938	117,059	2.80	8,805
1988	341,569	82,979	18,535	20,074	121,588	2.81	9,058
1989	350,714	85,267	18,997	21,023	125,287	2.80	9,176
1990	359,986	86,818	19,585	21,089	127,492	2.82	9,108
1991	373,724	89,833	20,193	20,936	130,962	2.85	8,736
1992	384,251	92,447	20,360	20,784	133,591	2.88	8,597
1993	392,782	94,546	20,455	20,633	135,633	2.90	8,623
1994	395,920	96,370	20,708	20,482	137,560	2.88	8,703
1995	398,714	97,979	21,014	20,333	139,325	2.86	8,857
1996	402,487	99,361	21,105	20,184	140,649	2.86	8,896
1997	409,111	101,038	21,336	20,131	142,505	2.87	9,199
1998	411,463	102,791	21,703	20,079	144,573	2.85	9,723
1999	417,835	104,887	21,976	20,027	146,889	2.85	9,924
2000	426,820	106,763	22,302	19,975	149,040	2.86	10,538
2001	439,440	108,896	22,764	19,923	151,584	2.90	10,076
2002	454,919	112,288	23,418	20,324	156,031	2.92	9,407
2003	469,257	115,515	24,016	20,679	160,210	2.93	9,488
2004	483,528	118,650	24,595	21,023	164,268	2.94	9,723
2005	497,735	121,648	25,145	21,351	168,144	2.96	9,963
2006	511,817	124,602	25,693	21,676	171,971	2.98	10,224
2007	525,840	127,689	26,273	22,018	175,979	2.99	10,379
2008	539,807	130,824	26,861	22,366	180,051	3.00	10,613
2009	553,715	133,984	27,458	22,719	184,162	3.01	10,736
2010	567,496	137,133	28,056	23,071	188,260	3.01	10,888
2011	580,502	140,030	28,606	23,391	192,027	3.02	11,011
2012	593,458	142,932	29,158	23,713	195,803	3.03	11,088
2013	606,361	145,867	29,720	24,039	199,626	3.04	11,157

Annual Growth Rates (%)

1980-1990	2.6	2.0	3.1	4.4	2.5	0.1	0.5
1990-2000	1.7	2.1	1.3	-0.5	1.6	0.1	1.5
2000-2003	3.2	2.7	2.5	1.2	2.4	0.8	-3.4
2003-2008	2.8	2.5	2.3	1.6	2.4	0.5	2.3
2008-2013	2.4	2.2	2.0	1.5	2.1	0.3	1.0
2003-2013	2.6	2.4	2.2	1.5	2.2	0.4	1.6

Table F-3
Residential Forecast Demographic Inputs by Planning Area

BGP

Year	Household Population	Single Family Homes	Multi-family Homes	Mobile Homes	Total Homes	Persons per Household	Per Capita Income (77$)
1980	330,752	75,767	64,773	337	140,877	2.35	10,381
1981	334,508	75,856	66,409	322	142,586	2.35	10,237
1982	341,963	75,891	67,315	300	143,506	2.38	10,039
1983	351,542	75,943	68,894	278	145,115	2.42	10,207
1984	359,077	76,033	71,560	256	147,850	2.43	10,693
1985	367,021	76,115	73,860	235	150,210	2.44	10,854
1986	374,085	76,197	76,185	214	152,596	2.45	10,914
1987	380,914	76,289	77,991	193	154,473	2.47	11,137
1988	386,985	76,390	79,577	172	156,139	2.48	11,258
1989	395,487	76,553	80,886	165	157,603	2.51	11,274
1990	397,991	76,555	81,890	142	158,587	2.51	11,545
1991	401,092	77,308	82,806	142	160,257	2.50	11,085
1992	404,632	78,026	83,139	142	161,307	2.51	10,979
1993	407,649	78,599	83,330	141	162,070	2.52	10,751
1994	409,348	79,180	83,497	141	162,818	2.51	10,804
1995	409,647	79,763	83,578	140	163,481	2.51	11,135
1996	409,976	80,208	83,595	140	163,943	2.50	11,473
1997	411,145	80,435	83,717	140	164,292	2.50	11,704
1998	413,794	80,630	83,856	140	164,626	2.51	12,305
1999	418,193	80,846	84,039	140	165,025	2.53	12,393
2000	423,649	80,960	84,162	139	165,261	2.56	12,817
2001	430,768	82,076	85,467	138	167,681	2.57	12,410
2002	433,407	82,375	85,747	227	168,350	2.57	11,834
2003	436,065	82,677	86,030	317	169,023	2.58	12,205
2004	438,742	82,980	86,314	406	169,699	2.59	12,778
2005	441,438	83,285	86,600	495	170,380	2.59	13,323
2006	444,153	83,591	86,888	584	171,063	2.60	13,840
2007	446,887	83,899	87,178	673	171,751	2.60	14,135
2008	449,641	84,209	87,470	762	172,442	2.61	14,539
2009	452,415	84,521	87,764	852	173,137	2.61	14,794
2010	455,207	84,835	88,060	941	173,836	2.62	15,073
2011	458,020	85,151	88,358	1,030	174,539	2.62	15,314
2012	460,853	85,468	88,658	1,119	175,245	2.63	15,492
2013	463,706	85,787	88,960	1,208	175,956	2.64	15,655

Annual Growth Rates (%)

1980-1990	1.9	0.1	2.4	-8.3	1.2	0.7	1.1
1990-2000	0.6	0.6	0.3	-0.2	0.4	0.2	1.1
2000-2003	1.0	0.7	0.7	31.6	0.8	0.2	-1.6
2003-2008	0.6	0.4	0.3	19.2	0.4	0.2	3.6
2008-2013	0.6	0.4	0.3	9.7	0.4	0.2	1.5
2003-2013	0.6	0.4	0.3	14.3	0.4	0.2	2.5

Table F-4
Commercial Forecast Drivers by Planning Area

PG&E

	Thousands of Persons						Millions of 2001 $				
Year	Population 0-17	Population 65+	Total Emp.	Retail Emp.	Office Emp.	Wholesale Emp.	Personal Income	Restaurant Sales	Retail Sales	Food Sales	Total Sales
1980	1,706	936	3,566	625	1,728	199.76	226,525	9,322	76,880	6,562	117,261
1981	1,706	950	3,612	634	1,761	200.47	225,924	9,348	74,170	7,037	114,147
1982	1,699	971	3,578	628	1,759	194.75	227,997	9,315	71,120	7,033	108,651
1983	1,701	994	3,620	649	1,781	198.90	239,256	9,966	78,162	7,390	118,226
1984	1,707	1,015	3,793	686	1,854	210.10	256,906	10,496	83,274	7,576	129,083
1985	1,735	1,042	3,900	711	1,924	217.96	265,220	10,696	84,105	7,713	130,001
1986	1,767	1,072	3,964	734	1,974	220.80	271,141	10,777	83,812	7,606	129,669
1987	1,793	1,101	4,088	763	2,050	221.39	279,025	11,055	85,738	7,339	131,435
1988	1,823	1,133	4,246	800	2,121	243.23	290,555	11,293	88,467	7,298	137,727
1989	1,852	1,166	4,356	807	2,187	256.12	300,317	11,342	91,023	7,569	141,738
1990	1,929	1,217	4,466	819	2,268	259.66	309,571	11,350	90,920	7,495	141,877
1991	1,979	1,244	4,486	820	2,296	256.55	308,763	11,166	86,420	7,273	133,602
1992	2,028	1,270	4,471	810	2,326	248.21	316,785	10,936	85,668	7,139	132,708
1993	2,078	1,296	4,476	813	2,344	244.04	318,414	10,857	84,121	7,012	129,074
1994	2,127	1,322	4,521	831	2,378	242.27	327,066	10,982	85,175	6,713	131,767
1995	2,177	1,348	4,632	848	2,447	251.31	343,090	11,298	87,334	6,612	137,872
1996	2,226	1,375	4,797	873	2,525	264.39	361,164	11,706	90,703	6,794	144,763
1997	2,275	1,401	4,962	895	2,605	277.63	380,262	12,122	94,189	6,963	151,876
1998	2,325	1,427	5,136	912	2,714	285.66	404,215	12,513	97,466	6,924	155,965
1999	2,374	1,453	5,280	938	2,806	290.69	429,214	13,126	106,336	7,271	168,664
2000	2,424	1,479	5,507	976	2,956	293.86	462,122	14,009	117,268	7,647	186,841
2001	2,451	1,515	5,591	994	3,020	290.75	455,384	13,818	111,698	7,437	175,692
2002	2,479	1,551	5,576	1,011	3,042	291.92	448,726	13,685	109,441	7,289	175,140
2003	2,507	1,587	5,651	1,025	3,089	294.95	456,255	13,842	110,722	7,377	177,273
2004	2,534	1,622	5,767	1,044	3,164	296.98	468,338	14,091	112,737	7,515	180,639
2005	2,562	1,658	5,882	1,073	3,244	307.24	484,817	14,425	115,491	7,703	185,238
2006	2,590	1,694	6,020	1,097	3,325	315.28	504,386	14,812	118,660	7,917	190,591
2007	2,618	1,730	6,181	1,118	3,438	320.23	523,430	15,201	121,831	8,133	195,899
2008	2,645	1,766	6,315	1,140	3,532	325.41	551,583	15,776	126,493	8,447	203,744
2009	2,673	1,801	6,453	1,164	3,630	332.15	570,043	16,157	129,561	8,653	208,895
2010	2,701	1,837	6,593	1,185	3,728	342.19	589,848	16,559	132,842	8,876	214,403
2011	2,731	1,910	6,746	1,206	3,835	348.77	606,029	16,893	135,531	9,056	218,916
2012	2,760	1,982	6,859	1,225	3,917	355.92	621,990	17,215	138,175	9,234	223,363
2013	2,790	2,054	6,965	1,241	3,991	363.56	637,435	17,525	140,724	9,407	227,652

Annual Growth Rates (%)											
1980-1990	1.2	2.7	2.3	2.7	2.8	2.7	3.2	2.0	1.7	1.3	1.9
1990-2000	2.3	2.0	2.1	1.8	2.7	1.2	4.1	2.1	2.6	0.2	2.8
2000-2003	1.1	2.4	0.9	1.6	1.5	0.1	-0.4	-0.4	-1.9	-1.2	-1.7
2003-2008	1.1	2.2	2.2	2.2	2.7	2.0	3.9	2.7	2.7	2.7	2.8
2008-2013	1.1	3.1	2.0	1.7	2.5	2.2	2.9	2.1	2.2	2.2	2.2
2003-2013	1.1	2.6	2.1	1.9	2.6	2.1	3.4	2.4	2.4	2.5	2.5

Table F-4
Commercial Forecast Drivers by Planning Area

SMUD

	Thousands of Persons						Millions of 2001 $				
Year	Population 0-17	Population 65+	Total Emp.	Retail Emp.	Office Emp.	Wholesale Emp.	Personal Income	Restaurant Sales	Retail Sales	Food Sales	Total Sales
1980	153	74	323	58	195	13.87	17,755	808	6,865	721	9,971
1981	154	76	330	59	201	14.87	17,467	805	6,669	737	9,600
1982	156	78	331	59	204	14.89	17,694	822	6,633	729	9,331
1983	157	81	338	62	208	15.90	18,527	874	7,368	750	10,461
1984	158	83	355	66	215	17.90	20,080	909	7,913	767	11,497
1985	162	86	378	71	229	18.91	21,533	942	8,363	802	12,257
1986	167	90	399	74	240	18.93	22,629	985	8,570	824	12,709
1987	173	95	418	79	251	19.94	23,656	1,015	8,801	777	12,896
1988	178	99	436	83	263	20.96	24,577	1,022	8,958	785	13,414
1989	183	104	451	84	273	20.98	25,964	1,044	9,408	787	13,947
1990	193	110	472	86	287	22.00	27,298	1,054	9,761	810	14,372
1991	198	113	475	88	297	21.00	27,420	1,043	9,103	786	13,365
1992	203	115	466	81	297	20.00	27,857	1,008	8,910	770	13,088
1993	208	117	463	81	297	18.00	27,639	988	8,519	755	12,641
1994	213	120	475	82	306	18.00	28,738	1,019	8,840	725	13,222
1995	219	122	487	82	313	19.00	30,065	1,043	8,813	702	13,381
1996	224	125	498	83	320	20.00	30,559	1,046	8,971	712	13,592
1997	229	127	510	83	328	21.00	31,857	1,070	9,074	711	13,951
1998	234	129	531	84	341	21.00	33,614	1,116	9,467	697	14,579
1999	239	132	556	86	358	21.00	34,847	1,161	10,563	740	16,052
2000	244	134	572	90	366	22.00	36,821	1,205	11,408	780	17,171
2001	247	137	583	91	374	21.00	36,158	1,227	11,256	762	16,851
2002	251	140	583	92	379	21.00	35,472	1,210	10,965	742	16,709
2003	254	143	593	93	388	22.00	35,935	1,219	11,049	748	16,848
2004	257	146	611	95	402	22.00	36,816	1,238	11,221	760	17,130
2005	260	149	625	96	415	22.00	37,827	1,258	11,402	772	17,432
2006	263	152	645	99	431	23.00	39,493	1,297	11,749	795	17,993
2007	266	155	664	101	447	23.00	40,964	1,331	12,047	815	18,477
2008	269	158	680	103	460	24.00	43,168	1,381	12,499	845	19,209
2009	272	161	698	105	475	25.00	44,653	1,416	12,804	865	19,704
2010	275	165	716	107	489	25.00	46,326	1,456	13,155	888	20,270
2011	279	172	736	109	505	26.00	47,750	1,490	13,455	908	20,755
2012	282	179	753	111	517	26.00	49,224	1,525	13,769	929	21,260
2013	286	186	769	114	529	27.00	50,731	1,562	14,095	951	21,783

Annual Growth Rates (%)											
1980-1990	2.3	4.1	3.9	3.9	3.9	4.7	4.4	2.7	3.6	1.2	3.7
1990-2000	2.4	2.0	1.9	0.5	2.5	0.0	3.0	1.3	1.6	-0.4	1.8
2000-2003	1.2	2.2	1.2	1.1	2.0	0.0	-0.8	0.4	-1.1	-1.4	-0.6
2003-2008	1.2	2.0	2.8	2.1	3.5	1.8	3.7	2.5	2.5	2.5	2.7
2008-2013	1.2	3.2	2.5	2.1	2.8	2.4	3.3	2.5	2.4	2.4	2.5
2003-2013	1.2	2.6	2.6	2.1	3.1	2.1	3.5	2.5	2.5	2.4	2.6

Table F-4
Commercial Forecast Drivers by Planning Area

SCE

	Thousands of Persons						Millions of 2001 $				
Year	Population 0-17	Population 65+	Total Emp.	Retail Emp.	Office Emp.	Wholesale Emp.	Personal Income	Restaurant Sales	Retail Sales	Food Sales	Total Sales
1980	1,442	667	3,142	521	1,348	203.98	181,347	7,620	62,300	5,795	97,404
1981	1,464	675	3,191	533	1,377	205.86	182,036	7,641	60,608	5,597	95,775
1982	1,477	690	3,118	524	1,373	204.71	182,448	7,554	56,569	5,716	88,491
1983	1,489	705	3,145	528	1,400	211.89	189,274	8,075	61,050	5,973	94,356
1984	1,494	717	3,287	560	1,463	226.29	202,547	8,467	65,093	5,982	102,491
1985	1,512	731	3,397	581	1,523	233.85	210,010	8,670	66,717	5,943	105,498
1986	1,535	751	3,504	600	1,588	239.85	216,554	8,889	67,219	5,855	106,483
1987	1,541	767	3,617	620	1,650	243.13	225,672	9,171	70,194	5,396	110,309
1988	1,536	780	3,738	642	1,716	258.26	233,180	9,347	71,720	5,345	113,457
1989	1,528	793	3,820	650	1,779	268.77	238,884	9,432	73,549	5,559	116,503
1990	1,563	815	3,859	648	1,841	270.99	245,440	9,257	70,692	5,467	112,311
1991	1,610	831	3,768	623	1,854	257.12	240,339	8,891	65,049	5,156	102,209
1992	1,661	847	3,675	606	1,844	248.37	243,221	8,502	63,779	4,923	98,169
1993	1,703	859	3,604	599	1,845	236.88	239,523	8,294	61,191	4,680	95,140
1994	1,747	872	3,627	600	1,861	242.90	242,882	8,509	62,758	4,467	97,791
1995	1,788	884	3,681	614	1,891	248.71	250,423	8,609	62,824	4,403	98,577
1996	1,830	896	3,744	619	1,928	253.79	259,045	8,837	64,056	4,471	101,122
1997	1,880	912	3,848	632	1,974	263.71	269,936	9,154	66,027	4,618	105,266
1998	1,930	927	3,993	647	2,052	272.82	287,000	9,615	68,625	4,616	109,066
1999	1,975	941	4,089	665	2,114	278.82	295,245	10,112	74,147	4,755	116,099
2000	2,024	956	4,206	691	2,188	281.54	314,927	10,573	79,841	4,727	123,208
2001	2,046	979	4,262	706	2,232	278.42	311,200	10,654	77,831	4,663	119,279
2002	2,068	1,001	4,267	716	2,257	280.50	307,689	10,581	76,417	4,576	119,208
2003	2,089	1,024	4,347	732	2,308	287.02	313,849	10,735	77,521	4,641	121,016
2004	2,111	1,046	4,469	751	2,386	293.28	323,465	10,970	79,194	4,740	123,772
2005	2,130	1,068	4,579	768	2,461	300.35	335,543	11,257	81,245	4,861	127,170
2006	2,150	1,090	4,706	789	2,542	309.21	350,256	11,601	83,701	5,005	131,250
2007	2,172	1,112	4,830	805	2,627	315.83	363,417	11,906	85,861	5,131	134,848
2008	2,194	1,135	4,930	820	2,698	323.77	382,851	12,354	89,061	5,322	140,169
2009	2,216	1,158	5,034	837	2,773	330.75	395,472	12,645	91,120	5,442	143,602
2010	2,238	1,181	5,132	851	2,842	336.85	408,968	12,956	93,320	5,572	147,271
2011	2,243	1,229	5,229	862	2,911	343.36	418,553	13,165	94,797	5,658	149,770
2012	2,247	1,276	5,293	872	2,961	349.37	428,024	13,373	96,258	5,742	152,241
2013	2,252	1,324	5,352	879	3,006	355.69	437,167	13,573	97,670	5,823	154,629
Annual Growth Rates (%)											
1980-1990	0.8	2.0	2.1	2.2	3.2	2.9	3.1	2.0	1.3	-0.6	1.4
1990-2000	2.6	1.6	0.9	0.6	1.7	0.4	2.5	1.3	1.2	-1.4	0.9
2000-2003	1.1	2.3	1.1	1.9	1.8	0.6	-0.1	0.5	-1.0	-0.6	-0.6
2003-2008	1.0	2.1	2.5	2.3	3.2	2.4	4.1	2.8	2.8	2.8	3.0
2008-2013	0.5	3.1	1.7	1.4	2.2	1.9	2.7	1.9	1.9	1.8	2.0
2003-2013	0.8	2.6	2.1	1.8	2.7	2.2	3.4	2.4	2.3	2.3	2.5

Table F-4
Commercial Forecast Drivers by Planning Area

LADWP

	Thousands of Persons						Millions of 2001 $				
Year	Population 0-17	Population 65+	Total Emp.	Retail Emp.	Office Emp.	Wholesale Emp.	Personal Income	Restaurant Sales	Retail Sales	Food Sales	Total Sales
1980	589	295	1,439	216	615	105.73	74,950	3,147	25,899	2,327	41,247
1981	601	297	1,452	218	624	104.99	74,999	3,139	24,952	2,216	40,167
1982	611	303	1,411	212	618	103.86	75,123	3,080	22,984	2,248	36,655
1983	619	309	1,414	215	629	105.10	77,945	3,257	24,412	2,341	38,362
1984	623	313	1,462	227	653	111.10	82,952	3,417	25,867	2,348	41,201
1985	631	318	1,502	233	676	113.94	85,771	3,475	26,495	2,321	42,275
1986	642	325	1,542	240	699	116.38	88,205	3,573	26,523	2,284	42,409
1987	644	329	1,583	247	722	116.41	91,678	3,684	27,452	2,091	43,591
1988	640	332	1,616	256	747	117.26	93,940	3,761	27,936	2,068	44,458
1989	634	334	1,648	259	774	120.90	95,539	3,803	28,544	2,134	45,652
1990	647	341	1,658	259	796	119.77	98,902	3,730	27,534	2,087	44,156
1991	658	342	1,584	242	787	110.74	95,063	3,519	24,837	1,931	39,323
1992	665	340	1,498	229	759	101.45	93,966	3,273	23,835	1,798	36,411
1993	680	343	1,456	225	754	94.65	92,067	3,146	22,572	1,694	35,146
1994	694	345	1,452	222	755	96.63	92,411	3,219	23,049	1,607	35,925
1995	710	348	1,467	225	766	98.02	95,032	3,243	22,944	1,577	35,804
1996	725	351	1,485	226	778	99.02	97,851	3,325	23,247	1,588	36,221
1997	733	351	1,495	226	781	101.02	99,591	3,380	23,309	1,610	36,758
1998	742	351	1,515	228	793	103.06	104,596	3,501	23,642	1,584	37,349
1999	755	353	1,528	233	806	104.42	106,259	3,646	25,327	1,618	39,276
2000	764	353	1,547	240	822	104.33	110,995	3,761	27,068	1,622	41,241
2001	765	358	1,548	243	829	102.63	108,586	3,752	26,110	1,549	39,549
2002	765	362	1,536	244	831	102.13	106,318	3,691	25,384	1,505	39,138
2003	766	367	1,554	248	842	103.83	107,773	3,721	25,593	1,518	39,488
2004	767	371	1,588	253	865	105.94	110,446	3,781	26,000	1,542	40,159
2005	770	377	1,622	258	888	107.92	114,196	3,867	26,587	1,576	41,125
2006	773	382	1,662	264	915	110.20	118,600	3,965	27,251	1,615	42,225
2007	774	387	1,692	267	937	111.89	121,906	4,032	27,689	1,640	42,970
2008	774	391	1,712	269	954	113.17	127,183	4,144	28,441	1,684	44,227
2009	775	396	1,733	272	971	114.78	130,109	4,200	28,815	1,705	44,867
2010	776	400	1,751	274	986	116.03	133,254	4,262	29,224	1,729	45,564
2011	779	419	1,788	278	1,012	118.21	136,549	4,337	29,717	1,757	46,381
2012	783	437	1,813	281	1,030	120.37	139,731	4,409	30,189	1,784	47,163
2013	787	457	1,836	284	1,048	122.57	142,851	4,479	30,653	1,811	47,933
Annual Growth Rates (%)											
1980-1990	0.9	1.5	1.4	1.8	2.6	1.3	2.8	1.7	0.6	-1.1	0.7
1990-2000	1.7	0.3	-0.7	-0.8	0.3	-1.4	1.2	0.1	-0.2	-2.5	-0.7
2000-2003	0.1	1.3	0.1	1.2	0.8	-0.2	-1.0	-0.4	-1.8	-2.2	-1.4
2003-2008	0.2	1.3	2.0	1.6	2.5	1.7	3.4	2.2	2.1	2.1	2.3
2008-2013	0.3	3.1	1.4	1.1	1.9	1.6	2.4	1.6	1.5	1.5	1.6
2003-2013	0.3	2.2	1.7	1.3	2.2	1.7	2.9	1.9	1.8	1.8	2.0

Table F-4
Commercial Forecast Drivers by Planning Area

SDG&E

	Thousands of Persons						Millions of 2001 $				
Year	Population 0-17	Population 65+	Total Emp.	Retail Emp.	Office Emp.	Wholesale Emp.	Personal Income	Restaurant Sales	Retail Sales	Food Sales	Total Sales
1980	374	202	703	134	348	27.52	46,803	2,011	15,442	1,485	23,023
1981	379	205	722	135	360	29.75	47,836	2,053	15,685	1,448	23,290
1982	381	210	719	137	363	31.88	48,782	2,085	15,026	1,526	22,126
1983	384	214	734	143	372	35.19	51,105	2,286	16,585	1,646	24,055
1984	389	220	786	155	395	36.65	56,063	2,404	18,173	1,773	26,837
1985	398	227	838	162	421	40.05	59,303	2,556	19,489	1,832	28,691
1986	410	238	881	172	446	41.34	62,180	2,658	20,284	1,859	29,967
1987	420	249	930	182	474	46.56	65,228	2,778	21,454	1,674	31,145
1988	429	261	987	199	499	45.63	68,695	2,914	22,258	1,718	32,680
1989	438	275	1,027	206	520	47.09	72,042	2,943	23,050	1,844	34,224
1990	465	289	1,058	209	547	49.42	73,179	2,943	22,191	1,836	32,784
1991	482	295	1,058	206	563	47.43	73,165	2,883	20,647	1,751	30,166
1992	500	301	1,049	198	574	45.80	74,306	2,817	20,732	1,689	30,186
1993	517	307	1,050	202	579	46.01	74,083	2,785	20,399	1,628	29,476
1994	535	313	1,065	202	592	49.48	75,959	2,837	20,600	1,550	29,936
1995	553	320	1,097	202	611	53.06	78,594	2,934	20,722	1,530	30,597
1996	571	326	1,134	208	632	55.65	82,779	3,033	21,413	1,560	31,991
1997	588	331	1,187	212	657	58.19	87,351	3,146	22,513	1,615	34,226
1998	605	337	1,249	216	692	59.74	93,834	3,324	24,031	1,638	36,347
1999	622	343	1,304	223	726	61.11	98,948	3,494	26,245	1,713	39,385
2000	639	349	1,355	232	757	61.29	101,819	3,696	28,565	1,758	42,146
2001	651	356	1,388	236	781	61.36	100,739	3,732	28,128	1,698	41,326
2002	663	363	1,390	241	787	61.64	100,059	3,724	27,736	1,674	41,486
2003	675	371	1,412	246	801	63.13	101,778	3,767	28,057	1,693	42,003
2004	687	378	1,444	251	824	64.41	104,522	3,835	28,560	1,723	42,808
2005	698	385	1,479	257	851	65.80	108,265	3,928	29,253	1,764	43,916
2006	710	392	1,517	263	877	67.30	112,957	4,048	30,120	1,815	45,300
2007	721	399	1,560	270	909	69.70	117,731	4,172	31,031	1,870	46,744
2008	733	406	1,598	276	936	72.10	124,592	4,350	32,330	1,946	48,802
2009	745	413	1,638	283	965	73.50	129,298	4,473	33,226	2,000	50,223
2010	756	420	1,676	290	992	75.91	134,347	4,604	34,185	2,056	51,744
2011	765	430	1,720	295	1,022	77.32	138,589	4,716	34,992	2,104	53,024
2012	773	439	1,753	300	1,046	79.65	142,725	4,824	35,775	2,151	54,262
2013	781	449	1,785	306	1,067	81.10	146,766	4,930	36,539	2,195	55,471
Annual Growth Rates (%)											
1980-1990	2.2	3.7	4.2	4.6	4.6	6.0	4.6	3.9	3.7	2.1	3.6
1990-2000	3.2	1.9	2.5	1.0	3.3	2.2	3.4	2.3	2.6	-0.4	2.5
2000-2003	1.9	2.1	1.4	2.1	1.9	1.0	0.0	0.6	-0.6	-1.2	-0.1
2003-2008	1.7	1.8	2.5	2.3	3.2	2.7	4.1	2.9	2.9	2.8	3.0
2008-2013	1.3	2.0	2.2	2.1	2.7	2.4	3.3	2.5	2.5	2.4	2.6
2003-2013	1.5	1.9	2.4	2.2	2.9	2.5	3.7	2.7	2.7	2.6	2.8

Table F-4
Commercial Forecast Drivers by Planning Area

OTHER

	Thousands of Persons						Millions of 2001 $				
Year	Population 0-17	Population 65+	Total Emp.	Retail Emp.	Office Emp.	Wholesale Emp.	Personal Income	Restaurant Sales	Retail Sales	Food Sales	Total Sales
1980	29	17	40	7	22	1.13	2,880	133	1,009	127	1,416
1981	28	18	38	8	21	1.13	2,702	133	940	134	1,333
1982	28	18	36	7	19	1.13	2,658	124	852	131	1,187
1983	27	19	37	7	19	1.13	2,755	131	884	134	1,249
1984	27	19	39	8	20	1.40	2,918	136	912	133	1,310
1985	28	19	39	9	21	1.40	2,991	131	909	138	1,300
1986	28	20	40	9	21	1.55	3,081	134	928	133	1,317
1987	30	21	42	9	22	0.39	3,190	142	956	143	1,380
1988	31	22	46	9	24	0.38	3,314	147	999	150	1,481
1989	32	23	48	9	27	0.49	3,491	149	1,043	154	1,551
1990	32	23	50	9	28	0.64	3,628	152	1,047	153	1,582
1991	32	24	50	9	28	0.63	3,635	143	1,000	148	1,497
1992	32	24	52	10	29	0.62	3,686	142	1,000	143	1,487
1993	32	25	51	11	29	0.61	3,700	140	986	138	1,466
1994	32	25	54	12	32	0.60	3,813	141	986	128	1,478
1995	32	26	55	11	33	0.59	3,910	139	976	125	1,496
1996	32	26	57	13	34	0.67	4,020	137	978	123	1,477
1997	32	27	57	14	34	0.66	4,224	136	984	120	1,493
1998	33	27	60	14	36	0.65	4,416	134	985	117	1,491
1999	33	28	61	14	37	1.64	4,556	143	1,067	125	1,634
2000	33	28	64	14	39	1.64	4,838	146	1,124	126	1,743
2001	33	29	65	14	39	0.63	4,685	137	1,078	119	1,657
2002	33	29	65	14	40	0.62	4,591	133	1,050	117	1,643
2003	33	29	66	14	41	0.61	4,664	135	1,062	118	1,660
2004	33	30	67	14	42	0.61	4,780	138	1,081	119	1,692
2005	33	30	68	14	43	1.61	4,944	142	1,106	121	1,734
2006	34	31	70	15	44	1.60	5,155	146	1,139	125	1,787
2007	34	31	72	15	46	1.66	5,359	150	1,172	129	1,840
2008	34	31	74	15	46	1.65	5,651	156	1,218	133	1,915
2009	34	32	76	16	47	1.64	5,840	160	1,247	136	1,961
2010	34	32	77	16	51	1.63	6,044	163	1,276	138	2,011
2011	34	33	79	17	51	1.62	6,199	166	1,297	142	2,046
2012	35	34	81	17	52	1.62	6,400	171	1,331	144	2,101
2013	36	35	82	18	53	1.69	6,597	174	1,363	147	2,154

Annual Growth Rates (%)

1980-1990	1.0	3.1	2.3	3.3	2.3	-5.5	2.3	1.3	0.4	1.9	1.1
1990-2000	0.3	2.0	2.6	4.0	3.4	9.8	2.9	-0.4	0.7	-2.0	1.0
2000-2003	0.4	1.5	1.3	0.4	2.2	-27.9	-1.2	-2.5	-1.9	-2.2	-1.6
2003-2008	0.3	1.3	2.1	1.0	2.2	21.9	3.9	2.9	2.8	2.6	2.9
2008-2013	1.2	2.4	2.2	4.4	2.7	0.4	3.1	2.2	2.3	2.0	2.4
2003-2013	0.7	1.9	2.1	2.7	2.5	10.6	3.5	2.6	2.5	2.3	2.6

Table F-4
Commercial Forecast Drivers by Planning Area

BGP

	Thousands of Persons						Millions of 2001 $				
Year	Population 0-17	Population 65+	Total Emp.	Retail Emp.	Office Emp.	Wholesale Emp.	Personal Income	Restaurant Sales	Retail Sales	Food Sales	Total Sales
1980	67	33	163	24	70	12.02	8,499	356	2,932	264	4,673
1981	68	34	165	25	71	11.93	8,500	355	2,824	251	4,548
1982	69	34	160	24	70	11.79	8,510	348	2,600	254	4,148
1983	70	35	160	24	71	11.93	8,826	368	2,761	265	4,340
1984	71	35	166	26	74	12.60	9,389	386	2,925	265	4,661
1985	71	36	170	26	76	12.89	9,682	392	2,988	262	4,770
1986	72	37	174	27	79	13.16	9,953	403	2,991	257	4,783
1987	73	37	179	28	81	13.16	10,343	415	3,095	235	4,915
1988	72	37	182	29	84	13.25	10,592	424	3,147	233	5,008
1989	71	38	186	29	87	13.65	10,766	428	3,214	240	5,139
1990	73	38	187	29	90	13.52	11,140	420	3,098	235	4,970
1991	74	39	179	27	89	12.56	10,762	398	2,809	218	4,448
1992	76	39	170	26	86	11.56	10,690	372	2,709	204	4,138
1993	78	39	166	26	86	10.83	10,518	359	2,576	193	4,011
1994	80	40	166	25	87	11.10	10,596	369	2,640	184	4,116
1995	82	40	169	26	88	11.33	10,962	374	2,644	182	4,127
1996	84	41	172	26	90	11.49	11,331	385	2,690	184	4,190
1997	85	41	174	26	91	11.79	11,604	393	2,713	187	4,279
1998	87	41	177	27	93	12.07	12,224	409	2,761	185	4,361
1999	89	41	179	27	95	12.29	12,481	428	2,972	190	4,609
2000	90	42	183	28	97	12.35	13,112	444	3,195	191	4,868
2001	91	42	183	29	98	12.19	12,871	444	3,092	183	4,684
2002	91	43	183	29	99	12.19	12,664	439	3,021	179	4,658
2003	92	44	186	30	101	12.45	12,901	445	3,061	181	4,723
2004	92	45	191	30	104	12.76	13,279	454	3,124	185	4,824
2005	93	46	196	31	107	13.08	13,819	468	3,215	190	4,973
2006	94	46	202	32	111	13.42	14,421	482	3,311	196	5,130
2007	94	47	206	32	114	13.69	14,888	492	3,379	200	5,244
2008	95	48	210	33	117	13.91	15,606	508	3,487	206	5,423
2009	96	49	214	33	120	14.18	16,040	517	3,550	210	5,527
2010	96	49	217	34	122	14.40	16,506	528	3,617	214	5,640
2011	97	52	222	34	126	14.72	16,972	539	3,691	218	5,760
2012	98	55	226	35	129	15.08	17,470	551	3,771	222	5,892
2013	99	57	231	36	132	15.44	17,959	563	3,851	227	6,021
Annual Growth Rates (%)											
1980-1990	0.9	1.4	1.4	1.7	2.5	1.2	2.7	1.7	0.6	-1.2	0.6
1990-2000	2.2	0.8	-0.2	-0.3	0.8	-0.9	1.6	0.6	0.3	-2.0	-0.2
2000-2003	0.5	1.7	0.6	1.6	1.3	0.3	-0.5	0.1	-1.4	-1.8	-1.0
2003-2008	0.7	1.8	2.5	2.1	3.0	2.2	3.9	2.7	2.6	2.6	2.8
2008-2013	0.8	3.6	1.9	1.6	2.4	2.1	2.8	2.1	2.0	2.0	2.1
2003-2013	0.8	2.7	2.2	1.8	2.7	2.2	3.4	2.4	2.3	2.3	2.5

Table F-3
Industrial Shipments by SIC and Planning Area
(Millions of 2001 $)

SIC	Planning Area	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Annual Growth Rates (%) 1990-2000	2000-2003	2003-2013
10	BGP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11.1	4.4	3.1
13	BGP	17	27	13	16	15	16	16	16	17	17	17	17	17	17	17	17	-2.5	5.7	0.9
14	BGP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
15	BGP	1,473	1,393	1,899	1,958	1,795	1,811	1,844	1,856	1,905	1,908	1,871	1,856	1,848	1,836	1,822	1,813	2.6	-1.6	0.0
203	BGP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-0.7	4.3	3.7
206	BGP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
20x	BGP	420	423	497	493	516	527	535	554	567	582	596	611	621	633	644	653	1.7	2.0	2.2
22	BGP	14	20	40	36	36	35	35	37	38	40	42	44	45	47	48	49	10.9	-4.2	3.5
23	BGP	137	179	269	281	301	308	313	318	314	308	301	294	290	285	281	278	6.9	4.6	-1.0
24	BGP	20	15	18	17	17	16	17	18	19	19	19	20	20	20	21	21	-1.0	-3.4	2.5
25	BGP	70	66	92	86	85	84	90	95	95	98	100	102	104	107	109	112	2.7	-2.7	2.9
261	BGP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
262	BGP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-11.7	-4.6	0.6
26X	BGP	35	36	38	35	34	33	36	39	40	41	42	43	44	45	46	47	0.8	-3.7	3.6
27	BGP	475	417	447	421	414	426	439	456	471	469	464	462	461	459	457	456	-0.6	-1.6	0.7
28	BGP	350	369	484	464	458	495	542	592	633	660	675	684	701	715	727	739	3.3	0.8	4.1
29	BGP	6	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	-2.3	-0.1	-2.9
308	BGP	178	183	212	203	202	205	214	227	240	239	236	231	230	227	225	223	1.7	-1.1	0.9
30X	BGP	16	18	20	19	19	19	19	20	22	22	22	21	21	21	21	21	2.4	-1.8	1.3
31	BGP	4	5	6	5	5	5	6	7	7	7	7	7	7	7	7	7	2.4	-1.2	3.1
321	BGP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-26.4	-3.3	1.0
324	BGP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
32X	BGP	22	17	24	22	22	23	24	25	25	25	26	26	27	27	27	27	0.9	-1.2	1.6
33	BGP	65	58	72	68	67	67	69	73	77	78	80	83	85	86	88	90	1.0	-2.3	2.9
34	BGP	448	426	502	475	475	487	510	539	555	561	558	553	552	551	549	546	1.1	-1.0	1.2
357	BGP	34	98	633	524	339	344	331	332	320	333	368	400	412	431	451	471	34.0	-18.4	3.2
35X	BGP	202	201	271	253	213	200	203	210	214	221	225	226	227	228	229	231	2.9	-9.6	1.5
366	BGP	63	99	215	202	175	183	192	201	209	215	224	236	242	248	254	261	13.0	-5.1	3.6
367	BGP	80	139	299	259	191	228	262	297	324	348	412	473	516	563	614	663	14.1	-8.7	11.3
36X	BGP	330	344	416	385	343	326	338	357	373	381	392	399	403	406	409	413	2.3	-7.8	2.4
37	BGP	3,330	1,775	1,788	1,683	1,239	1,146	1,165	1,251	1,362	1,452	1,523	1,603	1,693	1,764	1,828	1,887	-6.0	-13.8	5.1
38	BGP	1,311	1,019	1,126	1,136	1,098	1,191	1,257	1,329	1,393	1,436	1,474	1,530	1,565	1,592	1,624	1,660	-1.5	1.9	3.4
39	BGP	48	58	86	81	80	82	86	90	97	95	92	89	88	87	85	84	6.1	-1.9	0.3
10	LADWP	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	11.1	4.4	3.1
13	LADWP	157	246	121	145	141	143	146	148	151	153	157	157	157	157	157	157	-2.5	5.7	0.9
14	LADWP	57	48	35	36	35	35	38	42	40	41	42	42	42	43	43	43	-4.7	-0.3	2.0
15	LADWP	4,690	4,435	6,047	6,234	5,714	5,766	5,872	5,910	6,065	6,075	5,957	5,909	5,884	5,847	5,801	5,772	2.6	-1.6	0.0
203	LADWP	203	178	190	192	207	216	223	235	243	254	265	277	286	294	303	310	-0.7	4.3	3.7
206	LADWP	28	24	29	29	31	32	32	33	34	35	36	37	37	38	38	39	0.2	3.2	2.0
20x	LADWP	5,564	5,342	6,006	5,928	6,186	6,289	6,346	6,549	6,665	6,822	6,950	7,104	7,199	7,309	7,415	7,509	0.8	1.5	1.8
22	LADWP	421	597	1,128	1,035	1,020	996	1,008	1,046	1,099	1,145	1,203	1,267	1,309	1,354	1,394	1,437	10.4	-4.1	3.7
23	LADWP	4,858	6,102	9,267	9,739	10,461	10,687	10,882	11,042	10,931	10,720	10,493	10,287	10,139	10,003	9,863	9,753	6.7	4.9	-0.9
24	LADWP	224	164	202	187	189	182	188	200	213	218	217	222	226	229	231	234	-1.0	-3.4	2.5
25	LADWP	1,044	900	1,180	1,120	1,101	1,101	1,175	1,248	1,251	1,281	1,309	1,346	1,369	1,403	1,437	1,471	1.2	-2.3	2.9
261	LADWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
262	LADWP	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-11.7	-4.6	0.6
26X	LADWP	380	363	345	319	306	303	320	345	354	362	371	382	388	396	403	412	-1.0	-4.2	3.1
27	LADWP	3,649	3,111	3,267	3,091	3,055	3,156	3,258	3,401	3,523	3,527	3,506	3,507	3,513	3,510	3,506	3,509	-1.1	-1.1	1.1
28	LADWP	2,194	2,081	2,843	2,720	2,679	2,889	3,155	3,443	3,674	3,828	3,915	3,972	4,073	4,157	4,226	4,297	2.6	0.5	4.0
29	LADWP	3,000	2,397	2,381	2,288	2,320	2,376	2,400	2,519	2,559	2,384	2,261	2,040	1,979	1,929	1,847	1,772	-2.3	-0.1	-2.9
308	LADWP	748	700	645	607	595	591	606	630	653	640	622	601	590	576	564	554	-1.5	-2.8	-0.7
30X	LADWP	74	73	73	71	69	68	71	74	77	77	76	75	75	74	73	72	-0.1	-2.1	0.6
31	LADWP	230	234	291	268	281	280	308	337	362	372	368	374	376	377	378	379	2.4	-1.2	3.1
321	LADWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-26.4	-3.3	1.0
324	LADWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27.5	2.5	4.9
32X	LADWP	319	252	310	294	295	301	311	324	333	335	342	350	351	351	353	354	-0.3	-1.0	1.6
33	LADWP	953	737	822	772	756	756	771	807	842	857	871	889	906	920	934	947	-1.5	-2.8	2.3
34	LADWP	1,772	1,546	1,649	1,554	1,547	1,576	1,639	1,721	1,759	1,765	1,748	1,724	1,713	1,703	1,690	1,676	-0.7	-1.5	0.6

Table F-3
Industrial Shipments by SIC and Planning Area
(Millions of 2001 $)

SIC	Planning Area	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	1990-2000	2000-2003	2003-2013
357	LADWP	460	983	5,941	4,897	3,147	3,165	3,028	3,024	2,865	2,977	3,276	3,545	3,627	3,776	3,943	4,096	29.2	-18.9	2.6
35X	LADWP	1,275	1,153	1,369	1,275	1,068	991	995	1,019	1,031	1,053	1,066	1,059	1,054	1,051	1,051	1,051	0.7	-10.2	0.6
366	LADWP	220	387	784	743	646	678	713	752	785	810	848	899	924	950	978	1,005	13.5	-4.7	4.0
367	LADWP	935	1,147	2,261	1,938	1,428	1,687	1,916	2,127	2,281	2,425	2,839	3,232	3,487	3,775	4,090	4,384	9.2	-9.3	10.0
36X	LADWP	921	835	973	908	813	765	791	832	864	880	907	923	931	936	941	950	0.5	-7.7	2.2
37	LADWP	6,221	3,033	2,833	2,678	1,932	1,749	1,764	1,891	2,063	2,201	2,309	2,431	2,570	2,679	2,777	2,867	-7.6	-14.9	5.1
38	LADWP	3,511	2,586	2,691	2,691	2,589	2,785	2,920	3,077	3,214	3,304	3,391	3,525	3,602	3,661	3,734	3,816	-2.6	1.2	3.2
39	LADWP	656	756	983	913	888	903	940	976	1,048	1,025	992	950	939	921	904	889	4.1	-2.8	-0.2
10	OTHER	13	27	58	69	58	57	62	66	63	63	65	66	67	68	69	69	15.8	-0.6	1.9
13	OTHER	6	12	17	18	17	17	18	19	20	21	22	22	22	22	23	23	10.6	1.5	2.7
14	OTHER	105	121	219	228	210	211	229	241	228	227	229	231	232	231	230	230	7.6	-1.3	0.9
15	OTHER	1,782	1,737	2,468	2,527	2,349	2,357	2,366	2,341	2,351	2,321	2,239	2,181	2,141	2,100	2,058	2,023	3.3	-1.5	-1.5
203	OTHER	180	139	148	141	145	144	142	141	137	136	134	132	130	129	127	125	-1.9	-0.9	-1.4
206	OTHER	391	307	452	460	495	516	531	559	576	599	619	641	655	670	684	696	1.5	4.5	3.0
20x	OTHER	18	45	83	86	90	92	95	101	104	111	116	121	126	130	135	139	16.6	3.7	4.2
22	OTHER	2	4	5	5	6	6	6	6	6	7	6	6	6	6	6	6	11.4	5.7	0.1
23	OTHER	113	159	140	137	143	137	133	132	126	124	122	118	116	114	112	110	2.2	-0.7	-2.2
24	OTHER	284	238	273	248	240	222	222	229	238	237	232	230	230	228	226	225	-0.4	-6.7	0.2
25	OTHER	5	7	7	6	6	6	6	7	7	7	7	8	8	8	8	8	3.7	-3.9	3.0
261	OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
262	OTHER	44	42	23	22	21	20	21	23	24	25	25	26	26	26	27	27	-6.5	-3.6	2.8
26X	OTHER	64	85	77	72	70	73	79	86	88	89	90	90	90	91	91	92	1.9	-1.7	2.3
27	OTHER	130	313	518	505	508	535	574	624	678	708	727	750	773	792	809	826	14.8	1.1	4.4
28	OTHER	53	57	74	70	70	73	79	85	89	91	94	94	96	98	99	100	3.3	-0.2	3.2
29	OTHER	11	18	19	17	17	17	18	19	19	18	18	18	18	19	18	18	6.1	-4.0	0.7
308	OTHER	60	104	143	138	138	142	151	163	175	179	180	179	181	181	181	182	9.1	-0.1	2.5
30X	OTHER	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1.1	4.5	4.5
31	OTHER	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-8.8	-2.1	-0.4
321	OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
324	OTHER	23	24	38	36	37	38	40	42	43	44	45	46	46	46	46	47	5.1	-0.5	2.1
32X	OTHER	73	47	58	53	51	51	52	53	53	52	52	52	51	50	50	49	-2.3	-4.3	-0.4
33	OTHER	81	65	75	72	72	74	77	82	84	85	85	85	86	87	87	87	-0.8	-0.4	1.6
34	OTHER	81	89	115	107	103	101	102	106	108	107	105	103	102	100	99	98	3.5	-4.1	-0.4
357	OTHER	216	800	9,216	7,885	5,253	5,468	5,413	5,607	5,540	5,929	6,769	7,815	8,277	8,904	9,614	10,319	45.6	-16.0	6.6
35X	OTHER	44	53	79	75	62	57	58	59	60	62	64	64	65	65	66	66	6.0	-10.0	1.4
366	OTHER	8	16	53	50	42	45	47	50	52	54	58	62	65	67	70	72	21.4	-5.3	4.8
367	OTHER	113	598	1,417	1,243	925	1,113	1,297	1,490	1,659	1,823	2,196	2,560	2,831	3,133	3,462	3,779	28.8	-7.7	13.0
36X	OTHER	99	85	125	103	90	85	93	100	105	107	110	112	113	113	114	115	2.4	-12.1	3.0
37	OTHER	102	44	38	36	29	28	28	30	33	35	37	38	40	42	43	45	-9.5	-9.6	4.9
38	OTHER	29	128	244	253	247	268	286	303	320	337	352	370	382	394	406	419	23.7	3.1	4.6
39	OTHER	15	29	30	27	26	27	28	29	31	31	30	29	29	29	29	29	7.0	-3.5	0.7
10	PG&E	257	451	337	356	369	373	399	443	423	427	437	446	452	456	460	465	2.7	3.4	2.2
13	PG&E	3,409	3,068	2,640	3,169	3,071	3,132	3,199	3,267	3,334	3,401	3,496	3,507	3,514	3,521	3,528	3,535	-2.5	5.9	1.2
14	PG&E	421	511	588	585	563	554	587	644	607	604	604	600	596	591	585	579	3.4	-2.0	0.5
15	PG&E	28,254	26,850	43,687	45,002	40,989	41,279	42,045	42,228	43,133	42,977	41,874	41,249	40,878	40,419	39,912	39,538	4.5	-1.9	-0.4
203	PG&E	6,955	6,717	6,877	6,850	7,189	7,333	7,441	7,681	7,815	8,010	8,179	8,382	8,487	8,609	8,722	8,815	-0.1	2.2	1.9
206	PG&E	1,451	1,361	1,463	1,438	1,513	1,531	1,545	1,582	1,606	1,638	1,669	1,705	1,723	1,744	1,763	1,779	0.1	1.5	1.5
20x	PG&E	16,250	18,700	23,265	23,283	24,199	24,672	25,102	26,128	26,834	27,741	28,468	29,262	29,842	30,474	31,069	31,604	3.7	2.0	2.5
22	PG&E	262	318	514	460	446	426	419	427	435	443	453	467	472	479	484	490	7.0	-6.1	1.4
23	PG&E	1,368	1,735	2,075	2,107	2,180	2,154	2,128	2,095	2,015	1,915	1,812	1,725	1,656	1,592	1,532	1,481	4.3	1.3	-3.7
24	PG&E	4,737	3,965	4,644	4,229	4,187	3,947	4,005	4,202	4,391	4,419	4,322	4,323	4,333	4,321	4,298	4,293	-0.2	-5.3	0.8
25	PG&E	708	703	929	870	853	846	903	954	955	976	990	1,012	1,026	1,047	1,067	1,089	2.8	-3.1	2.6
261	PG&E	149	59	44	39	38	36	37	38	37	36	35	33	32	30	29	27	-11.5	-6.3	-2.8
262	PG&E	223	299	324	294	288	284	300	327	332	336	340	347	348	350	352	353	3.8	-4.3	2.2
26X	PG&E	2,225	2,322	2,329	2,111	2,001	1,968	2,075	2,235	2,283	2,331	2,371	2,427	2,459	2,495	2,533	2,574	0.5	-5.5	2.7
27	PG&E	6,580	6,269	6,933	6,434	6,305	6,442	6,576	6,777	6,933	6,841	6,698	6,581	6,511	6,426	6,344	6,279	0.5	-2.4	-0.3
28	PG&E	6,084	7,258	9,564	9,140	9,014	9,748	10,697	11,732	12,559	13,113	13,409	13,567	13,922	14,207	14,433	14,670	4.6	0.6	4.2
29	PG&E	14,442	13,174	12,449	11,708	11,871	12,156	12,282	12,889	13,095	12,200	11,496	10,297	9,939	9,644	9,188	8,780	-1.5	-0.8	-3.2
308	PG&E	1,873	1,945	2,288	2,191	2,193	2,229	2,334	2,477	2,615	2,613	2,580	2,526	2,516	2,488	2,462	2,443	2.0	-0.9	0.9
30X	PG&E	270	293	375	367	365	367	388	417	445	453	456	457	461	463	464	466	3.3	-0.7	2.4
31	PG&E	121	107	128	116	120	117	129	144	157	163	163	167	169	171	173	175	0.5	-3.0	4.1

Table F-3
Industrial Shipments by SIC and Planning Area
(Millions of 2001 $)

SIC	Planning Area	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	1990-2000	2000-2003	2003-2013
321	PG&E	132	124	161	149	147	147	150	154	155	153	152	152	149	146	143	140	2.0	-2.9	-0.5
324	PG&E	205	195	304	286	291	300	313	334	346	352	362	372	375	378	380	383	4.0	-0.4	2.5
32X	PG&E	2,277	2,179	2,789	2,598	2,570	2,578	2,647	2,731	2,779	2,766	2,781	2,797	2,774	2,749	2,731	2,713	2.0	-2.6	0.5
33	PG&E	1,528	1,678	2,133	1,996	1,962	1,967	2,017	2,127	2,227	2,266	2,305	2,348	2,391	2,429	2,464	2,497	3.4	-2.7	2.4
34	PG&E	4,162	4,438	5,209	4,994	4,999	5,101	5,342	5,665	5,863	5,938	5,918	5,861	5,861	5,859	5,838	5,815	2.3	-0.7	1.3
357	PG&E	4,730	13,282	79,224	63,362	40,080	39,644	37,075	36,223	33,909	34,460	36,994	38,885	38,947	39,608	40,385	40,979	32.6	-20.6	0.3
35X	PG&E	3,456	5,705	8,808	8,222	6,878	6,481	6,639	6,977	7,203	7,466	7,664	7,798	7,871	7,957	8,060	8,169	9.8	-9.7	2.3
366	PG&E	2,535	5,034	11,712	11,050	9,704	10,214	10,732	11,311	11,810	12,116	12,589	13,176	13,473	13,764	14,086	14,394	16.5	-4.5	3.5
367	PG&E	8,413	15,429	31,077	26,282	19,269	22,735	25,915	28,873	30,995	32,789	38,174	43,111	46,334	49,929	53,844	57,464	14.0	-9.9	9.7
36X	PG&E	2,519	2,808	3,927	3,476	2,983	3,015	3,199	3,470	3,723	3,965	4,205	4,412	4,567	4,711	4,839	4,982	4.5	-8.4	5.2
37	PG&E	9,370	8,346	8,236	7,310	5,706	5,650	5,800	6,157	6,585	6,896	7,140	7,407	7,724	7,952	8,151	8,326	-1.3	-11.8	4.0
38	PG&E	8,790	9,969	14,584	15,324	15,187	16,780	17,989	19,265	20,363	21,202	21,950	22,892	23,565	24,102	24,707	25,363	5.2	4.8	4.2
39	PG&E	782	966	1,403	1,307	1,293	1,324	1,405	1,473	1,578	1,572	1,534	1,492	1,485	1,471	1,456	1,442	6.0	-1.9	0.9
10	SCE	58	124	168	177	186	191	210	235	226	231	238	243	248	252	255	258	11.1	4.4	3.1
13	SCE	1,870	2,934	1,450	1,733	1,679	1,713	1,741	1,769	1,798	1,826	1,873	1,875	1,876	1,877	1,878	1,879	-2.5	5.7	0.9
14	SCE	532	445	329	330	323	326	355	390	373	378	386	390	393	395	397	398	-4.7	-0.3	2.0
15	SCE	21,577	19,868	31,248	32,464	30,036	30,578	31,369	31,674	32,571	32,657	32,029	31,770	31,660	31,470	31,232	31,086	3.8	-0.7	0.2
203	SCE	2,585	2,400	2,424	2,419	2,564	2,635	2,693	2,802	2,878	2,975	3,068	3,178	3,243	3,316	3,384	3,445	-0.6	2.8	2.7
206	SCE	299	322	396	401	429	443	451	467	479	498	513	532	543	556	568	578	2.9	3.8	2.7
20x	SCE	7,220	7,516	9,116	9,063	9,513	9,740	9,912	10,303	10,569	10,889	11,170	11,480	11,695	11,931	12,158	12,361	2.4	2.2	2.4
22	SCE	1,024	1,449	2,945	2,696	2,648	2,582	2,616	2,706	2,836	2,944	3,080	3,226	3,322	3,425	3,517	3,614	11.1	-4.3	3.4
23	SCE	2,643	3,659	5,392	5,618	5,991	6,106	6,213	6,301	6,227	6,084	5,926	5,778	5,677	5,581	5,485	5,407	7.4	4.2	-1.2
24	SCE	2,415	1,772	2,259	2,093	2,103	2,009	2,064	2,187	2,317	2,360	2,344	2,381	2,415	2,435	2,449	2,471	-0.7	-3.8	2.1
25	SCE	2,884	2,816	3,970	3,741	3,660	3,640	3,882	4,110	4,113	4,206	4,294	4,412	4,484	4,592	4,698	4,809	3.2	-2.8	2.8
261	SCE	24	20	7	7	7	7	8	8	8	9	9	9	9	9	9	9	-10.9	-1.1	2.7
262	SCE	384	337	187	173	168	166	174	188	193	194	198	202	203	204	205	206	-6.9	-4.0	2.2
26X	SCE	3,770	3,885	4,128	3,840	3,695	3,686	3,918	4,260	4,388	4,518	4,643	4,803	4,905	5,013	5,128	5,247	0.9	-3.7	3.6
27	SCE	5,926	5,293	5,748	5,388	5,283	5,432	5,582	5,795	5,969	5,933	5,854	5,808	5,785	5,747	5,710	5,686	-0.3	-1.9	0.5
28	SCE	8,797	9,497	12,356	11,837	11,696	12,663	13,858	15,156	16,213	16,909	17,279	17,491	17,942	18,304	18,592	18,896	3.5	0.8	4.1
29	SCE	15,665	12,514	12,434	11,948	12,115	12,406	12,534	13,154	13,364	12,451	11,807	10,653	10,333	10,074	9,643	9,254	-2.3	-0.1	-2.9
308	SCE	4,834	5,039	5,991	5,742	5,732	5,825	6,101	6,487	6,856	6,842	6,765	6,634	6,610	6,540	6,475	6,431	2.2	-0.9	1.0
30X	SCE	955	1,104	1,228	1,190	1,172	1,164	1,211	1,280	1,352	1,359	1,355	1,341	1,343	1,336	1,330	1,326	2.5	-1.8	1.3
31	SCE	83	85	106	97	102	102	112	122	131	135	134	136	136	137	137	138	2.4	-1.2	3.1
321	SCE	18	50	62	59	58	57	59	60	62	62	62	62	62	61	60	59	13.4	-2.8	0.4
324	SCE	279	294	390	360	355	352	356	364	368	363	364	366	361	356	353	349	3.4	-3.4	-0.1
32X	SCE	2,841	2,281	3,155	2,975	2,989	3,041	3,146	3,279	3,379	3,398	3,464	3,538	3,547	3,552	3,565	3,576	1.1	-1.2	1.6
33	SCE	4,418	4,072	5,105	4,814	4,740	4,780	4,926	5,209	5,483	5,616	5,758	5,922	6,068	6,200	6,327	6,448	1.5	-2.2	3.0
34	SCE	8,557	8,285	9,924	9,406	9,410	9,646	10,116	10,706	11,044	11,166	11,120	11,024	11,015	11,006	10,966	10,922	1.5	-0.9	1.3
357	SCE	1,097	3,515	23,023	19,103	12,360	12,567	12,104	12,175	11,759	12,254	13,583	14,782	15,231	15,928	16,713	17,439	35.6	-18.3	3.3
35X	SCE	5,724	5,802	7,981	7,480	6,294	5,909	6,013	6,233	6,378	6,573	6,717	6,763	6,786	6,824	6,876	6,933	3.4	-9.5	1.6
366	SCE	1,181	1,794	3,974	3,736	3,237	3,385	3,533	3,703	3,848	3,949	4,112	4,330	4,430	4,535	4,650	4,762	12.9	-5.2	3.5
367	SCE	3,430	6,486	14,099	12,216	9,025	10,779	12,431	14,110	15,434	16,644	19,708	22,669	24,730	27,028	29,530	31,905	15.2	-8.6	11.5
36X	SCE	4,476	4,792	5,832	5,387	4,799	4,563	4,730	4,999	5,223	5,341	5,505	5,600	5,659	5,700	5,735	5,794	2.7	-7.9	2.4
37	SCE	29,222	15,854	16,196	15,239	11,252	10,443	10,638	11,424	12,434	13,255	13,901	14,630	15,453	16,100	16,679	17,214	-5.7	-13.6	5.1
38	SCE	12,422	9,792	10,997	11,118	10,757	11,694	12,361	13,080	13,715	14,144	14,525	15,073	15,424	15,686	16,002	16,356	-1.2	2.1	3.4
39	SCE	1,369	1,691	2,662	2,502	2,465	2,535	2,673	2,804	3,030	2,987	2,903	2,794	2,774	2,733	2,693	2,656	6.9	-1.6	0.5
10	SDG&E	1	0	5	5	6	6	6	7	7	7	8	8	8	8	8	8	19.5	6.9	3.3
13	SDG&E	18	31	21	22	21	22	21	20	20	19	19	19	19	18	18	18	1.7	0.9	-1.8
14	SDG&E	93	52	48	48	47	46	49	54	51	50	51	51	51	51	51	51	-6.5	-1.1	1.0
15	SDG&E	5,416	6,036	9,717	10,167	9,336	9,331	9,327	9,217	9,316	9,176	8,841	8,600	8,447	8,280	8,110	7,974	6.0	-1.3	-1.6
203	SDG&E	143	232	187	177	179	174	169	168	166	164	162	161	158	157	155	154	2.7	-2.3	-1.3
206	SDG&E	15	11	7	8	8	8	8	8	9	9	9	11	11	12	12	13	-7.1	3.2	4.5
20x	SDG&E	560	791	1,171	1,180	1,253	1,287	1,323	1,383	1,433	1,489	1,543	1,607	1,651	1,698	1,744	1,786	7.7	3.2	3.3
22	SDG&E	33	70	101	90	86	81	80	81	84	86	88	91	92	94	96	97	11.8	-7.1	1.8
23	SDG&E	286	436	683	700	736	735	736	733	715	691	668	646	630	615	601	589	9.1	2.5	-2.2
24	SDG&E	174	103	115	100	97	90	90	92	95	93	90	89	89	87	86	85	-4.1	-7.8	-0.5
25	SDG&E	179	219	400	380	377	378	407	435	441	457	474	492	506	523	541	558	8.4	-1.9	4.0
261	SDG&E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
262	SDG&E	1	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3	3.5	-1.1	10.4
26X	SDG&E	88	122	187	173	166	166	177	193	200	209	218	227	234	242	249	257	7.8	-4.0	4.5
27	SDG&E	1,457	1,656	2,005	1,872	1,832	1,875	1,930	2,009	2,074	2,069	2,052	2,044	2,042	2,035	2,028	2,025	3.2	-2.2	0.8

Table F-3
Industrial Shipments by SIC and Planning Area
(Millions of 2001 $)

SIC	Planning Area	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	1990-2000	2000-2003	2003-2013
28	SDG&E	1,043	1,355	2,182	2,066	2,019	2,171	2,352	2,550	2,714	2,812	2,852	2,864	2,922	2,964	2,995	3,029	7.7	-0.2	3.4
29	SDG&E	73	94	134	122	123	126	128	134	136	127	117	108	105	103	98	95	6.3	-2.1	-2.8
308	SDG&E	320	523	574	547	537	537	555	585	617	613	604	589	585	577	570	564	6.0	-2.2	0.5
30X	SDG&E	43	105	150	148	147	145	151	160	171	174	177	177	179	180	181	183	13.4	-1.1	2.3
31	SDG&E	26	22	33	31	33	33	36	40	42	45	46	48	49	50	51	52	2.5	0.0	4.8
321	SDG&E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3.5	-3.3	13.1
324	SDG&E	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-7.7	-3.3	1.4
32X	SDG&E	334	271	240	219	215	212	213	216	216	211	210	209	205	201	198	195	-3.2	-4.0	-0.8
33	SDG&E	125	129	144	136	132	132	135	141	147	152	154	158	161	164	167	170	1.4	-2.9	2.6
34	SDG&E	679	658	998	967	973	999	1,047	1,112	1,160	1,186	1,194	1,197	1,207	1,216	1,221	1,225	3.9	0.0	2.1
357	SDG&E	536	2,453	21,918	18,765	12,511	13,049	12,894	13,340	13,171	14,097	16,116	18,657	19,776	21,302	23,035	24,767	44.9	-15.9	6.6
35X	SDG&E	1,042	1,291	3,039	3,252	2,772	2,562	2,598	2,707	2,735	2,820	2,894	2,918	2,924	2,943	2,969	2,995	11.3	-5.5	1.6
366	SDG&E	301	563	1,126	1,061	905	944	976	1,014	1,047	1,071	1,111	1,163	1,185	1,209	1,236	1,261	14.1	-5.7	2.9
367	SDG&E	983	1,356	2,461	2,082	1,510	1,755	1,982	2,194	2,352	2,497	2,926	3,331	3,593	3,890	4,215	4,518	9.6	-10.7	9.9
36X	SDG&E	943	1,227	622	572	512	485	500	523	542	552	571	579	583	587	590	595	-4.1	-8.0	2.1
37	SDG&E	3,837	2,352	1,975	1,940	1,557	1,518	1,569	1,697	1,863	1,997	2,106	2,230	2,368	2,478	2,578	2,671	-6.4	-8.4	5.8
38	SDG&E	2,916	3,106	3,868	3,921	3,789	4,072	4,270	4,484	4,677	4,802	4,913	5,066	5,162	5,231	5,317	5,415	2.9	1.7	2.9
39	SDG&E	412	800	1,425	1,358	1,367	1,432	1,530	1,621	1,769	1,773	1,752	1,704	1,710	1,704	1,696	1,686	13.2	0.2	1.6
10	SMUD	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
13	SMUD	49	34	23	26	26	26	25	24	23	22	22	22	21	21	20	20	-7.3	4.5	-2.7
14	SMUD	26	23	31	32	31	31	33	36	35	35	35	36	36	36	37	37	1.8	-0.1	1.8
15	SMUD	2,737	2,461	3,402	3,411	3,018	2,935	2,882	2,776	2,736	2,635	2,490	2,388	2,308	2,230	2,157	2,096	2.2	-4.8	-3.3
203	SMUD	390	449	499	472	477	462	447	440	431	424	412	401	392	384	376	369	2.5	-2.5	-2.2
206	SMUD	96	69	57	52	52	49	46	45	43	41	39	38	36	35	34	33	-5.2	-4.4	-3.9
20x	SMUD	652	644	1,484	1,490	1,566	1,606	1,648	1,717	1,777	1,855	1,924	1,990	2,044	2,102	2,156	2,205	8.6	2.7	3.2
22	SMUD	17	4	27	26	27	26	27	27	29	30	32	33	35	36	37	38	4.7	-1.3	4.0
23	SMUD	51	52	64	62	64	62	62	62	60	58	56	54	52	51	50	49	2.3	-0.7	-2.4
24	SMUD	310	179	186	164	156	142	140	143	146	143	138	135	133	131	128	126	-5.0	-8.6	-1.2
25	SMUD	61	60	77	72	69	67	70	73	73	74	75	76	77	78	80	81	2.3	-4.6	2.0
261	SMUD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
262	SMUD	1	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	1.2	6.6	4.0
26X	SMUD	116	115	136	124	117	114	120	129	131	134	138	141	143	146	149	151	1.7	-5.9	2.9
27	SMUD	553	489	543	498	484	490	497	510	520	513	503	495	490	484	478	474	-0.2	-3.4	-0.3
28	SMUD	299	160	178	163	154	160	169	180	188	195	197	199	202	205	207	209	-5.0	-3.6	2.7
29	SMUD	23	21	22	17	17	17	18	18	19	17	16	15	14	14	13	13	-0.5	-7.4	-3.2
308	SMUD	53	80	110	105	104	105	110	117	123	123	122	120	119	118	117	117	7.6	-1.3	1.0
30X	SMUD	5	7	34	34	34	34	36	39	41	42	42	42	43	43	43	43	21.0	0.0	2.4
31	SMUD	1	0	1	1	1	1	1	1	2	2	2	2	2	2	2	2	0.1	4.5	2.7
321	SMUD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
324	SMUD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
32X	SMUD	93	88	103	93	89	87	86	87	87	85	84	83	81	79	78	76	0.9	-5.5	-1.3
33	SMUD	15	34	29	27	27	27	28	30	31	32	33	34	35	36	37	37	6.9	-1.7	3.2
34	SMUD	235	220	211	196	186	181	178	179	178	173	167	160	155	151	147	143	-1.1	-5.1	-2.3
357	SMUD	23	1,727	15,657	13,404	8,923	9,310	9,097	9,269	9,138	9,747	11,080	12,271	12,866	13,681	14,578	15,416	92.3	-15.9	5.2
35X	SMUD	112	135	232	223	190	180	187	198	205	215	224	234	239	245	252	258	7.6	-8.1	3.7
366	SMUD	88	23	19	16	12	11	11	10	9	9	8	8	8	7	7	7	-14.4	-15.3	-4.8
367	SMUD	52	177	555	483	357	423	486	553	610	666	798	924	1,016	1,120	1,232	1,339	26.7	-8.7	12.2
36X	SMUD	76	157	221	205	189	183	193	206	219	230	242	249	256	262	267	273	11.2	-6.1	4.1
37	SMUD	551	397	393	375	272	244	242	254	273	286	294	302	315	323	330	336	-3.3	-14.7	3.3
38	SMUD	42	94	198	207	205	225	239	256	270	283	295	308	318	326	336	345	16.7	4.2	4.4
39	SMUD	31	48	79	74	73	76	80	84	91	92	90	89	90	90	90	90	9.8	-1.5	1.7

Table F-3
Industrial Shipments by SIC and Planning Area
(Millions of 2001 $)

SIC	Planning Area	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	1990-2000	2000-2003	2003-2013
10	STATE	333	603	569	607	619	628	678	752	720	729	750	764	775	784	793	801	5.5	3.4	2.5
13	STATE	5,526	6,352	4,285	5,129	4,970	5,070	5,167	5,265	5,362	5,460	5,607	5,619	5,627	5,634	5,642	5,650	-2.5	5.8	1.1
14	STATE	1,234	1,199	1,250	1,259	1,209	1,203	1,292	1,407	1,334	1,335	1,347	1,350	1,351	1,347	1,343	1,338	0.1	-1.3	1.1
15	STATE	65,930	62,780	98,469	101,763	93,236	94,057	95,704	96,002	98,076	97,749	95,301	93,953	93,167	92,183	91,091	90,303	4.1	-1.5	-0.4
203	STATE	10,456	10,116	10,325	10,251	10,762	10,965	11,115	11,468	11,670	11,965	12,220	12,532	12,697	12,889	13,068	13,218	-0.1	2.0	1.9
206	STATE	2,281	2,094	2,404	2,389	2,528	2,579	2,614	2,694	2,746	2,820	2,885	2,963	3,006	3,054	3,100	3,138	0.5	2.4	2.0
20x	STATE	30,685	33,460	41,622	41,523	43,324	44,214	44,961	46,734	47,949	49,488	50,767	52,175	53,178	54,277	55,320	56,257	3.1	2.0	2.4
22	STATE	1,773	2,461	4,761	4,349	4,269	4,152	4,190	4,330	4,528	4,694	4,904	5,134	5,282	5,440	5,582	5,733	10.4	-4.5	3.3
23	STATE	9,456	12,322	17,890	18,646	19,876	20,191	20,468	20,682	20,388	19,900	19,377	18,903	18,560	18,242	17,924	17,668	6.6	4.1	-1.3
24	STATE	8,165	6,437	7,696	7,037	6,989	6,608	6,725	7,071	7,417	7,490	7,362	7,400	7,445	7,452	7,439	7,456	-0.6	-5.0	1.2
25	STATE	4,951	4,771	6,654	6,275	6,151	6,123	6,533	6,923	6,935	7,099	7,250	7,448	7,574	7,759	7,940	8,128	3.0	-2.7	2.9
261	STATE	173	79	51	47	45	43	45	47	45	45	44	42	41	40	38	37	-11.4	-5.5	-1.7
262	STATE	655	683	537	492	480	473	499	543	554	558	567	580	583	585	589	592	-2.0	-4.1	2.3
26X	STATE	6,678	6,927	7,240	6,674	6,388	6,343	6,724	7,287	7,484	7,685	7,871	8,113	8,265	8,427	8,600	8,780	0.8	-4.3	3.3
27	STATE	18,769	17,548	19,460	18,209	17,880	18,356	18,856	19,573	20,168	20,060	19,805	19,647	19,575	19,452	19,331	19,254	0.4	-1.9	0.5
28	STATE	18,820	20,776	27,680	26,460	26,089	28,200	30,852	33,738	36,071	37,608	38,421	38,870	39,858	40,650	41,279	41,941	3.9	0.6	4.0
29	STATE	33,219	28,224	27,444	26,103	26,469	27,104	27,383	28,737	29,196	27,202	25,631	22,959	22,161	21,502	20,487	19,576	-1.9	-0.4	-3.2
308	STATE	8,066	8,575	9,963	9,532	9,501	9,636	10,070	10,687	11,279	11,249	11,108	10,879	10,831	10,708	10,594	10,514	2.1	-1.1	0.9
30X	STATE	1,363	1,602	1,881	1,829	1,807	1,800	1,878	1,992	2,109	2,130	2,130	2,117	2,124	2,120	2,115	2,114	3.3	-1.5	1.6
31	STATE	466	453	564	519	543	539	593	651	701	725	721	734	740	745	748	753	1.9	-1.5	3.4
321	STATE	151	175	224	208	205	205	209	214	217	215	215	214	211	207	204	200	4.0	-2.9	-0.2
324	STATE	510	514	733	683	684	690	709	740	757	760	772	785	783	781	780	779	3.7	-2.0	1.2
32X	STATE	5,960	5,136	6,679	6,255	6,231	6,292	6,480	6,715	6,873	6,872	6,960	7,056	7,036	7,010	7,000	6,990	1.1	-2.0	1.1
33	STATE	7,185	6,771	8,380	7,885	7,756	7,802	8,023	8,469	8,891	9,086	9,287	9,519	9,732	9,922	10,103	10,275	1.5	-2.4	2.8
34	STATE	15,935	15,662	18,608	17,699	17,694	18,090	18,934	20,028	20,667	20,896	20,810	20,622	20,604	20,586	20,510	20,425	1.6	-0.9	1.2
357	STATE	7,095	22,859	155,612	127,940	82,613	83,548	79,941	79,970	76,700	79,797	88,186	96,356	99,135	103,630	108,718	113,486	36.2	-18.7	3.1
35X	STATE	11,855	14,340	21,778	20,780	17,477	16,380	16,693	17,403	17,828	18,411	18,855	19,063	19,165	19,313	19,502	19,703	6.3	-9.1	1.9
366	STATE	4,397	7,915	17,883	16,857	14,720	15,460	16,203	17,040	17,759	18,223	18,952	19,874	20,326	20,779	21,281	21,763	15.1	-4.7	3.5
367	STATE	14,006	25,333	52,169	44,503	32,705	38,720	44,290	49,644	53,655	57,194	67,053	76,301	82,506	89,438	96,988	104,054	14.1	-9.5	10.4
36X	STATE	9,364	10,249	12,117	11,035	9,729	9,422	9,844	10,487	11,048	11,456	11,932	12,273	12,512	12,715	12,895	13,122	2.6	-8.0	3.4
37	STATE	52,632	31,801	31,459	29,261	21,987	20,778	21,206	22,704	24,613	26,123	27,310	28,642	30,164	31,338	32,386	33,345	-5.0	-12.9	4.8
38	STATE	29,022	26,694	33,708	34,650	33,872	37,015	39,323	41,795	43,952	45,507	46,900	48,763	50,019	50,992	52,125	53,375	1.5	3.2	3.7
39	STATE	3,312	4,348	6,668	6,262	6,192	6,379	6,742	7,078	7,644	7,575	7,393	7,148	7,115	7,034	6,953	6,875	7.2	-1.5	0.8

Table G-1
Average Retail Electricity Rates by Planning Area
(nominal cents per kWh)
PG&E

Year	Residential	Commercial	Small Commercial	Medium Commercial	Industrial	Agricultural
1980	4.80	5.42			4.02	5.11
1981	6.09	6.96			5.07	5.99
1982	6.23	6.97			5.44	6.43
1983	6.18	7.06			6.00	6.72
1984	7.59	8.61			7.43	7.84
1985	8.32	9.61			8.28	9.02
1986	8.47	9.76			7.82	9.09
1987	7.81	8.65			5.93	7.36
1988	8.65	8.72			5.73	7.41
1989	9.92	9.48			6.25	8.75
1990	10.59	9.96			6.42	8.90
1991	11.40	10.47			6.81	9.53
1992	11.98	11.09			7.21	9.99
1993	12.27	11.12			7.01	11.15
1994	12.49	11.25			7.02	10.73
1995	11.57	10.39			6.37	10.53
1996	12.10	10.18			6.92	10.71
1997	12.10	10.18			6.92	13.21
1998	11.00		12.20	9.60	6.92	13.21
1999	11.00		12.20	9.60	6.92	13.21
2000	11.00		12.20	9.60	6.90	13.21
2001	12.00		16.84	14.05	10.00	15.85
2002	12.33		19.06	14.03	11.97	19.32
2003	12.87		19.48	14.45	12.40	19.75
2004	11.04		15.85	10.90	7.86	14.27
2005	11.15		16.06	10.97	7.92	14.50
2006	11.17		16.11	10.90	7.84	14.56
2007	11.31		16.35	11.03	7.98	14.84
2008	10.62		15.86	10.44	8.10	15.09
2009	10.77		16.08	10.56	8.19	15.29
2010	10.68		15.92	10.37	7.96	15.09
2011	10.81		16.12	10.48	8.02	15.27
2012	10.90		16.25	10.52	8.02	15.37
2013	11.34		16.93	10.96	8.35	16.00

Table G-2
Average Retail Electricity Rates by Planning Area
(nominal cents per kWh)
SMUD

Year	Residential	Commercial	Small Commercial	Medium Commercial	Industrial	Agricultural
1980	2.65	2.54			1.58	
1981	2.97	2.80			1.73	
1982	3.52	2.50			2.26	
1983	4.01	3.58			2.59	
1984	4.23	3.73			2.70	
1985	4.92	4.41			3.21	
1986	5.99	5.18			3.94	
1987	7.26	6.29			4.85	
1988	8.05	7.00			5.34	
1989	7.99	7.13			5.98	
1990	8.21	8.63			7.04	
1991	8.19	8.73			7.09	
1992	8.20	8.48			7.13	
1993	7.66	7.98			6.62	
1994	8.01	8.12			6.98	
1995	8.15	8.49			6.97	
1996	8.29	8.24			6.96	
1997	7.72	8.24			7.51	
1998	7.72		7.91	7.68	7.51	
1999	7.72		7.91	7.68	7.51	
2000	7.72		7.91	7.68	7.51	
2001	9.02		10.50	9.52	8.12	
2002	8.99		10.25	9.27	7.87	9.30
2003	10.20		10.28	9.40	7.54	9.54
2004	10.35		10.42	9.51	7.58	9.66
2005	10.61		10.69	9.76	7.77	9.91
2006	11.14		11.22	10.24	8.16	10.40
2007	11.60		11.69	10.67	8.50	10.83
2008	11.97		12.06	11.01	8.77	11.18
2009	12.32		12.41	11.33	9.02	11.50
2010	12.69		12.79	11.67	9.30	11.85
2011	13.05		13.15	12.00	9.56	12.19
2012	13.48		13.58	12.40	9.87	12.59
2013	13.98		14.08	12.85	10.24	13.05

Table G-3
Average Retail Electricity Rates by Planning Area
(nominal cents per kWh)
SCE

Year	Residential	Commercial	Small Commercial	Medium Commercial	Industrial	Agricultural
1980	6.23	6.62			5.44	6.50
1981	6.70	7.02			5.73	6.17
1982	7.53	7.89			6.69	7.50
1983	7.33	7.99			6.92	7.68
1984	7.54	8.18			7.19	7.68
1985	7.81	8.52			7.44	8.04
1986	8.06	8.83			7.63	8.39
1987	8.17	8.84			7.48	8.28
1988	9.00	9.10			7.23	8.84
1989	10.10	9.73			7.38	9.39
1990	10.72	9.97			7.25	9.16
1991	11.64	10.59			7.50	9.60
1992	12.13	10.80			7.45	10.02
1993	12.11	10.30			6.98	10.38
1994	12.34	10.44			7.17	10.52
1995	12.88	10.42			7.19	10.98
1996	12.76	9.46			8.05	9.60
1997	12.76	9.45			8.05	10.05
1998	11.60		11.20	10.00	8.05	10.05
1999	11.60		11.20	10.00	8.05	10.05
2000	11.60		11.20	10.00	8.10	10.05
2001	13.29		19.04	15.04	12.13	13.21
2002	13.12		17.79	15.04	11.76	13.11
2003	13.46		18.69	15.78	12.19	13.54
2004	11.95		15.66	11.89	8.59	10.27
2005	11.77		15.21	11.50	8.16	9.94
2006	11.92		15.41	11.70	8.26	10.10
2007	12.04		15.60	11.90	8.39	10.27
2008	11.34		14.88	12.04	8.47	10.39
2009	11.47		15.06	12.18	8.55	10.50
2010	11.64		15.27	12.34	8.65	10.64
2011	11.63		15.22	12.26	8.54	10.57
2012	11.42		14.87	11.91	8.17	10.28
2013	11.90		15.51	12.42	8.52	10.71

Table G-4
Average Retail Electricity Rates by Planning Area
(nominal cents per kWh)
LADWP

Year	Residential	Commercial	Small Commercial	Medium Commercial	Industrial	Agricultural
1980	6.24	5.62			4.75	
1981	6.53	6.30			5.42	
1982	6.36	6.25			5.51	
1983	6.11	5.95			5.31	
1984	6.39	6.15			5.51	
1985	6.82	6.60			5.97	
1986	7.01	6.82			6.16	
1987	7.39	7.18			6.43	
1988	7.96	7.68			6.70	
1989	8.54	8.16			6.99	
1990	8.89	8.57			6.97	
1991	8.98	8.17			7.08	
1992	9.19	8.60			7.57	
1993	9.85	8.95			8.29	
1994	9.97	9.74			8.05	
1995	9.84	9.07			7.99	
1996	9.83	9.07			8.02	
1997	10.43	9.31			7.43	
1998	10.43		10.84	9.59	7.43	
1999	10.43		10.84	9.59	7.43	
2000	10.43		10.84	9.59	7.43	
2001	10.43		10.84	9.59	7.43	
2002	10.44		10.84	9.58	7.42	
2003	10.44		10.84	9.55	7.41	n/a
2004	10.28		10.68	9.41	7.30	n/a
2005	10.65		11.06	9.74	7.56	n/a
2006	11.28		11.72	10.32	8.01	n/a
2007	11.84		12.30	10.84	8.40	n/a
2008	12.35		12.84	11.31	8.77	n/a
2009	12.77		13.27	11.69	9.07	n/a
2010	13.29		13.81	12.16	9.43	n/a
2011	13.75		14.28	12.58	9.76	n/a
2012	14.27		14.83	13.06	10.13	n/a
2013	14.93		15.52	13.67	10.60	n/a

Table G-5
Average Retail Electricity Rates by Planning Area
(nominal cents per kWh)
SDG&E

Year	Residential	Commercial	Small Commercial	Medium Commercial	Industrial	Agricultural
1980	7.96	9.23			7.37	8.38
1981	8.95	10.12			8.32	8.80
1982	11.32	11.35			10.83	10.98
1983	11.75	11.65			11.42	11.41
1984	11.41	12.26			11.65	11.03
1985	12.40	13.36			12.70	12.12
1986	11.31	12.34			10.35	10.63
1987	10.60	10.68			8.90	8.72
1988	10.73	9.57			7.52	8.29
1989	10.82	8.96			7.11	7.36
1990	10.44	8.74			6.97	7.48
1991	10.52	8.93			7.09	7.62
1992	10.72	8.99			7.12	7.87
1993	11.09	9.52			7.21	8.55
1994	10.69	9.43			7.07	8.82
1995	10.63	9.46			7.03	8.65
1996	12.12	9.61			7.12	8.73
1997	12.12	10.33			7.12	8.73
1998	11.02		10.33	10.33	7.09	8.69
1999	10.70		11.26	9.61	8.12	10.68
2000	14.08		14.05	13.30	12.48	13.42
2001	13.83		17.48	12.85	10.46	12.75
2002	13.84		15.94	12.82	11.37	14.76
2003	14.00		17.09	13.19	12.47	15.79
2004	13.19		16.17	12.15	11.25	14.95
2005	13.28		16.26	12.24	11.31	15.13
2006	13.27		16.21	12.19	11.24	15.17
2007	13.40		16.37	12.38	11.40	15.41
2008	12.32		15.15	12.09	11.10	15.17
2009	12.48		15.32	12.21	11.21	15.35
2010	12.71		15.60	12.44	11.41	15.63
2011	12.77		15.66	12.45	11.41	15.70
2012	12.58		15.34	12.09	11.04	15.40
2013	13.12		15.99	12.61	11.52	16.05

Table G-6
Average Retail Electricity Rates by Planning Area
(nominal cents per kWh)
BGP

Year	Residential	Commercial	Small Commercial	Medium Commercial	Industrial	Agricultural
1980	6.98	7.20			5.62	
1981	6.84	6.82			5.43	
1982	7.07	8.78			5.74	
1983	6.95	8.56			5.89	
1984	7.19	8.97			6.06	
1985	7.22	8.97			6.01	
1986	7.12	8.72			5.97	
1987	7.67	9.36			6.43	
1988	8.34	10.32			7.11	
1989	8.72	10.77			7.57	
1990	9.01	11.09			7.73	
1991	8.94	11.11			7.79	
1992	9.24	11.48			8.26	
1993	9.56	12.17			8.47	
1994	9.87	12.81			8.88	
1995	9.74	12.68			8.70	
1996	9.60	12.56			8.77	
1997	11.39	10.31			9.06	
1998	11.39		11.67	10.65	9.06	
1999	11.39		11.67	10.65	9.06	
2000	11.39		11.67	10.65	9.06	
2001	13.72		14.31	13.35	12.31	
2002	12.67		13.69	12.81	9.77	
2003	12.73		13.34	12.35	9.07	n/a
2004	12.75		13.25	12.26	9.08	n/a
2005	12.97		13.58	12.57	9.24	n/a
2006	13.60		14.28	13.20	9.64	n/a
2007	14.11		14.86	13.72	9.95	n/a
2008	14.56		15.36	14.17	10.23	n/a
2009	14.93		15.76	14.53	10.47	n/a
2010	15.37		16.25	14.97	10.74	n/a
2011	15.76		16.68	15.35	10.99	n/a
2012	16.21		17.17	15.80	11.28	n/a
2013	16.77		17.80	16.36	11.61	n/a

Table G-7
End Use Natural Gas Price Forecast
PG&E
Reference Case Price Forecast 02-21-03
2000 Dollars per MCF

Year	Res	Comm	Indust	Comm	Indust	TEOR	Cogen	EG	System PG&E
1990	6.73	6.64	5.87	3.80	4.13	3.08	3.82	3.82	4.89
1991	6.76	6.75	5.91	3.14	3.29	3.64	3.30	3.30	4.58
1992	6.50	7.10	5.29	3.04	2.43	2.86	3.01	3.01	4.14
1993	6.15	6.58	5.21	3.26	2.41	2.56	3.25	3.25	4.29
1994	6.40	6.62	5.10	3.16	2.15	2.14	2.43	2.43	3.87
1995	6.67	6.73	4.90	2.65	1.94	1.60	2.36	2.36	4.00
1996	6.02	6.01	4.94	3.41	2.42	2.10	2.48	2.48	4.04
1997	6.21	6.22	5.31	2.89	2.83	3.12	2.81	2.81	4.08
1998	6.18	7.45	4.33	3.32	2.66	2.47	2.63	2.63	4.14
1999	7.61	7.59	4.34	3.89	2.87	2.76	2.71	2.71	4.30
2000	8.96	8.95	6.53	6.08	5.31	5.15	5.24	5.23	6.40
2001	9.94	9.87	7.78	7.58	6.81	6.77	6.79	6.79	7.76
2002	6.75	6.68	4.49	4.06	3.24	3.22	3.22	3.22	4.42
2003	6.87	6.81	4.63	4.22	3.41	3.39	3.39	3.39	4.60
2004	6.99	6.93	4.74	4.32	3.51	3.50	3.49	3.49	4.71
2005	6.92	6.86	4.77	4.40	3.61	3.59	3.59	3.59	4.68
2006	7.01	6.95	4.87	4.50	3.70	3.70	3.68	3.68	4.74
2007	7.18	7.11	5.00	4.62	3.80	3.81	3.78	3.78	4.87
2008	7.13	7.07	5.02	4.65	3.85	3.86	3.83	3.83	4.88
2009	7.20	7.13	5.09	4.72	3.92	3.94	3.90	3.90	4.95
2010	7.27	7.21	5.17	4.79	3.99	4.02	3.97	3.97	5.03
2011	7.28	7.22	5.22	4.85	4.07	4.09	4.05	4.05	5.08
2012	7.30	7.24	5.27	4.91	4.14	4.16	4.12	4.12	5.14
2013	7.38	7.32	5.36	4.99	4.22	4.24	4.20	4.20	5.22
2014	7.36	7.30	5.40	5.05	4.30	4.31	4.28	4.28	5.27
2015	7.40	7.35	5.47	5.12	4.38	4.39	4.36	4.36	5.33
2016	7.46	7.40	5.54	5.19	4.46	4.47	4.44	4.44	5.41
2017	7.50	7.44	5.61	5.27	4.54	4.55	4.52	4.52	5.47
2018	7.54	7.48	5.68	5.34	4.63	4.63	4.61	4.61	5.54
2019	7.59	7.54	5.75	5.42	4.71	4.72	4.69	4.69	5.62
2020	7.66	7.60	5.83	5.51	4.80	4.81	4.78	4.78	5.70
2021	7.72	7.67	5.91	5.59	4.89	4.89	4.87	4.87	5.78
2022	7.79	7.73	5.99	5.68	4.98	4.98	4.96	4.96	5.87

Table G-8
End Use Natural Gas Price Forecast
SCG
Reference Case Price Forecast 02-21-03
2000 Dollars per MCF

	Core			Noncore					System
Year	Res	Comm	Indust	Comm	Indust	TEOR	Cogen	EG	Average
1990	6.71	7.10	6.28	4.48	3.98	3.54	3.85	3.85	4.75
1991	7.33	7.70	7.70	4.10	3.82	3.00	3.38	3.38	4.72
1992	7.56	8.00	7.21	5.64	4.23	3.18	3.29	3.29	5.21
1993	7.36	7.84	7.14	5.22	3.91	3.31	3.30	3.30	5.18
1994	7.25	7.54	7.01	3.48	3.08	2.60	2.77	2.77	4.90
1995	7.52	7.42	6.56	2.51	2.40	2.10	2.37	2.37	4.71
1996	7.08	6.46	5.54	2.95	2.80	2.56	3.09	3.09	4.78
1997	7.38	6.70	5.63	3.11	3.45	3.01	3.36	3.36	4.93
1998	7.34	6.00	5.05	2.95	3.06	2.92	2.96	2.96	4.78
1999	6.26	4.73	3.67	3.12	3.11	3.00	2.77	2.77	4.17
2000	8.46	6.91	5.16	5.18	5.18	5.12	5.04	5.04	6.10
2001	11.46	9.85	8.17	7.07	7.07	7.02	6.90	6.90	8.84
2002	6.69	5.18	3.60	3.43	3.43	3.38	3.22	3.22	4.34
2003	6.96	5.42	3.82	3.56	3.56	3.52	3.35	3.35	4.60
2004	6.94	5.44	3.89	3.63	3.63	3.60	3.43	3.43	4.58
2005	7.03	5.54	3.99	3.72	3.72	3.69	3.51	3.51	4.62
2006	7.02	5.58	4.07	3.80	3.80	3.77	3.61	3.61	4.68
2007	7.10	5.65	4.15	3.92	3.92	3.89	3.73	3.73	4.79
2008	7.14	5.71	4.23	4.01	4.01	3.98	3.82	3.82	4.86
2009	7.20	5.78	4.31	4.10	4.10	4.07	3.91	3.91	4.92
2010	7.24	5.84	4.39	4.18	4.18	4.15	3.99	3.99	5.00
2011	7.28	5.90	4.46	4.27	4.27	4.24	4.08	4.08	5.06
2012	7.41	6.03	4.59	4.36	4.36	4.33	4.17	4.17	5.17
2013	7.49	6.12	4.69	4.44	4.44	4.41	4.25	4.25	5.25
2014	7.59	6.22	4.79	4.53	4.53	4.50	4.34	4.34	5.34
2015	7.65	6.30	4.88	4.61	4.61	4.58	4.42	4.42	5.41
2016	7.72	6.38	4.98	4.69	4.69	4.67	4.50	4.50	5.49
2017	7.70	6.37	4.98	4.72	4.72	4.69	4.53	4.53	5.50
2018	7.88	6.55	5.17	4.86	4.86	4.83	4.67	4.67	5.66
2019	7.96	6.64	5.27	4.95	4.95	4.92	4.76	4.76	5.74
2020	8.02	6.72	5.36	5.03	5.03	5.00	4.83	4.83	5.82
2021	8.09	6.80	5.46	5.11	5.11	5.08	4.92	4.92	5.89
2022	8.16	6.88	5.55	5.19	5.19	5.16	5.00	5.00	5.97

Table G-9
End Use Natural Gas Price Forecast
SDG&E
Reference Case Price Forecast 02-21-03
2000 Dollars per MCF

Year	Res	Comm	Indust	Comm	Indust	TEOR	Cogen	EG	System Average
1990	6.74	6.71	6.39	4.63	4.63	-	3.89	3.89	5.06
1991	6.35	6.44	6.41	4.07	4.07	-	3.41	3.41	4.61
1992	6.77	6.99	7.08	4.22	4.22	-	3.36	3.36	4.94
1993	7.18	6.76	7.05	2.70	2.61	-	3.49	3.49	5.10
1994	7.22	5.79	6.33	3.77	4.08	-	3.19	3.19	5.00
1995	6.76	5.58	6.26	2.84	2.87	-	2.28	2.28	4.13
1996	6.83	5.91	6.70	3.29	2.94	-	2.66	2.66	4.56
1997	7.53	6.93	7.84	3.40	3.40	-	3.07	3.07	4.74
1998	7.37	6.28	7.28	2.79	2.79	-	2.78	2.78	4.39
1999	6.91	6.22	4.78	3.34	3.34	-	3.21	3.21	4.49
2000	8.61	8.08	6.48	5.53	5.53	-	5.02	5.02	6.23
2001	11.47	10.82	9.19	7.36	7.36	-	6.90	6.90	8.68
2002	6.98	6.32	4.68	3.79	3.79	-	3.27	3.27	4.54
2003	7.36	6.67	4.96	3.89	3.89	-	3.36	3.36	5.36
2004	7.26	6.61	4.97	3.92	3.92	-	3.45	3.45	5.51
2005	7.41	6.75	5.09	3.98	3.98	-	3.52	3.52	5.72
2006	7.34	6.70	5.12	4.06	4.06	-	3.62	3.62	5.63
2007	7.48	6.83	5.22	4.18	4.18	-	3.74	3.74	5.77
2008	7.62	6.96	5.33	4.29	4.29	-	3.84	3.84	5.86
2009	7.56	6.93	5.35	4.40	4.40	-	3.97	3.97	5.53
2010	7.47	6.87	5.36	4.46	4.46	-	4.05	4.05	5.54
2011	7.54	6.92	5.44	4.54	4.54	-	4.14	4.14	5.60
2012	7.74	7.11	5.60	4.64	4.65	-	4.19	4.19	5.75
2013	7.81	7.19	5.69	4.72	4.72	-	4.27	4.27	5.83
2014	7.93	7.30	5.79	4.81	4.81	-	4.36	4.36	5.93
2015	8.04	7.41	5.90	4.89	4.90	-	4.44	4.44	6.03
2016	8.09	7.47	5.98	4.97	4.97	-	4.52	4.52	6.10
2017	8.09	7.47	5.98	4.99	5.00	-	4.55	4.55	6.12
2018	8.28	7.66	6.17	5.14	5.14	-	4.69	4.69	6.29
2019	8.38	7.76	6.27	5.22	5.22	-	4.77	4.77	6.38
2020	8.43	7.82	6.35	5.30	5.30	-	4.83	4.83	6.44
2021	8.49	7.89	6.44	5.37	5.37	-	4.92	4.92	6.52
2022	8.55	7.96	6.52	5.45	5.45	-	5.00	5.00	6.60

Table H-1
Residential Electric Consumption Summary by End Use - All Housing Types
PG&E

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (GWh)
CENTRAL A/C	1980	3,270,580	608,667	0.1861	2,331.60	2,331.70	1,419.10
	1990	3,897,420	960,679	0.2465	1,695.80	1,465.90	1,629.10
	2001	4,422,094	1,273,020	0.2879	1,385.20	1,264.40	1,763.30
	2004	4,628,767	1,392,235	0.3008	1,343.20	1,258.50	1,870.00
	2007	4,812,082	1,505,079	0.3128	1,288.20	1,046.50	1,938.80
	2013	5,167,946	1,731,104	0.3350	1,189.70	1,047.20	2,059.40
ROOM A/C	1980	3,270,577	306,685	0.0938	557.20	496.20	170.90
	1990	3,897,423	333,977	0.0857	476.20	425.40	159.00
	2001	4,422,095	342,732	0.0775	440.60	417.40	151.00
	2004	4,628,767	347,234	0.0750	435.90	416.20	151.40
	2007	4,812,079	350,864	0.0729	433.10	415.40	151.90
	2013	5,167,944	357,538	0.0692	430.90	414.50	154.00
EVAP A/C	1980	3,270,577	328,436	0.1004	712.10	712.10	233.90
	1990	3,897,423	348,110	0.0893	715.30	715.30	249.00
	2001	4,422,095	360,842	0.0816	711.30	711.30	256.70
	2004	4,628,767	372,211	0.0804	709.60	709.60	264.10
	2007	4,812,079	382,749	0.0795	708.40	708.40	271.10
	2013	5,167,944	403,353	0.0781	706.60	706.60	285.00
SPACE HEAT	1980	3,270,580	279,928	0.0856	7,221.90	7,221.90	2,021.60
	1990	3,897,420	330,233	0.0847	4,668.30	2,743.60	1,541.60
	2001	4,422,094	388,670	0.0879	3,284.20	2,367.30	1,276.40
	2004	4,628,767	412,085	0.0890	3,021.10	2,296.60	1,245.00
	2007	4,812,082	431,626	0.0897	2,815.50	2,243.50	1,215.20
	2013	5,167,946	467,967	0.0906	2,527.80	2,167.50	1,182.90
FURNACE FAN	1980	3,270,577	1,614,201	0.4936	361.60	0.00	583.70
	1990	3,897,423	1,963,958	0.5039	361.10	0.00	709.10
	2001	4,422,095	2,310,689	0.5225	361.20	0.00	834.60
	2004	4,628,767	2,443,750	0.5280	361.20	0.00	882.70
	2007	4,812,079	2,562,668	0.5326	361.20	0.00	925.60
	2013	5,167,944	2,794,919	0.5408	361.20	0.00	1,009.40
HTWATR DISHWASH	1980	3,270,577	188,125	0.0575	1,079.20	0.00	203.00
	1990	3,897,423	259,309	0.0665	1,013.70	0.00	262.90
	2001	4,422,094	319,026	0.0721	963.00	0.00	307.20
	2004	4,628,766	341,017	0.0737	959.20	0.00	327.20
	2007	4,812,079	360,807	0.0750	959.90	0.00	346.30
	2013	5,167,944	399,024	0.0772	963.80	0.00	384.50
HTWATR CLTHWASH	1980	3,270,577	313,015	0.0957	1,376.70	0.00	430.80
	1990	3,897,423	386,130	0.0991	1,124.10	0.00	434.00
	2001	4,422,094	429,944	0.0972	1,097.60	0.00	472.10
	2004	4,628,766	448,367	0.0969	1,094.30	0.00	490.60
	2007	4,812,079	464,770	0.0966	1,094.80	0.00	508.70
	2013	5,167,944	496,602	0.0961	1,099.60	0.00	545.90
WATER HT(BASIC)	1980	3,270,577	365,103	0.1116	2,921.70	2,724.00	1,066.80
	1990	3,897,423	421,648	0.1082	2,333.60	2,086.90	984.10
	2001	4,422,094	464,887	0.1051	2,162.30	2,082.40	1,005.30
	2004	4,628,766	484,128	0.1046	2,152.80	2,086.90	1,042.30
	2007	4,812,079	500,936	0.1041	2,152.60	2,092.30	1,078.20
	2013	5,167,944	533,334	0.1032	2,160.20	2,094.80	1,152.10
REFRIG	1980	3,270,577	3,792,678	1.1596	1,379.30	1,337.60	5,232.70
	1990	3,897,423	4,682,701	1.2015	1,247.50	1,051.00	5,841.40
	2001	4,422,094	5,132,381	1.1606	1,067.60	884.70	5,481.30
	2004	4,628,766	5,333,473	1.1522	1,031.20	887.00	5,499.90
	2007	4,812,079	5,509,060	1.1448	1,001.00	889.40	5,516.30
	2013	5,167,944	5,851,675	1.1323	959.30	892.70	5,614.60

Table H-1
Residential Electric Consumption Summary by End Use - All Housing Types
PG&E

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (GWh)
FREEZER	1980	3,270,577	658,268	0.2013	1,346.20	1,237.90	885.90
	1990	3,897,423	861,327	0.2210	1,227.20	892.50	1,057.40
	2001	4,422,094	1,077,699	0.2437	1,072.10	892.50	1,155.30
	2004	4,628,766	1,154,911	0.2495	1,039.30	892.50	1,200.80
	2007	4,812,079	1,230,243	0.2557	1,012.70	892.50	1,246.00
	2013	5,167,944	1,384,944	0.2680	972.10	892.50	1,346.30
COLOR TV	1980	3,270,577	2,883,743	0.8817	416.10	316.00	1,200.70
	1990	3,897,423	3,782,748	0.9706	341.40	316.00	1,290.80
	2001	4,422,094	4,346,203	0.9828	328.90	316.00	1,428.30
	2004	4,628,766	4,558,350	0.9848	332.00	316.00	1,512.10
	2007	4,812,079	4,746,981	0.9865	338.20	316.00	1,606.50
	2013	5,167,944	5,111,450	0.9891	363.60	316.00	1,857.80
COOKING	1980	3,270,577	1,812,900	0.5543	695.30	695.30	1,261.10
	1990	3,897,423	2,429,274	0.6233	707.10	707.10	1,718.40
	2001	4,422,094	2,813,791	0.6363	732.80	732.80	2,061.80
	2004	4,628,766	2,956,339	0.6387	740.30	740.30	2,188.00
	2007	4,812,079	3,081,980	0.6405	748.00	748.00	2,305.10
	2013	5,167,944	3,324,729	0.6433	754.70	754.70	2,510.50
DISH WSH MOTOR	1980	3,270,577	1,623,858	0.4965	280.20	280.20	454.30
	1990	3,897,423	2,283,173	0.5858	270.80	256.80	618.40
	2001	4,422,094	2,927,533	0.6620	269.60	265.90	789.50
	2004	4,628,766	3,157,209	0.6821	270.70	268.00	854.70
	2007	4,812,079	3,365,577	0.6994	272.10	270.30	916.70
	2013	5,167,944	3,770,464	0.7296	273.70	271.80	1,031.20
CLOTHES DRYER	1980	3,270,577	1,746,662	0.5341	1,091.30	1,091.30	1,905.70
	1990	3,897,423	2,404,660	0.6170	1,109.70	1,109.70	2,668.30
	2001	4,422,094	2,834,028	0.6409	1,148.40	1,148.40	3,254.30
	2004	4,628,766	2,993,104	0.6466	1,159.30	1,159.30	3,469.10
	2007	4,812,079	3,136,372	0.6518	1,170.40	1,170.40	3,670.70
	2013	5,167,944	3,414,136	0.6606	1,179.70	1,179.70	4,028.30
SOLR WATER HEAT	1980	3,073,910	9,136	0.0030	730.20	636.10	6.70
	1990	3,641,850	14,931	0.0041	545.90	518.60	8.20
	2001	4,177,020	15,010	0.0036	541.00	523.70	8.10
	2004	4,368,567	15,097	0.0035	541.80	527.20	8.20
	2007	4,538,334	15,164	0.0033	542.60	530.70	8.20
	2013	4,867,953	15,292	0.0031	541.50	533.30	8.30
SOLR WATRHT PMP	1980	3,073,910	36,936	0.0120	472.50	472.50	17.50
	1990	3,641,850	50,985	0.0140	473.10	472.50	24.10
	2001	4,177,020	51,835	0.0124	472.50	472.50	24.50
	2004	4,368,567	52,322	0.0120	472.50	472.50	24.70
	2007	4,538,334	52,717	0.0116	472.50	472.50	24.90
	2013	4,867,953	53,473	0.0110	472.50	472.50	25.30
CLOTH WASH MTR	1980	3,270,577	2,716,933	0.8307	68.80	68.80	187.30
	1990	3,897,423	3,420,619	0.8777	70.20	70.20	241.10
	2001	4,422,094	3,951,895	0.8937	72.60	72.60	288.20
	2004	4,628,766	4,152,169	0.8970	73.40	73.40	305.60
	2007	4,812,079	4,332,354	0.9003	74.20	74.20	321.90
	2013	5,167,944	4,683,123	0.9062	75.00	75.00	350.60
WATER BED	1980	3,270,577	601,410	0.1839	1,524.60	1,484.70	917.00
	1990	3,897,423	695,040	0.1783	1,378.30	1,341.90	957.90
	2001	4,422,094	835,792	0.1890	1,365.50	1,341.90	1,141.50
	2004	4,628,766	886,692	0.1916	1,367.20	1,341.90	1,212.60
	2007	4,812,079	941,255	0.1956	1,369.30	1,341.90	1,289.10
	2013	5,167,944	1,062,893	0.2057	1,373.20	1,341.90	1,459.70

Table H-1
Residential Electric Consumption Summary by End Use - All Housing Types
PG&E

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (GWh)
MISCELLANEOUS	1980	3,270,577	3,270,577	1.0000	1,169.40	0.00	3,825.20
	1990	3,897,423	3,897,423	1.0000	1,494.00	0.00	5,821.80
	2001	4,422,094	4,422,094	1.0000	1,963.40	0.00	8,683.10
	2004	4,628,766	4,628,766	1.0000	1,773.70	0.00	8,211.30
	2007	4,812,079	4,812,079	1.0000	1,931.60	0.00	9,295.00
	2013	5,167,944	5,167,944	1.0000	2,208.80	0.00	11,417.00
POOL PUMP	1980	3,270,577	207,642	0.0635	3,520.10	3,038.10	731.00
	1990	3,897,423	256,389	0.0658	3,098.30	2,537.00	794.40
	2001	4,422,094	299,117	0.0676	2,820.40	2,533.00	843.70
	2004	4,628,766	314,988	0.0681	2,764.00	2,531.30	870.80
	2007	4,812,079	329,462	0.0685	2,717.90	2,529.50	895.40
	2013	5,167,944	357,910	0.0693	2,647.90	2,526.10	947.90
POOL WATER HEAT	1980	3,270,577	6,541	0.0020	2,625.00	2,625.00	17.20
	1990	3,897,423	7,794	0.0020	2,625.00	2,625.00	20.50
	2001	4,422,094	8,344	0.0019	2,625.00	2,625.00	21.90
	2004	4,628,766	8,561	0.0019	2,625.00	2,625.00	22.50
	2007	4,812,079	8,756	0.0018	2,625.00	2,625.00	23.00
	2013	5,167,944	9,137	0.0018	2,625.00	2,625.00	24.00
POOL PUMP(SOLR)	1980	3,270,576	103,023	0.0315	0.00	0.00	0.00
	1990	3,897,421	66,256	0.0170	0.00	0.00	0.00
	2001	4,422,096	74,913	0.0169	0.00	0.00	0.00
	2004	4,628,768	74,541	0.0161	0.00	0.00	0.00
	2007	4,812,079	74,204	0.0154	0.00	0.00	0.00
	2013	5,167,945	73,740	0.0143	0.00	0.00	0.00
TUB PUMP	1980	2,146,878	107,344	0.0500	1,004.80	1,004.80	107.90
	1990	2,549,156	206,482	0.0810	1,004.80	1,004.80	207.50
	2001	2,957,926	294,145	0.0994	1,004.80	1,004.80	295.60
	2004	3,108,751	324,793	0.1045	1,004.80	1,004.80	326.40
	2007	3,247,038	353,129	0.1088	1,004.80	1,004.80	354.80
	2013	3,519,346	409,001	0.1162	1,004.80	1,004.80	411.00
TUB WATER HEAT	1980	2,146,878	12,345	0.0058	499.80	499.80	6.20
	1990	2,549,156	61,180	0.0240	499.80	499.80	30.60
	2001	2,957,926	125,559	0.0425	499.80	499.80	62.80
	2004	3,108,751	147,585	0.0475	499.80	499.80	73.80
	2007	3,247,038	168,000	0.0517	499.80	499.80	84.00
	2013	3,519,346	208,231	0.0592	499.80	499.80	104.10

Table H-1
Residential Electric Consumption Summary by End Use - All Housing Types
SMUD

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (GWh)
CENTRAL A/C	1980	303,166	144,893	0.4779	1,695.30	1,695.30	245.60
	1990	396,134	254,092	0.6414	1,246.80	1,099.80	316.80
	2001	463,723	327,960	0.7072	1,114.70	1,028.30	365.60
	2004	487,469	352,426	0.7230	1,095.50	1,033.50	386.10
	2007	509,699	375,395	0.7365	1,061.60	865.10	398.50
	2013	553,902	420,913	0.7599	1,006.90	884.30	423.90
ROOM A/C	1980	303,166	85,187	0.2810	482.40	395.90	41.10
	1990	396,135	76,585	0.1933	451.90	397.30	34.60
	2001	463,722	75,725	0.1633	425.90	397.40	32.20
	2004	487,468	75,712	0.1553	422.90	397.50	32.00
	2007	509,698	75,671	0.1485	420.90	397.50	31.90
	2013	553,903	75,582	0.1365	422.00	397.70	31.90
EVAP A/C	1980	303,166	25,049	0.0826	401.20	401.20	10.00
	1990	396,135	18,586	0.0469	403.30	403.30	7.50
	2001	463,722	18,794	0.0405	403.30	403.30	7.60
	2004	487,468	19,145	0.0393	403.40	403.40	7.70
	2007	509,698	19,469	0.0382	403.40	403.40	7.90
	2013	553,903	20,114	0.0363	403.50	403.50	8.10
SPACE HEAT	1980	303,166	65,937	0.2175	7,924.00	7,924.00	522.50
	1990	396,134	108,679	0.2744	5,247.20	3,109.10	570.30
	2001	463,723	115,626	0.2494	4,745.10	2,939.60	548.60
	2004	487,469	118,735	0.2436	4,641.30	2,915.10	551.10
	2007	509,699	121,626	0.2386	4,548.30	2,893.50	553.20
	2013	553,902	127,379	0.2300	4,383.60	2,855.60	558.40
FURNACE FAN	1980	303,166	102,490	0.3381	314.80	0.00	32.30
	1990	396,135	154,724	0.3906	316.00	0.00	48.90
	2001	463,722	214,790	0.4632	316.20	0.00	67.90
	2004	487,468	235,014	0.4821	316.30	0.00	74.30
	2007	509,698	253,993	0.4983	316.30	0.00	80.30
	2013	553,903	291,687	0.5266	316.40	0.00	92.30
HTWATR DISHWASH	1980	303,166	45,749	0.1509	1,025.10	0.00	46.90
	1990	396,135	62,150	0.1569	934.60	0.00	58.10
	2001	463,722	81,695	0.1762	883.80	0.00	72.20
	2004	487,468	88,262	0.1811	881.70	0.00	77.80
	2007	509,698	94,461	0.1853	882.30	0.00	83.30
	2013	553,903	106,756	0.1927	886.00	0.00	94.60
HTWATR CLTHWASH	1980	303,166	65,313	0.2154	1,338.40	0.00	87.40
	1990	396,135	82,740	0.2089	1,068.10	0.00	88.40
	2001	463,722	99,685	0.2150	1,040.60	0.00	103.70
	2004	487,468	105,542	0.2165	1,040.40	0.00	109.80
	2007	509,698	111,015	0.2178	1,040.00	0.00	115.50
	2013	553,903	121,860	0.2200	1,043.50	0.00	127.20
WATER HT(BASIC)	1980	303,166	73,015	0.2408	2,795.20	2,610.60	204.10
	1990	396,135	87,163	0.2200	2,240.60	2,019.80	195.30
	2001	463,722	102,877	0.2219	2,087.10	2,024.40	214.70
	2004	487,468	108,648	0.2229	2,079.30	2,027.80	225.90
	2007	509,698	114,034	0.2237	2,078.70	2,031.10	237.00
	2013	553,903	124,713	0.2252	2,088.30	2,034.90	260.40
REFRIG	1980	303,166	371,447	1.2252	1,305.60	1,243.70	485.00
	1990	396,135	469,900	1.1862	1,167.00	978.20	548.50
	2001	463,722	533,071	1.1496	994.60	826.20	530.30
	2004	487,468	557,011	1.1427	960.80	828.50	535.30
	2007	509,698	579,211	1.1364	933.10	831.00	540.50
	2013	553,903	623,489	1.1256	894.70	833.90	557.70

Table H-1
Residential Electric Consumption Summary by End Use - All Housing Types
SMUD

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (GWh)
FREEZER	1980	303,166	57,972	0.1912	1,326.40	1,214.40	76.90
	1990	396,135	78,271	0.1976	1,196.00	875.50	93.60
	2001	463,722	104,482	0.2253	1,030.90	875.50	107.70
	2004	487,468	112,784	0.2314	1,000.60	875.50	112.80
	2007	509,698	120,794	0.2370	976.30	875.50	117.90
	2013	553,903	136,844	0.2471	940.20	875.50	128.70
COLOR TV	1980	303,166	259,857	0.8572	400.10	310.00	103.90
	1990	396,135	391,684	0.9888	326.60	310.00	128.10
	2001	463,722	461,115	0.9944	316.40	310.00	145.90
	2004	487,468	485,111	0.9952	317.70	310.00	154.30
	2007	509,698	507,564	0.9958	322.10	310.00	163.40
	2013	553,903	552,122	0.9968	342.10	310.00	188.80
COOKING	1980	303,166	189,842	0.6262	660.60	660.60	125.40
	1990	396,135	268,514	0.6778	660.80	660.80	177.40
	2001	463,722	324,089	0.6989	686.80	686.80	222.70
	2004	487,468	342,780	0.7032	693.80	693.80	237.80
	2007	509,698	360,258	0.7068	700.00	700.00	252.20
	2013	553,903	394,875	0.7129	706.30	706.30	278.90
DISH WSH MOTOR	1980	303,166	191,285	0.6310	261.10	261.10	49.90
	1990	396,135	281,850	0.7115	247.10	235.90	69.60
	2001	463,722	363,927	0.7848	248.00	244.40	90.30
	2004	487,468	390,549	0.8012	249.70	246.80	97.40
	2007	509,698	415,636	0.8155	250.60	249.30	104.20
	2013	553,903	465,254	0.8400	252.40	251.10	117.40
CLOTHES DRYER	1980	303,166	208,418	0.6875	1,048.00	1,048.00	218.40
	1990	396,135	328,917	0.8303	1,037.60	1,037.60	341.30
	2001	463,722	382,673	0.8252	1,076.50	1,076.50	411.90
	2004	487,468	401,363	0.8234	1,086.40	1,086.40	435.90
	2007	509,698	418,580	0.8212	1,095.60	1,095.60	458.60
	2013	553,903	452,334	0.8166	1,104.10	1,104.10	499.40
SOLR WATER HEAT	1980	289,001	491	0.0017	649.80	599.30	0.30
	1990	378,655	1,054	0.0028	481.70	471.40	0.50
	2001	446,769	1,904	0.0043	477.30	474.50	0.90
	2004	468,837	2,163	0.0046	478.50	476.60	1.00
	2007	489,495	2,411	0.0049	479.40	477.90	1.20
	2013	530,585	2,907	0.0055	480.20	479.20	1.40
SOLR WATRHT PMP	1980	289,001	1,389	0.0048	463.50	463.50	0.60
	1990	378,655	4,635	0.0122	333.30	278.10	1.50
	2001	446,769	7,686	0.0172	299.40	278.10	2.30
	2004	468,837	8,625	0.0184	293.60	278.10	2.50
	2007	489,495	9,579	0.0196	289.00	278.10	2.80
	2013	530,585	11,569	0.0218	283.50	278.10	3.30
CLOTH WASH MTR	1980	303,166	270,003	0.8906	65.40	65.40	17.60
	1990	396,135	373,274	0.9423	65.80	65.80	24.40
	2001	463,722	442,360	0.9539	67.70	67.70	30.10
	2004	487,468	465,452	0.9548	68.50	68.50	31.90
	2007	509,698	487,048	0.9556	69.30	69.30	33.70
	2013	553,903	529,924	0.9567	69.40	69.40	36.90
WATER BED	1980	303,166	55,101	0.1818	1,498.20	1,455.70	82.50
	1990	396,135	86,864	0.2193	1,367.30	1,315.50	118.80
	2001	463,722	115,883	0.2499	1,326.30	1,315.60	153.70
	2004	487,468	124,679	0.2558	1,325.10	1,315.60	165.20
	2007	509,698	133,169	0.2613	1,326.10	1,315.60	176.60
	2013	553,903	150,234	0.2712	1,334.40	1,315.60	200.50

Table H-1
Residential Electric Consumption Summary by End Use - All Housing Types
SMUD

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (GWh)
MISCELLANEOUS	1980	303,166	303,166	1.0000	1,285.80	0.00	389.80
	1990	396,135	396,135	1.0000	1,544.00	0.00	611.80
	2001	463,722	463,722	1.0000	1,601.00	0.00	742.30
	2004	487,468	487,468	1.0000	1,424.10	0.00	694.30
	2007	509,698	509,698	1.0000	1,529.00	0.00	779.40
	2013	553,903	553,903	1.0000	1,734.00	0.00	960.60
POOL PUMP	1980	303,166	25,721	0.0848	3,388.20	2,897.40	87.20
	1990	396,135	49,364	0.1246	2,755.90	2,442.00	136.10
	2001	463,722	65,291	0.1408	2,569.90	2,436.10	167.80
	2004	487,468	70,044	0.1437	2,539.90	2,435.00	177.90
	2007	509,698	74,602	0.1464	2,517.00	2,434.00	187.80
	2013	553,903	83,569	0.1509	2,484.30	2,432.20	207.60
POOL WATER HEAT	1980	303,166	1,516	0.0050	3,541.10	3,541.10	5.40
	1990	396,135	2,850	0.0072	3,541.10	3,541.10	10.10
	2001	463,722	4,011	0.0087	3,541.10	3,541.10	14.20
	2004	487,468	4,398	0.0090	3,541.10	3,541.10	15.60
	2007	509,698	4,768	0.0094	3,541.10	3,541.10	16.90
	2013	553,903	5,516	0.0100	3,541.10	3,541.10	19.50
POOL PUMP(SOLR)	1980	303,167	13,491	0.0445	0.00	0.00	0.00
	1990	396,134	11,641	0.0294	0.00	0.00	0.00
	2001	463,722	15,607	0.0337	0.00	0.00	0.00
	2004	487,468	16,476	0.0338	0.00	0.00	0.00
	2007	509,698	17,343	0.0340	0.00	0.00	0.00
	2013	553,903	19,132	0.0345	0.00	0.00	0.00
TUB PUMP	1980	202,659	19,861	0.0980	985.70	985.70	19.60
	1990	269,090	38,899	0.1446	985.70	985.70	38.30
	2001	328,058	56,787	0.1731	985.70	985.70	56.00
	2004	346,639	62,243	0.1796	985.70	985.70	61.40
	2007	364,068	67,554	0.1856	985.70	985.70	66.60
	2013	398,750	78,347	0.1965	985.70	985.70	77.20
TUB WATER HEAT	1980	202,659	11,653	0.0575	490.30	490.30	5.70
	1990	269,090	22,755	0.0846	490.30	490.30	11.20
	2001	328,058	30,920	0.0943	490.30	490.30	15.20
	2004	346,639	33,428	0.0964	490.30	490.30	16.40
	2007	364,068	35,791	0.0983	490.30	490.30	17.50
	2013	398,750	40,503	0.1016	490.30	490.30	19.90

Table H-1
Residential Electric Consumption Summary by End Use - All Housing Types
SCE

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (GWh)
CENTRAL A/C	1980	2,990,440	609,058	0.2037	1,776.90	1,776.90	1,082.20
	1990	3,683,748	1,186,442	0.3221	1,350.10	1,205.50	1,601.80
	2001	4,080,521	1,619,480	0.3969	1,154.50	1,067.50	1,869.70
	2004	4,247,007	1,784,927	0.4203	1,124.80	1,063.80	2,007.80
	2007	4,403,767	1,948,795	0.4425	1,080.90	885.30	2,106.50
	2013	4,768,591	2,321,407	0.4868	990.30	879.70	2,298.80
ROOM A/C	1980	2,990,438	635,040	0.2124	508.90	419.90	323.20
	1990	3,683,744	562,013	0.1526	462.50	412.10	259.90
	2001	4,080,522	575,574	0.1411	434.50	410.50	250.00
	2004	4,247,004	577,826	0.1361	431.40	411.10	249.30
	2007	4,403,765	579,066	0.1315	430.40	411.90	249.20
	2013	4,768,589	581,425	0.1219	433.10	413.90	251.60
EVAP A/C	1980	2,990,438	308,000	0.1030	674.20	674.20	207.60
	1990	3,683,744	292,208	0.0793	772.60	772.60	225.80
	2001	4,080,522	313,949	0.0769	777.30	777.30	244.00
	2004	4,247,004	326,384	0.0769	779.10	779.10	254.30
	2007	4,403,765	338,352	0.0768	781.00	781.00	264.20
	2013	4,768,589	365,210	0.0766	784.00	784.00	286.30
SPACE HEAT	1980	2,990,440	275,121	0.0920	4,201.50	4,199.30	1,155.30
	1990	3,683,748	404,265	0.1097	2,375.40	1,466.60	960.30
	2001	4,080,521	456,328	0.1118	1,751.50	1,327.70	799.20
	2004	4,247,007	477,859	0.1125	1,639.90	1,303.90	783.60
	2007	4,403,767	498,035	0.1131	1,553.10	1,286.40	773.40
	2013	4,768,591	544,909	0.1143	1,419.30	1,251.80	773.30
FURNACE FAN	1980	2,990,438	1,064,640	0.3560	253.90	0.00	270.40
	1990	3,683,744	1,032,039	0.2802	254.00	0.00	262.20
	2001	4,080,522	997,454	0.2445	254.10	0.00	253.40
	2004	4,247,004	988,244	0.2327	254.10	0.00	251.10
	2007	4,403,765	979,131	0.2223	254.10	0.00	248.80
	2013	4,768,589	961,179	0.2016	254.20	0.00	244.30
HTWATR DISHWASH	1980	2,990,438	128,374	0.0429	1,049.50	0.00	134.70
	1990	3,683,744	250,700	0.0681	913.60	0.00	229.10
	2001	4,080,522	306,666	0.0752	889.80	0.00	272.80
	2004	4,247,004	326,486	0.0769	888.90	0.00	290.20
	2007	4,403,765	344,953	0.0783	891.50	0.00	307.60
	2013	4,768,589	385,942	0.0809	898.30	0.00	346.70
HTWATR CLTHWASH	1980	2,990,438	202,620	0.0678	1,402.80	0.00	284.30
	1990	3,683,744	335,570	0.0911	1,086.70	0.00	364.50
	2001	4,080,522	374,016	0.0917	1,079.00	0.00	403.70
	2004	4,247,004	389,397	0.0917	1,078.40	0.00	420.10
	2007	4,403,765	403,628	0.0917	1,081.80	0.00	436.70
	2013	4,768,589	436,457	0.0915	1,090.60	0.00	475.90
WATER HT(BASIC)	1980	2,990,438	255,989	0.0856	2,959.50	2,766.90	757.60
	1990	3,683,744	389,177	0.1057	2,376.10	2,188.50	924.50
	2001	4,080,522	424,665	0.1041	2,256.60	2,197.00	958.30
	2004	4,247,004	439,878	0.1036	2,252.40	2,202.00	990.80
	2007	4,403,765	453,861	0.1031	2,256.60	2,207.30	1,024.20
	2013	4,768,589	486,951	0.1021	2,269.70	2,207.30	1,105.30
REFRIG	1980	2,990,438	3,412,931	1.1413	1,576.80	1,521.10	5,382.30
	1990	3,683,744	4,347,231	1.1801	1,412.00	1,192.80	6,137.90
	2001	4,080,522	4,685,073	1.1482	1,219.20	1,004.80	5,713.80
	2004	4,247,004	4,853,025	1.1427	1,178.10	1,007.80	5,718.10
	2007	4,403,765	5,009,854	1.1376	1,144.10	1,010.00	5,732.20
	2013	4,768,589	5,386,684	1.1296	1,094.20	1,012.30	5,893.20

Table H-1
Residential Electric Consumption Summary by End Use - All Housing Types
SCE

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (GWh)
FREEZER	1980	718,313	128,229	0.1785	1,348.70	1,237.90	173.00
	1990	946,084	186,745	0.1974	1,205.70	886.20	225.10
	2001	4,080,522	857,596	0.2102	1,120.90	945.30	961.50
	2004	4,247,004	918,617	0.2163	1,090.80	945.30	1,001.80
	2007	4,403,765	980,587	0.2227	1,064.60	945.30	1,044.00
	2013	4,768,589	1,120,042	0.2349	1,023.90	945.30	1,146.90
COLOR TV	1980	2,990,438	2,648,809	0.8858	445.10	337.10	1,179.20
	1990	3,683,744	3,622,440	0.9834	361.70	337.10	1,311.10
	2001	4,080,522	4,035,772	0.9890	350.40	337.10	1,412.60
	2004	4,247,004	4,204,295	0.9899	353.80	337.10	1,487.30
	2007	4,403,765	4,362,989	0.9907	362.10	337.10	1,577.90
	2013	4,768,589	4,729,707	0.9919	389.70	337.10	1,841.80
COOKING	1980	2,990,438	782,850	0.2618	784.50	784.50	613.90
	1990	3,683,744	1,047,624	0.2844	814.20	814.20	852.60
	2001	4,080,522	1,195,641	0.2930	855.80	855.80	1,023.40
	2004	4,247,004	1,248,061	0.2939	863.70	863.70	1,077.60
	2007	4,403,765	1,298,556	0.2949	871.90	871.90	1,132.20
	2013	4,768,589	1,412,965	0.2963	874.40	874.40	1,235.40
DISH WSH MOTOR	1980	2,990,438	1,508,509	0.5044	311.20	311.20	469.30
	1990	3,683,744	2,347,573	0.6373	308.50	294.90	724.60
	2001	4,080,522	2,925,289	0.7169	316.90	312.20	926.30
	2004	4,247,004	3,131,898	0.7374	318.40	315.40	997.20
	2007	4,403,765	3,327,886	0.7557	320.90	318.60	1,068.00
	2013	4,768,589	3,762,790	0.7891	321.00	319.60	1,208.90
CLOTHES DRYER	1980	2,990,438	760,133	0.2542	1,216.10	1,216.10	924.30
	1990	3,683,744	1,035,112	0.2810	1,251.70	1,251.70	1,295.20
	2001	4,080,522	1,235,088	0.3027	1,317.40	1,317.40	1,626.90
	2004	4,247,004	1,306,836	0.3077	1,328.70	1,328.70	1,736.20
	2007	4,403,765	1,376,241	0.3125	1,341.20	1,341.50	1,846.00
	2013	4,768,589	1,531,540	0.3212	1,345.30	1,345.30	2,060.40
SOLR WATER HEAT	1980	2,813,154	5,626	0.0020	600.00	525.90	3.40
	1990	3,466,906	14,903	0.0043	463.40	435.30	6.90
	2001	3,872,781	14,452	0.0037	452.90	438.90	6.60
	2004	4,027,083	14,321	0.0036	453.40	441.10	6.50
	2007	4,172,305	14,190	0.0034	454.50	444.10	6.50
	2013	4,510,797	13,934	0.0031	453.50	445.00	6.30
SOLR WATRHT PMP	1980	2,813,154	58,777	0.0209	504.00	504.00	29.60
	1990	3,466,906	107,156	0.0309	504.00	504.00	54.00
	2001	3,872,781	110,641	0.0286	504.00	504.00	55.80
	2004	4,027,083	112,191	0.0279	504.00	504.00	56.50
	2007	4,172,305	113,608	0.0272	504.00	504.00	57.30
	2013	4,510,797	117,113	0.0260	504.00	504.00	59.00
CLOTH WASH MTR	1980	2,990,438	2,535,531	0.8479	78.80	78.80	200.70
	1990	3,683,744	3,248,343	0.8818	83.00	83.00	269.40
	2001	4,080,522	3,695,816	0.9057	87.50	87.50	324.70
	2004	4,247,004	3,869,355	0.9111	88.30	88.30	343.20
	2007	4,403,765	4,032,992	0.9158	89.10	89.10	361.50
	2013	4,768,589	4,405,519	0.9239	90.00	90.00	396.10
WATER BED	1980	2,990,438	226,732	0.0758	1,617.20	1,582.20	366.70
	1990	3,683,744	406,308	0.1103	1,449.40	1,430.30	588.80
	2001	4,080,522	505,982	0.1240	1,442.50	1,430.50	729.70
	2004	4,247,004	541,982	0.1276	1,443.60	1,430.50	782.50
	2007	4,403,765	581,636	0.1321	1,445.50	1,430.40	840.80
	2013	4,768,589	677,184	0.1420	1,449.70	1,430.40	981.70

Table H-1
Residential Electric Consumption Summary by End Use - All Housing Types
SCE

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (GWh)
MISCELLANEOUS	1980	2,990,438	2,990,438	1.0000	1,438.20	0.00	4,301.40
	1990	3,683,744	3,683,744	1.0000	1,950.00	0.00	7,182.20
	2001	4,080,522	4,080,522	1.0000	1,904.10	0.00	7,768.40
	2004	4,247,004	4,247,004	1.0000	1,831.60	0.00	7,778.70
	2007	4,403,765	4,403,765	1.0000	1,992.30	0.00	8,772.00
	2013	4,768,589	4,768,589	1.0000	2,245.50	0.00	10,707.40
POOL PUMP	1980	2,990,438	235,072	0.0786	3,775.90	3,367.20	887.70
	1990	3,683,744	375,095	0.1018	3,172.20	2,668.60	1,189.80
	2001	4,080,522	475,514	0.1165	2,898.30	2,664.00	1,378.10
	2004	4,247,004	508,550	0.1197	2,850.50	2,663.00	1,449.30
	2007	4,403,765	541,221	0.1229	2,811.10	2,662.00	1,521.30
	2013	4,768,589	613,349	0.1286	2,753.80	2,660.30	1,689.10
POOL WATER HEAT	1980	2,990,438	2,991	0.0010	2,800.00	2,800.00	8.40
	1990	3,683,744	7,368	0.0020	2,800.00	2,800.00	20.60
	2001	4,080,522	6,120	0.0015	2,800.00	2,800.00	17.10
	2004	4,247,004	5,898	0.0014	2,800.00	2,800.00	16.50
	2007	4,403,765	5,685	0.0013	2,800.00	2,800.00	15.90
	2013	4,768,589	5,362	0.0011	2,800.00	2,800.00	15.00
POOL PUMP(SOLR)	1980	2,990,439	35,885	0.0120	0.00	0.00	0.00
	1990	3,683,745	73,675	0.0200	0.00	0.00	0.00
	2001	4,080,523	106,601	0.0261	0.00	0.00	0.00
	2004	4,247,003	115,675	0.0272	0.00	0.00	0.00
	2007	4,403,763	124,604	0.0283	0.00	0.00	0.00
	2013	4,768,588	143,607	0.0301	0.00	0.00	0.00
TUB PUMP	1980	1,991,621	156,342	0.0785	823.20	823.20	128.70
	1990	2,430,808	427,822	0.1760	823.20	823.20	352.20
	2001	2,747,873	602,970	0.2194	823.20	823.20	496.40
	2004	2,864,728	656,730	0.2293	823.20	823.20	540.60
	2007	2,976,743	710,411	0.2387	823.20	823.20	584.80
	2013	3,234,824	826,074	0.2554	823.20	823.20	680.00
TUB WATER HEAT	1980	1,991,621	32,862	0.0165	533.10	533.10	17.50
	1990	2,430,808	126,402	0.0520	533.10	533.10	67.40
	2001	2,747,873	167,729	0.0610	533.10	533.10	89.40
	2004	2,864,728	182,323	0.0636	533.10	533.10	97.20
	2007	2,976,743	196,405	0.0660	533.10	533.10	104.70
	2013	3,234,824	228,336	0.0706	533.10	533.10	121.70

Table H-1
Residential Electric Consumption Summary by End Use - All Housing Types
LADWP

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (GWh)
CENTRAL A/C	1980	1,141,082	182,032	0.1595	1,365.10	1,363.20	248.10
	1990	1,224,258	284,410	0.2323	1,026.40	885.40	291.70
	2001	1,283,140	326,591	0.2545	857.50	764.80	280.00
	2004	1,300,720	340,054	0.2614	831.90	759.20	282.90
	2007	1,318,565	353,654	0.2682	799.60	628.50	282.80
	2013	1,355,038	380,304	0.2807	746.00	623.40	283.70
ROOM A/C	1980	1,141,082	217,156	0.1903	482.30	398.70	104.70
	1990	1,224,260	251,056	0.2051	412.60	376.50	103.60
	2001	1,283,140	267,330	0.2083	379.30	364.50	101.40
	2004	1,300,720	270,475	0.2079	375.20	362.10	101.50
	2007	1,318,566	273,271	0.2073	372.70	359.90	101.80
	2013	1,355,037	278,249	0.2053	370.90	356.10	103.20
EVAP A/C	1980	1,141,082	39,517	0.0346	537.00	537.00	21.20
	1990	1,224,260	39,502	0.0323	506.50	506.50	20.00
	2001	1,283,140	41,871	0.0326	491.30	491.30	20.60
	2004	1,300,720	42,534	0.0327	488.60	488.60	20.80
	2007	1,318,566	43,205	0.0328	485.80	485.80	21.00
	2013	1,355,037	44,620	0.0329	480.30	480.30	21.40
SPACE HEAT	1980	1,141,082	111,664	0.0979	4,064.80	3,971.40	443.40
	1990	1,224,258	189,612	0.1549	2,681.00	1,536.10	490.80
	2001	1,283,140	235,990	0.1839	2,098.40	1,285.80	478.90
	2004	1,300,720	250,602	0.1927	1,984.10	1,237.20	481.30
	2007	1,318,565	265,238	0.2012	1,882.60	1,194.10	483.90
	2013	1,355,038	294,583	0.2174	1,711.20	1,121.30	489.40
FURNACE FAN	1980	1,141,082	294,821	0.2584	260.00	0.00	76.60
	1990	1,224,260	311,467	0.2544	264.70	0.00	82.40
	2001	1,283,140	325,622	0.2538	265.80	0.00	86.50
	2004	1,300,720	330,048	0.2537	266.30	0.00	87.90
	2007	1,318,566	334,582	0.2538	266.70	0.00	89.20
	2013	1,355,037	343,959	0.2538	267.70	0.00	92.10
HTWATR DISHWASH	1980	1,141,082	28,791	0.0252	1,027.30	0.00	29.60
	1990	1,224,260	45,156	0.0369	854.20	0.00	38.60
	2001	1,283,140	57,704	0.0450	811.70	0.00	46.80
	2004	1,300,720	61,423	0.0472	807.50	0.00	49.60
	2007	1,318,566	65,136	0.0494	806.30	0.00	52.50
	2013	1,355,037	72,534	0.0535	814.20	0.00	59.00
HTWATR CLTHWASH	1980	1,141,082	57,904	0.0507	1,345.30	0.00	77.90
	1990	1,224,260	78,976	0.0645	1,046.10	0.00	82.60
	2001	1,283,140	90,018	0.0702	1,011.00	0.00	91.00
	2004	1,300,720	93,449	0.0718	1,006.50	0.00	94.10
	2007	1,318,566	96,872	0.0735	1,005.80	0.00	97.50
	2013	1,355,037	103,644	0.0765	1,016.60	0.00	105.40
WATER HT(BASIC)	1980	1,141,082	76,723	0.0672	2,816.80	2,634.30	216.10
	1990	1,224,260	107,455	0.0878	2,192.70	1,999.70	235.60
	2001	1,283,140	116,047	0.0904	2,045.00	1,977.70	237.30
	2004	1,300,720	118,691	0.0913	2,034.30	1,978.70	241.40
	2007	1,318,566	121,354	0.0920	2,031.20	1,979.60	246.50
	2013	1,355,037	126,741	0.0935	2,049.60	1,985.30	259.70
REFRIG	1980	1,141,082	1,238,943	1.0858	1,413.30	1,437.40	1,751.20
	1990	1,224,260	1,384,448	1.1308	1,303.80	1,126.70	1,804.80
	2001	1,283,140	1,425,159	1.1107	1,140.60	947.50	1,625.50
	2004	1,300,720	1,439,837	1.1070	1,106.10	949.80	1,592.00
	2007	1,318,566	1,455,142	1.1036	1,076.50	951.50	1,566.70
	2013	1,355,037	1,487,496	1.0978	1,034.70	953.00	1,539.10

Table H-1
Residential Electric Consumption Summary by End Use - All Housing Types
LADWP

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (GWh)
FREEZER	1980	1,141,082	145,077	0.1271	1,389.10	1,273.30	201.50
	1990	1,224,260	166,185	0.1357	1,294.50	911.50	215.10
	2001	1,283,140	190,290	0.1483	1,143.70	911.50	217.60
	2004	1,300,720	197,460	0.1518	1,110.10	911.50	219.20
	2007	1,318,566	204,714	0.1553	1,080.60	911.50	221.20
	2013	1,355,037	219,063	0.1617	1,033.40	911.50	226.30
COLOR TV	1980	1,141,082	931,031	0.8159	453.30	325.10	422.20
	1990	1,224,260	1,151,764	0.9408	360.30	325.10	414.60
	2001	1,283,140	1,236,657	0.9638	349.20	325.10	432.00
	2004	1,300,720	1,260,327	0.9689	356.10	325.10	449.10
	2007	1,318,566	1,283,517	0.9734	367.80	325.10	472.50
	2013	1,355,037	1,328,646	0.9805	399.20	325.10	530.60
COOKING	1980	1,141,082	217,552	0.1907	699.70	699.70	152.20
	1990	1,224,260	228,692	0.1868	715.90	715.90	163.70
	2001	1,283,140	263,933	0.2057	738.50	738.50	194.90
	2004	1,300,720	273,455	0.2102	743.10	743.10	203.20
	2007	1,318,566	282,909	0.2146	747.80	747.80	211.50
	2013	1,355,037	301,638	0.2226	757.00	757.00	228.30
DISH WSH MOTOR	1980	1,141,082	457,965	0.4013	287.90	287.90	131.80
	1990	1,224,260	559,802	0.4573	302.90	285.20	169.70
	2001	1,283,140	676,596	0.5273	298.00	291.20	201.50
	2004	1,300,720	709,578	0.5455	297.20	292.20	210.80
	2007	1,318,566	742,284	0.5630	297.10	293.20	220.50
	2013	1,355,037	806,865	0.5955	298.30	295.60	241.00
CLOTHES DRYER	1980	1,141,082	261,749	0.2294	1,006.10	1,006.10	263.30
	1990	1,224,260	299,453	0.2446	1,079.10	1,079.10	323.10
	2001	1,283,140	337,892	0.2633	1,106.70	1,106.70	373.90
	2004	1,300,720	348,759	0.2681	1,112.10	1,112.10	387.80
	2007	1,318,566	359,612	0.2727	1,117.50	1,117.50	401.80
	2013	1,355,037	381,037	0.2812	1,128.70	1,128.70	430.00
SOLR WATER HEAT	1980	1,141,082	1,141	0.0010	558.20	483.80	0.60
	1990	1,224,260	5,076	0.0042	396.00	383.70	2.00
	2001	1,283,140	4,866	0.0038	386.80	381.80	1.90
	2004	1,300,720	4,798	0.0037	387.10	382.80	1.90
	2007	1,318,566	4,729	0.0036	387.30	383.50	1.80
	2013	1,355,037	4,598	0.0034	388.00	385.30	1.80
SOLR WATRHT PMP	1980	1,141,082	2,846	0.0025	486.00	486.00	1.40
	1990	1,224,260	28,874	0.0236	486.00	486.00	14.00
	2001	1,283,140	28,569	0.0223	486.00	486.00	13.90
	2004	1,300,720	28,431	0.0219	486.00	486.00	13.80
	2007	1,318,566	28,299	0.0215	486.00	486.00	13.80
	2013	1,355,037	28,054	0.0207	486.00	486.00	13.60
CLOTH WASH MTR	1980	1,141,082	878,372	0.7698	69.70	69.70	61.20
	1990	1,224,260	946,971	0.7735	77.90	77.90	74.00
	2001	1,283,140	1,042,854	0.8127	80.20	80.20	83.90
	2004	1,300,720	1,070,758	0.8232	80.60	80.60	86.60
	2007	1,318,566	1,098,266	0.8329	80.90	80.90	89.30
	2013	1,355,037	1,151,858	0.8501	82.20	82.20	94.50
WATER BED	1980	1,141,082	69,733	0.0611	1,568.20	1,527.10	109.40
	1990	1,224,260	48,675	0.0398	1,454.20	1,380.20	70.80
	2001	1,283,140	56,966	0.0444	1,415.20	1,380.20	80.60
	2004	1,300,720	59,589	0.0458	1,413.70	1,380.20	84.30
	2007	1,318,566	62,252	0.0472	1,414.00	1,380.20	88.10
	2013	1,355,037	67,452	0.0498	1,417.40	1,380.20	95.60

Table H-1
Residential Electric Consumption Summary by End Use - All Housing Types
LADWP

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (GWh)
MISCELLANEOUS	1980	1,141,082	1,141,082	1.0000	1,049.90	0.00	1,198.10
	1990	1,224,260	1,224,260	1.0000	1,691.20	0.00	2,070.50
	2001	1,283,140	1,283,140	1.0000	1,553.50	0.00	1,993.70
	2004	1,300,720	1,300,720	1.0000	1,499.00	0.00	1,949.70
	2007	1,318,566	1,318,566	1.0000	1,623.10	0.00	2,139.50
	2013	1,355,037	1,355,037	1.0000	1,857.40	0.00	2,516.70
POOL PUMP	1980	1,141,082	97,754	0.0857	3,674.90	3,408.20	359.20
	1990	1,224,260	153,293	0.1252	3,386.20	3,186.70	519.00
	2001	1,283,140	186,206	0.1451	3,271.20	3,183.90	609.00
	2004	1,300,720	194,984	0.1499	3,252.00	3,183.40	634.00
	2007	1,318,566	203,702	0.1545	3,236.70	3,183.00	659.30
	2013	1,355,037	220,957	0.1631	3,215.10	3,182.30	710.40
POOL WATER HEAT	1980	1,141,082	3,423	0.0030	2,700.00	2,700.00	9.20
	1990	1,224,260	1,224	0.0010	2,707.50	2,700.00	3.30
	2001	1,283,140	2,375	0.0019	2,700.00	2,700.00	6.40
	2004	1,300,720	2,706	0.0021	2,700.00	2,700.00	7.30
	2007	1,318,566	3,019	0.0023	2,700.00	2,700.00	8.10
	2013	1,355,037	3,592	0.0027	2,700.00	2,700.00	9.70
POOL PUMP(SOLR)	1980	1,141,081	21,110	0.0185	0.00	0.00	0.00
	1990	1,224,261	26,934	0.0220	0.00	0.00	0.00
	2001	1,283,140	34,908	0.0272	0.00	0.00	0.00
	2004	1,300,719	36,841	0.0283	0.00	0.00	0.00
	2007	1,318,566	38,739	0.0294	0.00	0.00	0.00
	2013	1,355,036	42,438	0.0313	0.00	0.00	0.00
TUB PUMP	1980	564,463	39,371	0.0698	793.80	793.80	31.30
	1990	567,437	77,739	0.1370	793.80	793.80	61.70
	2001	588,926	102,582	0.1742	793.80	793.80	81.40
	2004	594,848	109,228	0.1836	793.80	793.80	86.70
	2007	600,927	115,833	0.1928	793.80	793.80	91.90
	2013	613,528	128,919	0.2101	793.80	793.80	102.30
TUB WATER HEAT	1980	564,463	6,491	0.0115	514.10	514.10	3.30
	1990	567,437	21,563	0.0380	355.30	283.00	7.70
	2001	588,926	21,051	0.0358	325.10	283.00	6.80
	2004	594,848	20,906	0.0352	319.70	283.00	6.70
	2007	600,927	20,767	0.0346	314.30	283.00	6.50
	2013	613,528	20,505	0.0334	306.70	283.00	6.30

Table H-1
Residential Electric Consumption Summary by End Use - All Housing Types
SDG&E

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (GWh)
CENTRAL A/C	1980	718,313	72,690	0.1012	1,266.90	1,266.90	92.10
	1990	946,085	182,670	0.1931	925.00	841.10	168.90
	2001	1,095,144	280,660	0.2563	812.90	764.60	228.10
	2004	1,156,392	315,483	0.2728	797.70	765.50	251.70
	2007	1,208,123	347,118	0.2873	770.40	638.60	267.50
	2013	1,291,578	403,745	0.3126	717.60	640.80	289.80
ROOM A/C	1980	718,313	80,907	0.1126	321.10	264.20	26.00
	1990	946,084	117,833	0.1246	279.00	259.50	32.90
	2001	1,095,145	130,788	0.1194	263.60	257.30	34.50
	2004	1,156,391	135,422	0.1171	262.30	256.60	35.50
	2007	1,208,122	139,491	0.1155	260.60	256.00	36.40
	2013	1,291,576	146,389	0.1133	260.70	255.20	38.10
EVAP A/C	1980	718,313	13,746	0.0191	210.00	210.00	2.90
	1990	946,084	13,283	0.0140	210.00	210.00	2.80
	2001	1,095,145	13,531	0.0124	210.00	210.00	2.80
	2004	1,156,391	14,310	0.0124	210.00	210.00	3.00
	2007	1,208,122	14,980	0.0124	210.00	210.00	3.10
	2013	1,291,576	16,093	0.0125	210.00	210.00	3.40
SPACE HEAT	1980	718,313	105,198	0.1465	3,324.30	3,324.30	349.70
	1990	946,085	237,639	0.2512	1,306.80	863.50	310.50
	2001	1,095,144	271,562	0.2480	992.60	789.50	269.60
	2004	1,156,392	286,124	0.2474	937.20	773.90	268.10
	2007	1,208,123	298,349	0.2470	894.40	762.60	266.80
	2013	1,291,578	317,904	0.2461	837.40	748.60	266.20
FURNACE FAN	1980	718,313	277,816	0.3868	233.40	0.00	64.80
	1990	946,084	364,644	0.3854	234.00	0.00	85.30
	2001	1,095,145	457,425	0.4177	234.10	0.00	107.10
	2004	1,156,391	493,961	0.4272	234.10	0.00	115.60
	2007	1,208,122	525,038	0.4346	234.10	0.00	122.90
	2013	1,291,576	575,683	0.4457	234.00	0.00	134.70
HTWATR DISHWASH	1980	718,313	43,643	0.0608	1,005.70	0.00	43.90
	1990	946,084	74,769	0.0790	873.80	0.00	65.40
	2001	1,095,145	92,723	0.0847	837.30	0.00	77.70
	2004	1,156,391	99,213	0.0858	837.50	0.00	83.10
	2007	1,208,122	104,747	0.0867	840.70	0.00	88.10
	2013	1,291,576	113,792	0.0881	855.40	0.00	97.30
HTWATR CLTHWASH	1980	718,313	70,175	0.0977	1,303.20	0.00	91.40
	1990	946,084	104,442	0.1104	1,017.40	0.00	106.30
	2001	1,095,145	116,324	0.1062	998.60	0.00	116.20
	2004	1,156,391	121,437	0.1050	999.70	0.00	121.40
	2007	1,208,122	125,665	0.1040	1,003.70	0.00	126.10
	2013	1,291,576	132,262	0.1024	1,021.00	0.00	135.00
WATER HT(BASIC)	1980	718,313	79,458	0.1106	2,797.70	2,591.50	222.30
	1990	946,084	103,666	0.1096	2,239.00	2,040.20	232.10
	2001	1,095,145	114,762	0.1048	2,091.80	2,029.20	240.10
	2004	1,156,391	119,729	0.1035	2,090.80	2,035.80	250.40
	2007	1,208,122	123,860	0.1025	2,097.00	2,041.00	259.70
	2013	1,291,576	130,368	0.1009	2,129.60	2,052.80	277.60
REFRIG	1980	718,313	792,838	1.1038	1,425.30	1,329.90	1,130.30
	1990	946,084	1,071,005	1.1320	1,246.60	1,041.30	1,334.70
	2001	1,095,145	1,210,784	1.1056	1,061.30	876.60	1,285.40
	2004	1,156,391	1,272,035	1.1000	1,023.90	878.60	1,302.10
	2007	1,208,122	1,322,884	1.0950	992.60	880.60	1,313.40
	2013	1,291,576	1,402,958	1.0862	950.70	883.20	1,333.80

Table H-1
Residential Electric Consumption Summary by End Use - All Housing Types
SDG&E

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (GWh)
FREEZER	1980	718,313	128,229	0.1785	1,348.70	1,237.90	173.00
	1990	946,084	186,745	0.1974	1,205.70	886.20	225.10
	2001	1,095,145	243,695	0.2225	1,048.30	886.20	255.60
	2004	1,156,391	262,709	0.2272	1,018.80	886.20	267.60
	2007	1,208,122	281,780	0.2332	993.60	886.20	279.90
	2013	1,291,576	320,786	0.2484	955.50	886.20	306.60
COLOR TV	1980	718,313	624,062	0.8688	408.80	316.00	254.90
	1990	946,084	913,934	0.9660	335.00	316.00	306.60
	2001	1,095,145	1,073,215	0.9800	324.10	316.00	347.80
	2004	1,156,391	1,135,938	0.9823	325.90	316.00	370.00
	2007	1,208,122	1,189,182	0.9843	329.60	316.00	392.30
	2013	1,291,576	1,275,568	0.9876	349.40	316.00	446.10
COOKING	1980	718,313	312,698	0.4353	677.60	677.60	211.90
	1990	946,084	464,849	0.4913	687.30	687.30	319.40
	2001	1,095,145	560,990	0.5123	708.70	708.70	397.50
	2004	1,156,391	596,730	0.5160	715.60	715.60	427.20
	2007	1,208,122	628,193	0.5200	722.70	722.70	453.90
	2013	1,291,576	682,061	0.5281	734.40	734.40	500.90
DISH WSH MOTOR	1980	718,313	381,433	0.5310	277.20	277.20	105.60
	1990	946,084	638,982	0.6754	263.20	252.20	168.10
	2001	1,095,145	831,563	0.7593	263.00	259.90	218.90
	2004	1,156,391	901,175	0.7793	265.30	262.90	238.90
	2007	1,208,122	961,514	0.7959	267.10	265.40	256.70
	2013	1,291,576	1,062,330	0.8225	270.70	269.60	287.60
CLOTHES DRYER	1980	718,313	241,306	0.3359	1,130.20	1,130.20	272.80
	1990	946,084	399,865	0.4227	1,136.70	1,136.70	454.60
	2001	1,095,145	499,127	0.4558	1,178.80	1,178.80	588.30
	2004	1,156,391	536,518	0.4640	1,192.80	1,192.80	639.80
	2007	1,208,122	568,820	0.4708	1,204.60	1,204.60	685.20
	2013	1,291,576	622,506	0.4820	1,225.10	1,225.10	762.80
SOLR WATER HEAT	1980	671,922	4,305	0.0064	472.10	429.20	2.00
	1990	891,581	8,049	0.0090	391.10	371.20	3.10
	2001	1,041,552	8,000	0.0077	391.80	381.40	3.10
	2004	1,098,932	8,148	0.0074	394.20	385.70	3.20
	2007	1,147,376	8,243	0.0072	397.30	390.00	3.30
	2013	1,225,468	8,330	0.0068	402.30	397.40	3.40
SOLR WATRHT PMP	1980	671,922	16,824	0.0250	472.50	472.50	7.90
	1990	891,581	32,260	0.0362	384.60	283.50	12.40
	2001	1,041,552	38,835	0.0373	304.30	283.50	11.80
	2004	1,098,932	41,013	0.0373	300.00	283.50	12.30
	2007	1,147,376	43,150	0.0376	295.50	283.50	12.80
	2013	1,225,468	47,355	0.0386	291.10	283.50	13.80
CLOTH WASH MTR	1980	718,313	610,708	0.8502	68.80	68.80	42.00
	1990	946,084	888,431	0.9391	70.00	70.00	62.10
	2001	1,095,145	1,040,919	0.9505	72.20	72.20	75.10
	2004	1,156,391	1,101,236	0.9523	72.80	72.80	80.30
	2007	1,208,122	1,152,147	0.9537	73.40	73.40	84.90
	2013	1,291,576	1,234,132	0.9555	74.70	74.70	92.40
WATER BED	1980	718,313	70,339	0.0979	1,525.40	1,483.40	107.30
	1990	946,084	131,909	0.1394	1,379.30	1,340.70	182.00
	2001	1,095,145	178,126	0.1627	1,348.30	1,340.80	240.20
	2004	1,156,391	193,577	0.1674	1,347.20	1,340.90	260.80
	2007	1,208,122	208,561	0.1726	1,348.00	1,340.90	281.20
	2013	1,291,576	238,038	0.1843	1,354.30	1,340.90	322.40

Table H-1
Residential Electric Consumption Summary by End Use - All Housing Types
SDG&E

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (GWh)
MISCELLANEOUS	1980	718,313	718,313	1.0000	916.80	0.00	658.80
	1990	946,084	946,084	1.0000	1,304.50	0.00	1,234.20
	2001	1,095,145	1,095,145	1.0000	1,517.30	0.00	1,662.00
	2004	1,156,391	1,156,391	1.0000	1,502.60	0.00	1,737.30
	2007	1,208,122	1,208,122	1.0000	1,641.60	0.00	1,983.60
	2013	1,291,576	1,291,576	1.0000	1,933.90	0.00	2,497.50
POOL PUMP	1980	718,313	52,355	0.0729	3,608.70	3,597.40	188.90
	1990	946,084	87,742	0.0927	3,603.70	3,595.30	316.20
	2001	1,095,145	105,609	0.0964	3,602.20	3,597.80	380.40
	2004	1,156,391	112,032	0.0969	3,601.30	3,597.70	403.50
	2007	1,208,122	117,688	0.0974	3,600.50	3,597.50	423.70
	2013	1,291,576	127,481	0.0987	3,599.40	3,597.40	458.90
POOL WATER HEAT	1980	718,313	1,257	0.0018	2,625.00	2,625.00	3.30
	1990	946,084	2,733	0.0029	2,625.00	2,625.00	7.20
	2001	1,095,145	2,089	0.0019	2,625.00	2,625.00	5.50
	2004	1,156,391	1,946	0.0017	2,625.00	2,625.00	5.10
	2007	1,208,122	1,813	0.0015	2,625.00	2,625.00	4.80
	2013	1,291,576	1,577	0.0012	2,625.00	2,625.00	4.10
POOL PUMP(SOLR)	1980	718,312	7,542	0.0105	0.00	0.00	0.00
	1990	946,084	17,303	0.0183	0.00	0.00	0.00
	2001	1,095,144	24,061	0.0220	0.00	0.00	0.00
	2004	1,156,391	25,541	0.0221	0.00	0.00	0.00
	2007	1,208,122	26,987	0.0223	0.00	0.00	0.00
	2013	1,291,576	29,797	0.0231	0.00	0.00	0.00
TUB PUMP	1980	437,909	38,317	0.0875	771.70	771.70	29.60
	1990	567,208	93,800	0.1654	771.70	771.70	72.40
	2001	670,763	113,440	0.1691	771.70	771.70	87.50
	2004	708,035	120,417	0.1701	771.70	771.70	92.90
	2007	739,588	126,395	0.1709	771.70	771.70	97.50
	2013	790,627	136,252	0.1723	771.70	771.70	105.20
TUB WATER HEAT	1980	437,909	8,977	0.0205	499.80	499.80	4.50
	1990	567,208	23,949	0.0422	499.80	499.80	12.00
	2001	670,763	29,904	0.0446	499.80	499.80	14.90
	2004	708,035	32,038	0.0453	499.80	499.80	16.00
	2007	739,588	33,849	0.0458	499.80	499.80	16.90
	2013	790,627	36,790	0.0465	499.80	499.80	18.40

Table H-1
Residential Electric Consumption Summary by End Use - All Housing Types
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End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (GWh)
CENTRAL A/C	1980	140,878	34,928	0.2479	1,687.40	1,687.40	58.90
	1990	158,588	55,096	0.3474	1,146.10	983.50	63.10
	2001	167,681	67,553	0.4029	958.50	862.60	64.70
	2004	169,699	69,852	0.4116	933.90	861.60	65.20
	2007	171,749	72,002	0.4192	902.70	718.60	65.00
	2013	175,955	75,937	0.4316	852.00	725.10	64.70
ROOM A/C	1980	140,877	44,750	0.3177	214.80	177.40	9.60
	1990	158,587	49,113	0.3097	192.50	173.80	9.40
	2001	167,681	53,694	0.3202	180.60	173.20	9.70
	2004	169,700	54,316	0.3201	179.00	173.10	9.70
	2007	171,750	54,874	0.3195	178.60	173.10	9.80
	2013	175,955	55,917	0.3178	178.10	173.00	10.00
EVAP A/C	1980	140,877	10,854	0.0770	165.60	165.60	1.80
	1990	158,587	9,800	0.0618	165.70	165.70	1.60
	2001	167,681	10,293	0.0614	165.40	165.40	1.70
	2004	169,700	10,373	0.0611	165.40	165.40	1.70
	2007	171,750	10,447	0.0608	165.40	165.40	1.70
	2013	175,955	10,590	0.0602	165.40	165.40	1.80
SPACE HEAT	1980	140,878	15,249	0.1082	3,463.50	3,463.50	52.80
	1990	158,588	23,419	0.1477	2,053.60	1,180.40	48.10
	2001	167,681	24,779	0.1478	1,894.70	1,135.80	46.90
	2004	169,699	25,102	0.1479	1,863.60	1,129.00	46.80
	2007	171,749	25,427	0.1480	1,832.60	1,122.30	46.60
	2013	175,955	26,093	0.1483	1,773.80	1,109.00	46.30
FURNACE FAN	1980	140,877	30,708	0.2180	236.60	0.00	7.30
	1990	158,587	32,052	0.2021	236.30	0.00	7.60
	2001	167,681	34,065	0.2032	236.30	0.00	8.10
	2004	169,700	34,498	0.2033	236.30	0.00	8.20
	2007	171,750	34,936	0.2034	236.30	0.00	8.30
	2013	175,955	35,835	0.2037	236.30	0.00	8.50
HTWATR DISHWASH	1980	140,877	3,663	0.0260	1,050.90	0.00	3.80
	1990	158,587	6,870	0.0433	873.70	0.00	6.00
	2001	167,681	8,226	0.0491	828.90	0.00	6.80
	2004	169,700	8,575	0.0505	825.70	0.00	7.10
	2007	171,750	8,925	0.0520	825.70	0.00	7.40
	2013	175,955	9,619	0.0547	835.40	0.00	8.00
HTWATR CLTHWASH	1980	140,877	7,191	0.0510	1,386.10	0.00	10.00
	1990	158,587	12,119	0.0764	1,062.40	0.00	12.90
	2001	167,681	13,369	0.0797	1,023.30	0.00	13.70
	2004	169,700	13,695	0.0807	1,019.20	0.00	14.00
	2007	171,750	14,018	0.0816	1,019.00	0.00	14.30
	2013	175,955	14,652	0.0833	1,030.20	0.00	15.10
WATER HT(BASIC)	1980	140,877	9,596	0.0681	2,915.50	2,710.80	28.00
	1990	158,587	14,401	0.0908	2,289.80	2,093.10	33.00
	2001	167,681	15,245	0.0909	2,133.40	2,066.30	32.50
	2004	169,700	15,442	0.0910	2,123.90	2,067.60	32.80
	2007	171,750	15,644	0.0911	2,123.20	2,068.60	33.20
	2013	175,955	16,056	0.0913	2,147.10	2,075.30	34.50
REFRIG	1980	140,877	154,453	1.0964	1,510.60	1,538.10	233.30
	1990	158,587	175,729	1.1081	1,405.60	1,200.90	247.00
	2001	167,681	183,418	1.0939	1,225.50	1,011.50	224.80
	2004	169,700	185,141	1.0910	1,187.40	1,014.40	219.80
	2007	171,750	186,931	1.0884	1,155.80	1,016.70	216.00
	2013	175,955	190,718	1.0839	1,109.70	1,018.90	211.60

Table H-1
Residential Electric Consumption Summary by End Use - All Housing Types
BGP

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (GWh)
FREEZER	1980	140,877	18,927	0.1344	1,478.40	1,355.80	28.00
	1990	158,587	26,890	0.1696	1,337.70	970.60	36.00
	2001	167,681	32,104	0.1915	1,182.30	970.60	38.00
	2004	169,700	33,435	0.1970	1,151.10	970.60	38.50
	2007	171,750	34,782	0.2025	1,123.40	970.60	39.10
	2013	175,955	37,476	0.2130	1,079.80	970.60	40.50
COLOR TV	1980	140,877	112,545	0.7989	471.90	346.10	53.10
	1990	158,587	151,591	0.9559	375.40	346.10	56.90
	2001	167,681	163,301	0.9739	366.20	346.10	59.80
	2004	169,700	165,950	0.9779	372.50	346.10	61.90
	2007	171,750	168,550	0.9814	384.00	346.10	64.70
	2013	175,955	173,633	0.9868	417.40	346.10	72.50
COOKING	1980	140,877	26,675	0.1894	683.50	683.50	18.20
	1990	158,587	32,122	0.2025	699.50	699.50	22.50
	2001	167,681	36,878	0.2199	714.80	714.80	26.40
	2004	169,700	38,068	0.2243	719.70	719.70	27.40
	2007	171,750	39,253	0.2286	724.10	724.10	28.40
	2013	175,955	41,607	0.2365	734.00	734.00	30.50
DISH WSH MOTOR	1980	140,877	57,947	0.4113	276.20	276.20	16.00
	1990	158,587	82,823	0.5223	284.60	269.70	23.60
	2001	167,681	97,726	0.5828	281.20	275.40	27.40
	2004	169,700	101,372	0.5974	281.10	277.20	28.50
	2007	171,750	104,994	0.6113	282.20	279.00	29.70
	2013	175,955	112,175	0.6375	285.80	282.60	32.10
CLOTHES DRYER	1980	140,877	31,194	0.2214	1,010.70	1,010.70	31.50
	1990	158,587	40,050	0.2525	1,057.40	1,057.40	42.30
	2001	167,681	44,549	0.2657	1,076.60	1,076.60	47.90
	2004	169,700	45,688	0.2692	1,082.50	1,082.50	49.50
	2007	171,750	46,830	0.2727	1,088.90	1,088.90	51.00
	2013	175,955	49,106	0.2791	1,068.50	827.80	52.50
SOLR WATER HEAT	1980	140,877	141	0.0010	567.70	488.70	0.10
	1990	158,587	1,113	0.0070	394.30	382.20	0.40
	2001	167,681	1,130	0.0067	384.50	378.60	0.40
	2004	169,700	1,132	0.0067	384.20	378.70	0.40
	2007	171,750	1,135	0.0066	383.90	378.80	0.40
	2013	175,955	1,142	0.0065	382.70	379.10	0.40
SOLR WATRHT PMP	1980	140,877	358	0.0025	517.50	517.50	0.20
	1990	158,587	5,831	0.0368	517.50	517.50	3.00
	2001	167,681	6,096	0.0364	517.50	517.50	3.20
	2004	169,700	6,157	0.0363	517.50	517.50	3.20
	2007	171,750	6,219	0.0362	517.50	517.50	3.20
	2013	175,955	6,348	0.0361	517.50	517.50	3.30
CLOTH WASH MTR	1980	140,877	108,846	0.7726	67.80	67.80	7.40
	1990	158,587	134,852	0.8503	72.80	72.80	9.90
	2001	167,681	147,310	0.8785	74.70	74.70	11.00
	2004	169,700	150,319	0.8858	75.20	75.20	11.30
	2007	171,750	153,288	0.8925	75.80	75.80	11.60
	2013	175,955	159,115	0.9043	76.30	76.30	12.20
WATER BED	1980	140,877	8,666	0.0615	1,670.50	1,637.60	14.50
	1990	158,587	13,914	0.0877	1,499.40	1,469.70	20.90
	2001	167,681	16,682	0.0995	1,488.90	1,469.70	24.80
	2004	169,700	17,363	0.1023	1,491.50	1,469.70	25.90
	2007	171,750	18,065	0.1052	1,495.00	1,469.70	27.00
	2013	175,955	19,436	0.1105	1,502.60	1,469.70	29.20

Table H-1
Residential Electric Consumption Summary by End Use - All Housing Types
BGP

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (GWh)
MISCELLANEOUS	1980	140,877	140,877	1.0000	856.50	0.00	120.70
	1990	158,587	158,587	1.0000	1,300.20	0.00	206.20
	2001	167,681	167,681	1.0000	1,140.70	0.00	191.30
	2004	169,700	169,700	1.0000	1,103.80	0.00	187.30
	2007	171,750	171,750	1.0000	1,198.90	0.00	205.90
	2013	175,955	175,955	1.0000	1,381.70	0.00	243.10
POOL PUMP	1980	140,877	12,669	0.0899	3,837.00	3,262.00	48.60
	1990	158,587	16,502	0.1041	3,365.40	2,796.70	55.50
	2001	167,681	17,446	0.1040	3,122.10	2,795.50	54.50
	2004	169,700	17,644	0.1040	3,073.30	2,795.40	54.20
	2007	171,750	17,845	0.1039	3,030.70	2,795.30	54.10
	2013	175,955	18,258	0.1038	2,965.20	2,795.10	54.10
POOL WATER HEAT	1980	140,877	397	0.0028	2,875.00	2,875.00	1.10
	1990	158,587	635	0.0040	2,875.00	2,875.00	1.80
	2001	167,681	673	0.0040	2,875.00	2,875.00	1.90
	2004	169,700	682	0.0040	2,875.00	2,875.00	2.00
	2007	171,750	691	0.0040	2,875.00	2,875.00	2.00
	2013	175,955	709	0.0040	2,875.00	2,875.00	2.00
POOL PUMP(SOLR)	1980	140,877	2,536	0.0180	0.00	0.00	0.00
	1990	158,587	4,255	0.0268	0.00	0.00	0.00
	2001	167,681	6,061	0.0362	0.00	0.00	0.00
	2004	169,699	6,501	0.0383	0.00	0.00	0.00
	2007	171,751	6,928	0.0403	0.00	0.00	0.00
	2013	175,956	7,743	0.0440	0.00	0.00	0.00
TUB PUMP	1980	76,104	5,334	0.0701	845.20	845.20	4.50
	1990	76,697	7,152	0.0933	845.20	845.20	6.00
	2001	82,214	8,848	0.1076	845.20	845.20	7.50
	2004	83,386	9,242	0.1108	845.20	845.20	7.80
	2007	84,572	9,639	0.1140	845.20	845.20	8.10
	2013	86,995	10,440	0.1200	845.20	845.20	8.80
TUB WATER HEAT	1980	76,104	886	0.0116	547.40	547.40	0.50
	1990	76,697	1,015	0.0132	547.40	547.40	0.60
	2001	82,214	1,216	0.0148	547.40	547.40	0.70
	2004	83,386	1,263	0.0151	547.40	547.40	0.70
	2007	84,572	1,309	0.0155	547.40	547.40	0.70
	2013	86,995	1,403	0.0161	547.40	547.40	0.80

Table H-2
Residential Natural Gas Consumption Summary by End Use - All Housing Types
PG&E

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (MM Therms)
CENTRAL A/C	1980	3,270,580	45,766	0.01399	301.5	286.8	13.8
	1990	3,897,420	89,714	0.02302	205.5	168.2	18.4
	2001	4,422,094	105,712	0.0239	177.5	163	18.8
	2004	4,628,767	112,869	0.02438	171.7	160.9	19.4
	2007	4,812,082	119,548	0.02484	167.3	159.3	20
	2013	5,167,946	132,801	0.0257	162.4	157.1	21.6
SPACE HEAT	1980	3,270,580	2,644,448	0.80856	475	451.9	1,255.60
	1990	3,897,420	2,980,874	0.76483	373.2	347.4	1,112.30
	2001	4,422,094	3,325,276	0.75197	310.8	289.5	1,033.90
	2004	4,628,767	3,459,269	0.74734	296.5	278.9	1,025.30
	2007	4,812,082	3,577,410	0.74342	284.2	269.8	1,016.60
	2013	5,167,946	3,807,440	0.73674	264.9	255.2	1,008.70
HTWATR DISHWASH	1980	3,270,577	1,367,188	0.41802	64.2	0	87.7
	1990	3,897,423	1,902,700	0.48819	58.2	0	110.9
	2001	4,422,094	2,435,427	0.55074	53.8	0	131.4
	2004	4,628,766	2,620,786	0.5662	53.8	0	141.1
	2007	4,812,079	2,788,410	0.57946	53.8	0	150.7
	2013	5,167,944	3,113,214	0.60241	55.3	0	171.5
HTWATR CLTHWASH	1980	3,270,577	2,292,137	0.70084	82.1	0	188.7
	1990	3,897,423	2,851,746	0.7317	64.8	0	185.2
	2001	4,422,094	3,286,524	0.7432	61.7	0	203
	2004	4,628,766	3,445,681	0.74441	61.7	0	212.3
	2007	4,812,079	3,588,623	0.74576	61.7	0	222
	2013	5,167,944	3,866,662	0.7482	63.3	0	244
WATER HT(BASIC)	1980	3,270,577	2,734,349	0.83604	172.5	155.5	471.2
	1990	3,897,423	3,222,456	0.82682	132.7	113.4	426.9
	2001	4,422,094	3,649,980	0.82539	120	113.8	438.3
	2004	4,628,766	3,813,231	0.82381	119.8	114.4	456.6
	2007	4,812,079	3,957,645	0.82244	120.4	115.1	475.7
	2013	5,167,944	4,237,798	0.82002	122.3	115.1	519.4
COOKING	1980	3,270,577	1,292,929	0.39532	65.8	39.4	85.2
	1990	3,897,423	1,325,275	0.34004	57.2	40.3	75.6
	2001	4,422,094	1,444,437	0.32664	50.7	41.6	73.3
	2004	4,628,766	1,496,726	0.32335	49.7	42.2	74.3
	2007	4,812,079	1,543,786	0.32082	48.7	42.3	75.4
	2013	5,167,944	1,636,331	0.31663	47.6	42.9	77.7
CLOTHES DRYER	1980	3,270,577	576,257	0.17619	30.4	30.4	17.6
	1990	3,897,423	785,083	0.20144	32.1	32.1	25.4
	2001	4,422,094	930,740	0.21047	33.5	33.5	31.2
	2004	4,628,766	981,722	0.21209	33.5	33.5	33.2
	2007	4,812,079	1,028,990	0.21383	34.2	34.2	35.1
	2013	5,167,944	1,122,218	0.21715	34.2	34.2	38.6
SOLR WATER HEAT	1980	3,073,910	27,800	0.00904	61.7	53.8	1.7
	1990	3,641,850	36,053	0.0099	42.7	39.2	1.5
	2001	4,177,020	36,825	0.00882	41.6	39.3	1.5
	2004	4,368,567	37,225	0.00852	41.6	39.3	1.5
	2007	4,538,334	37,553	0.00827	41.6	39.3	1.6
	2013	4,867,953	38,181	0.00785	40.8	40.1	1.6
MISCELLANEOUS	1980	3,270,577	3,270,577	1	8.5	0	28.5
	1990	3,897,423	3,897,423	1	11	0	42.8
	2001	4,422,094	4,422,094	1	14.2	0	61.6
	2004	4,628,766	4,628,766	1	12.4	0	57.9
	2007	4,812,079	4,812,079	1	13.3	0	65
	2013	5,167,944	5,167,944	1	15.3	0	79.1
POOL WATER HEAT	1980	3,270,577	71,953	0.022	285	285	20.5
	1990	3,897,423	42,872	0.011	285	271	12.2
	2001	4,422,094	51,261	0.01159	278.4	271	14.3
	2004	4,628,766	54,481	0.01177	277.2	271	15.1
	2007	4,812,079	57,345	0.01192	275.5	271	15.8
	2013	5,167,944	62,900	0.01217	273.7	271	17.2
POOL PUMP(SOLR)	1980	3,270,576	103,023	0.0315	307.8	307.8	31.7
	1990	3,897,421	66,256	0.017	306.9	292	20.4
	2001	4,422,096	74,913	0.01694	306.9	292	23
	2004	4,628,768	74,541	0.0161	306.9	292	22.9
	2007	4,812,079	74,204	0.01542	306.9	292	22.8
	2013	5,167,945	73,740	0.01427	306.9	292	22.6
TUB WATER HEAT	1980	2,146,878	68,700	0.032	191.2	191.2	13.1
	1990	2,549,156	76,475	0.03	191.2	191.2	14.6
	2001	2,957,926	102,510	0.03466	191.2	191.2	19.6
	2004	3,108,751	111,705	0.03593	191.2	191.2	21.4
	2007	3,247,038	120,175	0.03701	191.2	191.2	23
	2013	3,519,346	136,841	0.03888	191.2	191.2	26.2

Table H-2
Residential Natural Gas Consumption Summary by End Use - All Housing Types
SMUD

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (MM Therms)
CENTRAL A/C	1980	303,166	9,381	0.03095	340	324.6	3.2
	1990	396,134	9,799	0.02473	290.8	276.6	2.9
	2001	463,723	10,775	0.02324	270.2	264.7	2.9
	2004	487,469	11,042	0.02265	266.5	261.9	2.9
	2007	509,699	11,287	0.02214	263.5	259.4	3
	2013	553,902	11,738	0.02119	260.5	256.1	3.1
SPACE HEAT	1980	303,166	232,066	0.76547	565.3	537.4	131.1
	1990	396,134	283,788	0.7164	425.3	397.7	120.7
	2001	463,723	343,535	0.74082	345.6	323.6	118.7
	2004	487,469	363,889	0.74649	331.4	313.4	120.7
	2007	509,699	382,942	0.75131	319.8	304.8	122.5
	2013	553,902	420,795	0.75969	302.1	291.9	127.1
HTWATR DISHWASH	1980	303,166	141,592	0.46705	63.2	0	8.9
	1990	396,135	218,087	0.55054	54.5	0	11.9
	2001	463,722	279,673	0.6031	50.4	0	14.2
	2004	487,468	299,294	0.61398	50.4	0	15.1
	2007	509,698	317,761	0.62343	50.5	0	16.1
	2013	553,903	354,232	0.63952	51.4	0	18.2
HTWATR CLTHWASH	1980	303,166	199,435	0.65784	81.3	0	16.2
	1990	396,135	288,551	0.72842	62.3	0	17.9
	2001	463,722	339,661	0.73247	58.8	0	20.1
	2004	487,468	356,446	0.73122	58.8	0	21.1
	2007	509,698	372,144	0.73013	59.5	0	22
	2013	553,903	403,324	0.72815	59.7	0	24.2
WATER HT(BASIC)	1980	303,166	222,712	0.73462	171.4	154.5	38.2
	1990	396,135	302,152	0.76275	128.5	113.5	38.9
	2001	463,722	349,931	0.75461	118.5	114	41.4
	2004	487,468	366,493	0.75183	117.6	114	43.2
	2007	509,698	381,934	0.74933	117.6	114.6	45
	2013	553,903	412,573	0.74485	119.4	114.6	49.2
COOKING	1980	303,166	112,101	0.36977	66.1	39.4	7.4
	1990	396,135	126,166	0.31849	54.5	39.8	6.9
	2001	463,722	138,050	0.2977	49	40.6	6.7
	2004	487,468	142,914	0.29318	47.9	41.3	6.8
	2007	509,698	147,501	0.28938	47	41.3	7
	2013	553,903	156,781	0.28304	46	41.4	7.2
CLOTHES DRYER	1980	303,166	17,537	0.05784	30.2	30.2	0.5
	1990	396,135	32,644	0.08241	30.4	30.4	1
	2001	463,722	53,175	0.11467	31.3	31.3	1.7
	2004	487,468	59,303	0.12166	32	32	1.9
	2007	509,698	65,386	0.12828	32.1	32.1	2.1
	2013	553,903	77,784	0.14043	32.1	32.1	2.5
SOLR WATER HEAT	1980	289,001	897	0.0031	56.2	52.8	0.1
	1990	378,655	3,581	0.00946	42.2	38.7	0.1
	2001	446,769	5,781	0.01294	40.9	40.1	0.2
	2004	468,837	6,461	0.01378	40.9	40.1	0.3
	2007	489,495	7,168	0.01464	41.1	40.3	0.3
	2013	530,585	8,662	0.01633	41.2	40.4	0.4
MISCELLANEOUS	1980	303,166	303,166	1	7.6	0	2.2
	1990	396,135	396,135	1	8.7	0	3.5
	2001	463,722	463,722	1	8.4	0	4.1
	2004	487,468	487,468	1	7.5	0	3.8
	2007	509,698	509,698	1	8.4	0	4.2
	2013	553,903	553,903	1	9.3	0	5.2
POOL WATER HEAT	1980	303,166	7,731	0.0255	406.9	406.9	3.1
	1990	396,135	14,500	0.03661	396.2	386.8	5.7
	2001	463,722	15,222	0.03282	392.4	386.8	6
	2004	487,468	15,611	0.03203	391.5	386.8	6.1
	2007	509,698	15,937	0.03127	390.5	386.8	6.2
	2013	553,903	16,560	0.0299	389.6	386.8	6.4
POOL PUMP(SOLR)	1980	303,167	13,491	0.0445	307.8	307.8	4.2
	1990	396,134	11,641	0.02939	307.8	292	3.6
	2001	463,722	15,607	0.03366	306.9	292	4.8
	2004	487,468	16,476	0.0338	306.9	292	5.1
	2007	509,698	17,343	0.03403	306.9	292	5.3
	2013	553,903	19,132	0.03454	306.9	292	5.9
TUB WATER HEAT	1980	202,659	7,498	0.037	191.2	191.2	1.4
	1990	269,090	14,136	0.05253	185.9	181.5	2.6
	2001	328,058	15,659	0.04773	184.2	181.5	2.9
	2004	346,639	16,189	0.0467	184.2	181.5	3
	2007	364,068	16,640	0.04571	183.3	181.5	3.1
	2013	398,750	17,499	0.04388	182.4	181.5	3.2

Table H-2
Residential Natural Gas Consumption Summary by End Use - All Housing Types
SCE

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (MM Therms)
CENTRAL A/C	1980	2,990,440	98,702	0.03301	264.3	249	26
	1990	3,683,748	76,239	0.0207	202.3	191.5	15.4
	2001	4,080,521	90,571	0.0222	186.8	183.1	16.9
	2004	4,247,007	96,500	0.02272	185.1	182.2	17.9
	2007	4,403,767	102,235	0.02322	183.8	181.6	18.8
	2013	4,768,591	115,264	0.02417	183.1	181.4	21.1
SPACE HEAT	1980	2,990,440	2,636,506	0.88164	338.5	322.1	892.4
	1990	3,683,748	3,139,595	0.85228	251.8	234.7	790.6
	2001	4,080,521	3,457,521	0.84732	210.2	195.8	726.6
	2004	4,247,007	3,589,700	0.84523	201.3	189.4	722.3
	2007	4,403,767	3,714,163	0.84341	193.9	184	720
	2013	4,768,591	4,004,865	0.83984	181.3	174.6	725.9
HTWATR DISHWASH	1980	2,990,438	1,345,178	0.44983	61.4	0	82.3
	1990	3,683,744	2,024,562	0.54959	52.7	0	106.4
	2001	4,080,522	2,523,326	0.61839	50	0	126.4
	2004	4,247,004	2,699,318	0.63558	50	0	135.9
	2007	4,403,765	2,866,330	0.65088	50.9	0	145.9
	2013	4,768,589	3,236,424	0.67869	51.7	0	167.4
HTWATR CLTHWASH	1980	2,990,438	2,280,165	0.76249	78.9	0	179.6
	1990	3,683,744	2,812,226	0.76342	59.5	0	168.4
	2001	4,080,522	3,198,973	0.78396	58.9	0	187.6
	2004	4,247,004	3,346,527	0.78797	58.9	0	197.2
	2007	4,403,765	3,485,774	0.79154	59.6	0	207.6
	2013	4,768,589	3,802,461	0.7974	60.4	0	230.2
WATER HT(BASIC)	1980	2,990,438	2,608,242	0.87219	167.8	151.4	437.8
	1990	3,683,744	3,074,043	0.83449	132.5	115.4	407.6
	2001	4,080,522	3,411,405	0.83603	123.6	117.1	422.1
	2004	4,247,004	3,550,431	0.83598	124.2	117.7	441.3
	2007	4,403,765	3,681,592	0.83601	125.7	118.3	462.4
	2013	4,768,589	3,986,553	0.836	127.6	118.4	508.7
COOKING	1980	2,990,438	2,153,721	0.7202	67.7	41.7	145.5
	1990	3,683,744	2,537,756	0.68891	56.6	43.5	143.8
	2001	4,080,522	2,786,574	0.6829	51	45.5	143.1
	2004	4,247,004	2,895,673	0.68181	50.8	46.2	146.2
	2007	4,403,765	2,997,565	0.68068	49.9	46.2	150
	2013	4,768,589	3,237,339	0.67888	49.1	46.3	159.3
CLOTHES DRYER	1980	2,990,438	1,372,330	0.45891	32.8	32.8	45.3
	1990	3,683,744	1,908,122	0.51798	35	35	67.3
	2001	4,080,522	2,191,320	0.53702	37.1	37.1	81.7
	2004	4,247,004	2,299,938	0.54154	37.7	37.7	86.6
	2007	4,403,765	2,401,589	0.54535	37.7	37.7	91.3
	2013	4,768,589	2,631,890	0.55193	38.3	38.3	100.3
SOLR WATER HEAT	1980	2,813,154	53,151	0.01889	49.6	42.8	2.6
	1990	3,466,906	92,251	0.02661	39	32.8	3.6
	2001	3,872,781	96,188	0.02484	36.7	33.2	3.5
	2004	4,027,083	97,870	0.0243	36	33.2	3.5
	2007	4,172,305	99,418	0.02383	35.8	33.5	3.6
	2013	4,510,797	103,179	0.02287	35	33.5	3.6
MISCELLANEOUS	1980	2,990,438	2,990,438	1	8.2	0	25
	1990	3,683,744	3,683,744	1	11.1	0	39.7
	2001	4,080,522	4,080,522	1	9.9	0	40.4
	2004	4,247,004	4,247,004	1	9.7	0	40.2
	2007	4,403,765	4,403,765	1	9.9	0	44.9
	2013	4,768,589	4,768,589	1	11.4	0	54.6
POOL WATER HEAT	1980	2,990,438	164,474	0.055	223.1	223.1	36.7
	1990	3,683,744	261,545	0.071	217.7	211.9	56.9
	2001	4,080,522	270,608	0.06631	215.4	211.9	58.3
	2004	4,247,004	277,239	0.06528	214.5	211.9	59.6
	2007	4,403,765	283,114	0.06429	214.5	211.9	60.7
	2013	4,768,589	298,253	0.06255	213.6	211.9	63.7
POOL PUMP(SOLR)	1980	2,990,439	35,885	0.012	223.1	223.1	8
	1990	3,683,745	73,675	0.02	223.1	211.9	16.4
	2001	4,080,523	106,601	0.02612	222.2	211.9	23.7
	2004	4,247,003	115,675	0.02724	222.2	211.9	25.7
	2007	4,403,763	124,604	0.02829	222.2	211.9	27.7
	2013	4,768,588	143,607	0.03012	222.2	211.9	31.9
TUB WATER HEAT	1980	1,991,621	121,489	0.061	162.2	162.2	19.7
	1990	2,430,808	281,974	0.116	162.2	162.2	45.7
	2001	2,747,873	334,520	0.12174	162.2	162.2	54.2
	2004	2,864,728	353,818	0.12351	162.2	162.2	57.4
	2007	2,976,743	372,186	0.12503	162.2	162.2	60.4
	2013	3,234,824	414,368	0.1281	162.2	162.2	67.2

Table H-2
Residential Natural Gas Consumption Summary by End Use - All Housing Types
LADWP

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (MM Therms)
CENTRAL A/C	1980	1,141,082	43,279	0.03793	225.2	213.5	9.7
	1990	1,224,258	31,762	0.02594	175.5	159.6	5.3
	2001	1,283,140	36,345	0.02832	147.6	145.7	5.4
	2004	1,300,720	37,864	0.02911	145.8	144.3	5.5
	2007	1,318,565	39,397	0.02988	144.2	142.8	5.7
	2013	1,355,038	42,487	0.03136	143	141.9	6.1
SPACE HEAT	1980	1,141,082	1,023,797	0.89722	334.8	317.9	342.7
	1990	1,224,258	1,028,647	0.84022	289.6	261.9	297.4
	2001	1,283,140	1,040,027	0.81053	270.1	236	280.6
	2004	1,300,720	1,042,702	0.80163	266.3	233.3	277.3
	2007	1,318,565	1,045,618	0.793	262.6	230.1	274
	2013	1,355,038	1,052,157	0.77648	255.4	224.8	268.4
HTWATR DISHWASH	1980	1,141,082	427,457	0.37461	61.2	0	26.2
	1990	1,224,260	510,547	0.41702	55.3	0	28.1
	2001	1,283,140	613,774	0.47834	51.6	0	31.4
	2004	1,300,720	642,751	0.49415	51	0	32.9
	2007	1,318,566	671,465	0.50924	51.4	0	34.5
	2013	1,355,037	728,099	0.53733	52.1	0	38.1
HTWATR CLTHWASH	1980	1,141,082	816,783	0.71579	79.2	0	64.8
	1990	1,224,260	860,805	0.70312	64	0	54.9
	2001	1,283,140	944,850	0.73636	61.1	0	57.6
	2004	1,300,720	969,086	0.74504	61	0	59.1
	2007	1,318,566	992,940	0.75304	61.4	0	60.9
	2013	1,355,037	1,039,310	0.767	62.6	0	65
WATER HT(BASIC)	1980	1,141,082	1,056,338	0.92573	165.3	149.4	174.5
	1990	1,224,260	1,077,602	0.88021	137.8	117.2	148.2
	2001	1,283,140	1,127,756	0.87891	126.1	118	142
	2004	1,300,720	1,142,707	0.87852	125.6	117.9	143.8
	2007	1,318,566	1,157,894	0.87815	126.4	118.3	146.6
	2013	1,355,037	1,188,965	0.87744	128.9	119.1	153.4
COOKING	1980	1,141,082	922,389	0.80835	64.6	38	59.5
	1990	1,224,260	979,863	0.80037	57.1	41.7	56
	2001	1,283,140	1,005,178	0.78337	51.8	42.8	51.9
	2004	1,300,720	1,013,593	0.77925	50.5	43.2	51.3
	2007	1,318,566	1,022,316	0.77532	49.6	43.2	51
	2013	1,355,037	1,040,648	0.76799	49	43.5	50.9
CLOTHES DRYER	1980	1,141,082	511,788	0.44851	30.8	30.8	15.6
	1990	1,224,260	607,758	0.49643	34.2	34.2	20.7
	2001	1,283,140	665,112	0.51835	35.4	35.4	23.3
	2004	1,300,720	681,073	0.52361	35.3	35.3	24
	2007	1,318,566	696,782	0.52844	35.8	35.8	24.7
	2013	1,355,037	727,672	0.53701	36.1	36.1	26.1
SOLR WATER HEAT	1980	1,141,082	1,706	0.00149	52.9	43.2	0.1
	1990	1,224,260	23,798	0.01944	37.8	35.2	0.9
	2001	1,283,140	23,703	0.01847	36.9	34.9	0.9
	2004	1,300,720	23,633	0.01817	36.3	34.9	0.9
	2007	1,318,566	23,568	0.01788	36.3	34.9	0.9
	2013	1,355,037	23,456	0.01731	36.3	35.7	0.9
MISCELLANEOUS	1980	1,141,082	1,141,082	1	8.6	0	10.1
	1990	1,224,260	1,224,260	1	12.3	0	15.4
	2001	1,283,140	1,283,140	1	10.9	0	14.1
	2004	1,300,720	1,300,720	1	10.5	0	13.7
	2007	1,318,566	1,318,566	1	11.8	0	15
	2013	1,355,037	1,355,037	1	13	0	17.5
POOL WATER HEAT	1980	1,141,082	76,452	0.067	223.1	223.1	17.1
	1990	1,224,260	102,838	0.084	218.7	211.9	22.5
	2001	1,283,140	97,597	0.07606	216.6	211.9	21.1
	2004	1,300,720	96,373	0.07409	215.8	211.9	20.8
	2007	1,318,566	95,232	0.07222	214.9	211.9	20.5
	2013	1,355,037	93,184	0.06877	214.9	211.9	20
POOL PUMP(SOLR)	1980	1,141,081	21,110	0.0185	223.1	223.1	4.7
	1990	1,224,261	26,934	0.022	220.5	211.9	5.9
	2001	1,283,140	34,908	0.0272	217.9	211.9	7.6
	2004	1,300,719	36,841	0.02832	217.1	211.9	8
	2007	1,318,566	38,739	0.02938	217.1	211.9	8.4
	2013	1,355,036	42,438	0.03132	216.2	211.9	9.2
TUB WATER HEAT	1980	564,463	31,751	0.05625	162.2	162.2	5.1
	1990	567,437	54,474	0.096	162.2	162.2	8.8
	2001	588,926	65,842	0.1118	162.2	162.2	10.7
	2004	594,848	68,960	0.11593	162.2	162.2	11.2
	2007	600,927	72,082	0.11995	162.2	162.2	11.7
	2013	613,528	78,330	0.12767	162.2	162.2	12.7

Table H-2
Residential Natural Gas Consumption Summary by End Use - All Housing Types
SDG&E

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (MM Therms)
CENTRAL A/C	1980	718,313	9,343	0.01301	105.1	100.4	1
	1990	946,085	31,809	0.03362	87.8	86.6	2.8
	2001	1,095,144	46,594	0.04255	86.5	86.2	4
	2004	1,156,392	51,983	0.04495	86.3	86.2	4.5
	2007	1,208,123	56,729	0.04696	86.2	86.2	4.9
	2013	1,291,578	64,877	0.05023	86.2	86.2	5.6
SPACE HEAT	1980	718,313	577,522	0.804	238.1	226.5	137.5
	1990	946,085	667,900	0.70596	182.9	170.1	122.2
	2001	1,095,144	772,286	0.70519	145.6	135.3	112.5
	2004	1,156,392	814,915	0.70471	137.5	128.9	112
	2007	1,208,123	850,914	0.70433	130.9	123.9	111.3
	2013	1,291,578	908,953	0.70376	121.8	116.8	110.5
HTWATR DISHWASH	1980	718,313	324,035	0.45111	53.3	0	17.3
	1990	946,084	543,486	0.57446	45.3	0	24.7
	2001	1,095,145	710,828	0.64907	42	0	29.9
	2004	1,156,391	770,834	0.66658	41.7	0	32.3
	2007	1,208,122	822,908	0.68115	42.1	0	34.6
	2013	1,291,576	910,054	0.70461	42.9	0	39.1
HTWATR CLTHWASH	1980	718,313	518,550	0.7219	68.9	0	35.8
	1990	946,084	755,541	0.7986	52.6	0	39.6
	2001	1,095,145	889,405	0.81213	49.5	0	44.2
	2004	1,156,391	941,475	0.81415	49.3	0	46.7
	2007	1,208,122	985,487	0.81572	49.8	0	49
	2013	1,291,576	1,056,514	0.818	51	0	53.7
WATER HT(BASIC)	1980	718,313	596,606	0.83057	145.8	131.9	87.1
	1990	946,084	780,171	0.82463	112.8	98.8	87.8
	2001	1,095,145	904,718	0.82612	103.6	99.5	93.8
	2004	1,156,391	955,586	0.82635	103.5	100	98.9
	2007	1,208,122	998,291	0.82632	104	100.5	103.7
	2013	1,291,576	1,066,515	0.82575	106.4	100.7	113.3
COOKING	1980	718,313	374,401	0.52122	58.3	35.2	21.7
	1990	946,084	453,063	0.47889	47.8	36.7	21.7
	2001	1,095,145	504,506	0.46067	43	37.9	21.8
	2004	1,156,391	528,022	0.45661	42.7	37.9	22.5
	2007	1,208,122	546,847	0.45264	42.5	38.5	23.1
	2013	1,291,576	574,682	0.44495	41.6	39	24
CLOTHES DRYER	1980	718,313	197,321	0.2747	27.6	27.6	5.4
	1990	946,084	388,529	0.41067	26.7	26.7	10.3
	2001	1,095,145	462,881	0.42267	27.1	27.1	12.6
	2004	1,156,391	490,822	0.42444	27.5	27.5	13.5
	2007	1,208,122	514,688	0.42602	27.5	27.5	14.3
	2013	1,291,576	553,766	0.42875	28.3	28.3	15.6
SOLR WATER HEAT	1980	671,922	12,519	0.01863	44.4	38.9	0.6
	1990	891,581	24,212	0.02716	33.3	27.1	0.8
	2001	1,041,552	30,835	0.0296	28.8	27.5	0.9
	2004	1,098,932	32,866	0.02991	28.9	28.2	0.9
	2007	1,147,376	34,907	0.03043	28.9	28.3	1
	2013	1,225,468	39,025	0.03185	29	28.4	1.1
MISCELLANEOUS	1980	718,313	718,313	1	7.9	0	5.6
	1990	946,084	946,084	1	10.7	0	10.1
	2001	1,095,145	1,095,145	1	12.2	0	13
	2004	1,156,391	1,156,391	1	11.5	0	13.5
	2007	1,208,122	1,208,122	1	12.7	0	15.3
	2013	1,291,576	1,291,576	1	15	0	18.9
POOL WATER HEAT	1980	718,313	24,781	0.0345	92.4	92.4	2.3
	1990	946,084	38,725	0.04093	90.7	87.9	3.5
	2001	1,095,145	44,105	0.04027	89.4	87.9	3.9
	2004	1,156,391	46,578	0.04028	89.1	87.9	4.1
	2007	1,208,122	48,507	0.04015	88.7	87.9	4.3
	2013	1,291,576	51,218	0.03965	88.6	87.9	4.5
POOL PUMP(SOLR)	1980	718,312	7,542	0.0105	268.2	268.2	2
	1990	946,084	17,303	0.01829	267.4	254.4	4.6
	2001	1,095,144	24,061	0.02197	267.4	254.4	6.4
	2004	1,156,391	25,541	0.02209	267.4	254.4	6.8
	2007	1,208,122	26,987	0.02234	267.4	254.4	7.2
	2013	1,291,576	29,797	0.02307	267.4	254.4	8
TUB WATER HEAT	1980	437,909	25,399	0.058	144.4	144.4	3.7
	1990	567,208	61,217	0.10793	144.4	144.4	8.8
	2001	670,763	71,935	0.10724	144.4	144.4	10.4
	2004	708,035	75,846	0.10712	144.4	144.4	11
	2007	739,588	79,097	0.10695	144.4	144.4	11.4
	2013	790,627	84,203	0.1065	144.4	144.4	12.2

Table H-2
Residential Natural Gas Consumption Summary by End Use - All Housing Types
BGP

End Use	Year	Housing Stock	Appliance Stock	Appliance Saturation	Average Appliance UEC	Marginal Appliance UEC	Total Energy Used (MM Therms)
CENTRAL A/C	1980	140,878	8,192	0.05815	112	106.9	0.9
	1990	158,588	10,822	0.06824	94.4	90.1	1
	2001	167,681	13,010	0.07759	86.5	85.5	1.1
	2004	169,699	13,403	0.07898	85.8	84.9	1.2
	2007	171,749	13,764	0.08015	85.2	84.3	1.2
	2013	175,955	14,441	0.08208	85.2	84.2	1.2
SPACE HEAT	1980	140,878	124,824	0.88604	281.2	267.2	35.1
	1990	158,588	134,625	0.84891	212.7	192.8	28.6
	2001	167,681	142,332	0.84883	196.5	172.4	27.9
	2004	169,699	144,028	0.84871	193	169.7	27.8
	2007	171,749	145,743	0.84858	189.3	167.1	27.6
	2013	175,955	149,269	0.84834	183.9	162.7	27.4
HTWATR DISHWASH	1980	140,877	54,080	0.38388	59.2	0	3.2
	1990	158,587	75,765	0.47775	52.8	0	4
	2001	167,681	89,297	0.53254	48.3	0	4.3
	2004	169,700	92,590	0.54561	48.3	0	4.5
	2007	171,750	95,861	0.55814	48.3	0	4.6
	2013	175,955	102,344	0.58165	49.6	0	5.1
HTWATR CLTHWASH	1980	140,877	101,230	0.71856	76.4	0	7.8
	1990	158,587	122,419	0.77194	60.8	0	7.4
	2001	167,681	133,629	0.79692	57.4	0	7.6
	2004	169,700	136,314	0.80326	57.4	0	7.8
	2007	171,750	138,962	0.80909	57.4	0	8
	2013	175,955	144,158	0.81929	58.7	0	8.4
WATER HT(BASIC)	1980	140,877	130,315	0.92502	160.4	144	20.9
	1990	158,587	137,978	0.87005	132.5	111.8	18.3
	2001	167,681	145,979	0.87057	120.1	111.4	17.5
	2004	169,700	147,743	0.87061	119.7	111.9	17.7
	2007	171,750	149,534	0.87065	120.5	112.3	18
	2013	175,955	153,209	0.87073	122.7	112.8	18.8
COOKING	1980	140,877	114,048	0.80956	61.7	35.5	7
	1990	158,587	126,394	0.79701	53.2	37.8	6.8
	2001	167,681	130,745	0.77973	47.4	38.8	6.2
	2004	169,700	131,576	0.77534	46.5	38.8	6.1
	2007	171,750	132,445	0.77114	45.7	39.3	6.1
	2013	175,955	134,302	0.76326	44.9	39.7	6
CLOTHES DRYER	1980	140,877	64,610	0.45863	27.7	27.7	1.8
	1990	158,587	87,916	0.55438	30.5	30.5	2.7
	2001	167,681	97,069	0.57889	31	31	3
	2004	169,700	99,162	0.58434	31.5	31.5	3.1
	2007	171,750	101,221	0.58935	31.5	31.5	3.2
	2013	175,955	105,265	0.59825	32	32	3.4
SOLR WATER HEAT	1980	140,877	217	0.00154	50.4	40.9	0
	1990	158,587	4,720	0.02976	36.1	34.3	0.2
	2001	167,681	4,966	0.02962	35.3	33.5	0.2
	2004	169,700	5,025	0.02961	34.6	33.7	0.2
	2007	171,750	5,084	0.0296	34.6	33.7	0.2
	2013	175,955	5,206	0.02958	34.6	33.7	0.2
MISCELLANEOUS	1980	140,877	140,877	1	7.7	0	1.1
	1990	158,587	158,587	1	10.7	0	1.7
	2001	167,681	167,681	1	9	0	1.5
	2004	169,700	169,700	1	9	0	1.5
	2007	171,750	171,750	1	9.4	0	1.6
	2013	175,955	175,955	1	10.7	0	1.9
POOL WATER HEAT	1980	140,877	9,208	0.06536	223.1	223.1	2.1
	1990	158,587	12,711	0.08015	219.6	211.9	2.8
	2001	167,681	11,903	0.07098	217.1	211.9	2.6
	2004	169,700	11,679	0.06882	216.6	211.9	2.5
	2007	171,750	11,471	0.06679	215.8	211.9	2.5
	2013	175,955	11,101	0.06309	214.9	211.9	2.4
POOL PUMP(SOLR)	1980	140,877	2,536	0.018	223.1	223.1	0.6
	1990	158,587	4,255	0.02683	223.1	223.1	0.9
	2001	167,681	6,061	0.03615	223.1	223.1	1.4
	2004	169,699	6,501	0.03831	223.1	223.1	1.5
	2007	171,751	6,928	0.04034	223.1	223.1	1.5
	2013	175,956	7,743	0.04401	223.1	223.1	1.7
TUB WATER HEAT	1980	76,104	4,296	0.05645	162.2	162.2	0.7
	1990	76,697	5,707	0.07441	159.6	154.4	0.9
	2001	82,214	6,443	0.07837	157	154.4	1
	2004	83,386	6,575	0.07885	156.2	154.4	1
	2007	84,572	6,707	0.0793	156.2	154.4	1
	2013	86,995	6,970	0.08012	155.3	154.4	1.1

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
PG&E Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Colleges											
GWh by End Use											
1980	115.636	18.268	86.280	6.237	1.623	1.959	286.236	11.452	2.095	18.925	548.712
1990	127.896	16.542	78.533	5.742	1.003	1.422	268.989	11.398	4.642	45.510	561.677
2000	139.012	18.055	88.774	8.551	1.258	1.734	306.910	13.147	7.782	59.360	644.583
2001	145.417	16.815	87.039	8.531	1.234	1.704	301.958	12.962	7.718	58.519	641.898
2003	136.044	17.439	87.972	9.315	1.289	1.770	310.207	13.338	8.076	60.249	645.698
2008	144.722	18.991	94.098	11.826	1.525	2.057	346.821	14.867	9.356	67.282	711.545
2013	147.044	19.716	95.422	13.984	1.694	2.255	369.873	15.788	10.316	71.546	747.638
Average Consumption per Square Foot by End Use (kWh/SF)											
1980	1.327	0.210	0.990	0.072	0.019	0.022	3.285	0.131	0.024	0.217	6.296
1990	1.347	0.174	0.827	0.060	0.011	0.015	2.834	0.120	0.049	0.479	5.918
2000	1.341	0.174	0.856	0.082	0.012	0.017	2.961	0.127	0.075	0.573	6.218
2001	1.394	0.161	0.834	0.082	0.012	0.016	2.894	0.124	0.074	0.561	6.152
2003	1.269	0.163	0.821	0.087	0.012	0.017	2.894	0.124	0.075	0.562	6.024
2008	1.264	0.166	0.822	0.103	0.013	0.018	3.029	0.130	0.082	0.588	6.215
2013	1.217	0.163	0.790	0.116	0.014	0.019	3.061	0.131	0.085	0.592	6.187
Food Stores											
GWh by End Use											
1980	161.629	29.816	252.792	6.974	4.682	810.785	864.107	78.700	0.741	386.724	2,596.951
1990	372.219	39.163	338.895	10.254	4.519	965.970	1,004.123	98.062	2.062	1,170.610	4,005.878
2000	430.742	40.295	405.036	13.794	5.278	1,076.085	1,086.764	108.956	3.488	1,464.378	4,634.817
2001	461.769	37.688	400.442	13.745	5.184	1,056.602	1,058.397	107.128	3.443	1,439.801	4,584.200
2003	434.014	39.016	418.851	14.978	5.427	1,091.760	1,073.303	110.810	3.600	1,489.373	4,681.132
2008	477.565	43.998	500.230	19.492	6.566	1,268.635	1,197.048	127.895	4.286	1,719.321	5,365.037
2013	510.075	46.551	559.115	23.260	7.368	1,384.651	1,262.051	138.650	4.805	1,864.134	5,800.659
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	2.742	0.506	4.288	0.118	0.079	13.754	14.658	1.335	0.013	6.560	44.054
1990	5.031	0.529	4.581	0.139	0.061	13.056	13.572	1.325	0.028	15.822	54.144
2000	5.072	0.474	4.769	0.162	0.062	12.670	12.796	1.283	0.041	17.242	54.573
2001	5.379	0.439	4.664	0.160	0.060	12.308	12.328	1.248	0.040	16.771	53.398
2003	4.913	0.442	4.742	0.170	0.061	12.360	12.151	1.254	0.041	16.861	52.995
2008	4.986	0.459	5.223	0.204	0.069	13.246	12.498	1.335	0.045	17.951	56.015
2013	4.953	0.452	5.429	0.226	0.072	13.444	12.254	1.346	0.047	18.100	56.322
Hospitals											
GWh by End Use											
1980	450.477	1.614	211.630	0.761	6.751	10.462	742.605	23.831	8.237	480.786	1,937.153
1990	764.687	3.296	256.664	3.108	7.615	12.415	908.655	29.995	24.525	1,469.742	3,480.703
2000	939.005	4.203	322.582	6.429	9.613	15.483	1,121.214	37.258	43.920	2,054.826	4,554.534
2001	996.809	4.222	319.587	6.523	9.526	15.344	1,111.057	36.972	43.808	2,039.090	4,582.939
2003	940.676	4.501	329.117	7.169	9.806	15.765	1,141.409	38.048	45.543	2,098.456	4,630.491
2008	1,029.022	5.357	370.485	9.211	11.092	17.724	1,278.950	42.598	52.226	2,349.417	5,166.081
2013	1,082.163	6.057	397.592	11.089	11.974	19.045	1,370.616	45.545	57.190	2,511.969	5,513.242
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	6.862	0.025	3.224	0.012	0.103	0.159	11.312	0.363	0.125	7.324	29.510
1990	8.738	0.038	2.933	0.036	0.087	0.142	10.384	0.343	0.280	16.795	39.776
2000	8.814	0.039	3.028	0.060	0.090	0.145	10.525	0.350	0.412	19.289	42.753
2001	9.211	0.039	2.953	0.060	0.088	0.142	10.267	0.342	0.405	18.843	42.350
2003	8.432	0.040	2.950	0.064	0.088	0.141	10.231	0.341	0.408	18.810	41.506
2008	8.607	0.045	3.099	0.077	0.093	0.148	10.697	0.356	0.437	19.650	43.209
2013	8.521	0.048	3.130	0.087	0.094	0.150	10.792	0.359	0.450	19.778	43.409
Hotel/Motel											
GWh by End Use											
1980	23.896	4.394	36.782	0.765	1.228	18.179	158.711	17.772	0.324	61.669	323.719
1990	46.420	11.277	49.537	2.529	1.286	25.329	220.056	25.990	1.187	219.052	602.664
2000	51.018	13.357	52.661	3.359	1.490	27.625	240.934	28.350	1.861	268.943	689.596
2001	53.910	13.174	52.570	3.530	1.512	27.842	243.032	28.599	1.895	271.314	697.380
2003	51.946	14.155	53.447	3.832	1.581	28.622	250.352	29.446	1.982	279.351	714.715
2008	55.782	16.925	57.273	4.744	1.824	31.555	276.286	32.330	2.257	306.716	785.690
2013	58.072	19.333	59.236	5.558	2.018	33.677	294.732	34.312	2.472	325.533	834.944
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.407	0.075	0.626	0.013	0.021	0.309	2.700	0.302	0.006	1.049	5.508
1990	0.523	0.127	0.559	0.029	0.014	0.286	2.481	0.293	0.013	2.470	6.796
2000	0.527	0.138	0.544	0.035	0.015	0.286	2.491	0.293	0.019	2.780	7.129
2001	0.544	0.133	0.531	0.036	0.015	0.281	2.453	0.289	0.019	2.738	7.038
2003	0.508	0.139	0.523	0.038	0.015	0.280	2.450	0.288	0.019	2.734	6.995
2008	0.510	0.155	0.523	0.043	0.017	0.288	2.525	0.295	0.021	2.803	7.181
2013	0.502	0.167	0.512	0.048	0.017	0.291	2.548	0.297	0.021	2.814	7.217

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
PG&E Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Large Offices											
GWh by End Use											
1980	693.368	19.819	646.405	12.479	5.145	3.304	1,956.826	79.376	35.932	386.501	3,839.156
1990	1,170.172	65.482	833.598	17.247	6.733	3.928	2,712.037	108.237	138.832	1,280.044	6,336.309
2000	1,373.412	92.225	986.798	21.994	8.429	4.503	3,168.957	134.700	246.507	1,792.985	7,830.510
2001	1,431.173	89.439	975.875	22.175	8.437	4.471	3,162.382	134.948	249.151	1,796.295	7,874.346
2003	1,340.170	98.614	985.636	23.064	8.667	4.542	3,235.224	138.789	259.819	1,847.426	7,941.950
2008	1,425.776	124.423	1,069.808	26.864	9.786	5.062	3,608.693	155.894	301.444	2,075.127	8,802.876
2013	1,448.621	144.719	1,101.026	29.504	10.463	5.392	3,815.390	165.701	329.472	2,205.696	9,255.984
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	3.841	0.110	3.581	0.069	0.028	0.018	10.839	0.440	0.199	2.141	21.266
1990	4.071	0.228	2.900	0.060	0.023	0.014	9.435	0.377	0.483	4.453	22.043
2000	4.212	0.283	3.027	0.067	0.026	0.014	9.719	0.413	0.756	5.499	24.017
2001	4.273	0.267	2.914	0.066	0.025	0.013	9.442	0.403	0.744	5.364	23.512
2003	3.884	0.286	2.856	0.067	0.025	0.013	9.376	0.402	0.753	5.354	23.016
2008	3.856	0.336	2.893	0.073	0.026	0.014	9.759	0.422	0.815	5.612	23.806
2013	3.713	0.371	2.822	0.076	0.027	0.014	9.778	0.425	0.844	5.653	23.721
Miscellaneous											
GWh by End Use											
1980	227.018	19.435	411.476	19.794	2.326	58.459	428.401	101.189	6.384	552.568	1,827.049
1990	469.767	26.613	495.617	21.823	2.312	60.105	474.636	117.986	18.725	1,564.666	3,252.251
2001	562.254	28.506	550.420	26.152	2.625	57.346	510.832	126.652	29.702	1,890.559	3,785.047
2003	537.473	30.051	578.830	27.657	2.755	58.733	528.523	131.465	31.262	1,962.444	3,889.193
2008	585.063	33.837	666.816	32.667	3.220	64.986	592.791	147.095	36.434	2,195.861	4,358.770
2013	615.089	36.423	726.981	36.639	3.558	69.052	635.260	156.200	40.587	2,331.878	4,651.667
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.845	0.072	1.531	0.074	0.009	0.218	1.594	0.377	0.024	2.057	6.800
1990	1.399	0.079	1.476	0.065	0.007	0.179	1.413	0.351	0.056	4.659	9.683
2000	1.447	0.080	1.518	0.071	0.007	0.160	1.417	0.350	0.082	5.227	10.358
2001	1.532	0.078	1.500	0.071	0.007	0.156	1.392	0.345	0.081	5.151	10.312
2003	1.422	0.080	1.531	0.073	0.007	0.155	1.398	0.348	0.083	5.192	10.290
2008	1.444	0.084	1.646	0.081	0.008	0.160	1.463	0.363	0.090	5.419	10.757
2013	1.436	0.085	1.697	0.086	0.008	0.161	1.483	0.365	0.095	5.444	10.859
Restaurants											
GWh by End Use											
1980	92.297	32.253	122.312	11.562	188.046	243.941	302.507	73.136	0.596	222.158	1,288.808
1990	190.023	33.986	137.807	9.278	198.979	260.608	310.888	81.001	1.460	597.523	1,821.553
2000	195.829	30.228	139.531	8.680	193.288	253.127	304.714	79.146	2.194	657.437	1,864.175
2001	206.728	28.128	137.053	8.394	189.303	247.928	297.415	77.627	2.165	644.818	1,839.558
2003	194.608	29.215	144.740	8.234	198.652	259.919	307.806	81.571	2.356	677.701	1,904.802
2008	206.925	31.249	166.869	8.136	225.701	294.627	339.174	92.141	2.866	765.834	2,133.522
2013	214.564	31.691	182.941	7.594	244.414	318.418	357.638	99.072	3.314	823.707	2,283.352
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	2.391	0.835	3.168	0.299	4.871	6.319	7.836	1.894	0.015	5.755	33.384
1990	4.520	0.808	3.278	0.221	4.733	6.199	7.395	1.927	0.035	14.213	43.328
2000	4.519	0.697	3.220	0.200	4.460	5.841	7.031	1.826	0.051	15.170	43.014
2001	4.764	0.648	3.159	0.193	4.363	5.714	6.854	1.789	0.050	14.861	42.395
2003	4.358	0.654	3.242	0.184	4.449	5.821	6.894	1.827	0.053	15.178	42.661
2008	4.275	0.646	3.447	0.168	4.663	6.087	7.007	1.904	0.059	15.822	44.077
2013	4.142	0.612	3.531	0.147	4.718	6.146	6.903	1.912	0.064	15.899	44.074
Retail											
GWh by End Use											
1980	131.647	38.001	113.049	5.251	1.859	37.609	1,345.616	169.098	5.539	135.794	1,983.464
1990	219.599	51.518	141.513	4.826	1.839	39.469	1,526.853	209.755	15.285	409.463	2,620.119
2000	259.516	55.502	164.043	6.223	2.116	39.295	1,644.801	228.938	25.591	504.561	2,930.587
2001	279.165	53.474	162.013	6.197	2.085	38.336	1,603.972	225.242	25.266	496.435	2,892.188
2003	264.354	56.223	167.959	6.784	2.187	39.349	1,631.637	233.316	26.451	514.535	2,942.794
2008	299.366	65.303	194.956	8.706	2.590	44.995	1,803.654	265.353	31.003	586.177	3,302.102
2013	324.231	71.781	212.194	10.176	2.860	48.624	1,882.307	283.379	34.279	626.756	3,496.587
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.600	0.173	0.515	0.024	0.008	0.171	6.132	0.771	0.025	0.619	9.039
1990	0.807	0.189	0.520	0.018	0.007	0.145	5.613	0.771	0.056	1.505	9.632
2000	0.839	0.179	0.530	0.020	0.007	0.127	5.317	0.740	0.083	1.631	9.473
2001	0.894	0.171	0.519	0.020	0.007	0.123	5.139	0.722	0.081	1.591	9.266
2003	0.823	0.175	0.523	0.021	0.007	0.123	5.081	0.727	0.082	1.602	9.164
2008	0.870	0.190	0.566	0.025	0.008	0.131	5.240	0.771	0.090	1.703	9.594
2013	0.889	0.197	0.582	0.028	0.008	0.133	5.159	0.777	0.094	1.718	9.583

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
PG&E Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Refrigerated Warehouses											
GWh by End Use											
1980	0.308	0.197	0.754	0.077	0.001	233.770	19.842	4.386	0.183	24.457	283.975
1990	0.886	0.252	0.961	0.097	0.002	274.203	22.742	6.379	0.630	86.385	392.538
2000	1.342	0.346	1.466	0.153	0.002	350.775	36.246	9.461	1.212	144.226	545.230
2001	1.485	0.338	1.495	0.157	0.003	353.792	37.038	9.638	1.232	146.926	552.105
2003	1.428	0.362	1.570	0.164	0.003	364.761	39.031	10.082	1.283	153.700	572.385
2008	1.583	0.409	1.822	0.192	0.003	412.995	45.989	11.559	1.462	176.222	652.236
2013	1.718	0.445	2.020	0.215	0.004	453.239	51.800	12.700	1.606	193.614	717.361
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.031	0.020	0.075	0.008	0.000	23.350	1.982	0.438	0.018	2.443	28.365
1990	0.054	0.015	0.058	0.006	0.000	16.601	1.377	0.386	0.038	5.230	23.766
2000	0.058	0.015	0.063	0.007	0.000	15.039	1.554	0.406	0.052	6.183	23.375
2001	0.062	0.014	0.062	0.007	0.000	14.691	1.538	0.400	0.051	6.101	22.925
2003	0.057	0.014	0.063	0.007	0.000	14.517	1.553	0.401	0.051	6.117	22.781
2008	0.057	0.015	0.065	0.007	0.000	14.838	1.652	0.415	0.053	6.331	23.433
2013	0.056	0.015	0.066	0.007	0.000	14.881	1.701	0.417	0.053	6.357	23.552
Schools											
GWh by End Use											
1980	15.740	18.535	58.647	51.759	5.031	23.017	436.145	42.072	2.506	23.009	676.462
1990	21.431	17.415	55.769	40.759	4.585	21.419	408.723	41.306	5.414	54.844	671.664
2000	25.260	15.955	75.047	50.891	5.295	24.649	469.269	47.580	9.206	71.143	794.295
2001	27.081	15.012	75.762	51.482	5.268	24.526	466.987	47.405	9.254	70.882	793.659
2003	25.536	14.982	79.664	54.083	5.386	25.060	477.544	48.520	9.632	72.552	812.960
2008	26.829	14.667	92.027	62.922	5.886	27.316	520.002	52.699	10.875	78.816	892.038
2013	27.758	13.581	102.899	71.101	6.239	28.888	549.050	55.441	11.921	82.930	949.807
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.106	0.125	0.395	0.349	0.034	0.155	2.941	0.284	0.017	0.155	4.561
1990	0.139	0.113	0.361	0.264	0.030	0.138	2.642	0.267	0.035	0.355	4.342
2000	0.145	0.092	0.432	0.293	0.030	0.142	2.703	0.274	0.053	0.410	4.575
2001	0.154	0.085	0.431	0.293	0.030	0.139	2.655	0.270	0.053	0.403	4.512
2003	0.142	0.083	0.442	0.300	0.030	0.139	2.651	0.269	0.053	0.403	4.513
2008	0.142	0.077	0.486	0.332	0.031	0.144	2.744	0.278	0.057	0.416	4.707
2013	0.140	0.068	0.518	0.358	0.031	0.146	2.766	0.279	0.060	0.418	4.785
Small Offices											
GWh by End Use											
1980	130.870	21.806	33.721	5.536	0.211	3.036	329.535	105.201	10.382	94.781	735.078
1990	212.316	25.422	41.023	5.606	0.221	2.521	391.286	132.601	38.884	290.059	1,139.937
2000	250.217	30.467	50.170	7.152	0.287	3.037	450.761	163.844	67.976	403.582	1,427.493
2001	265.853	28.865	49.057	7.053	0.282	2.950	440.390	160.937	67.095	396.421	1,418.903
2003	248.234	31.034	50.124	7.397	0.292	3.035	449.073	165.735	69.841	408.264	1,433.029
2008	275.789	37.984	57.164	9.010	0.346	3.630	508.829	190.323	82.138	468.914	1,634.126
2013	296.882	43.455	62.028	10.288	0.387	4.111	548.346	207.677	91.159	511.736	1,776.070
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	1.884	0.314	0.485	0.080	0.003	0.044	4.744	1.514	0.149	1.364	10.581
1990	2.146	0.257	0.415	0.057	0.002	0.025	3.955	1.340	0.393	2.932	11.522
2000	2.222	0.271	0.446	0.064	0.003	0.027	4.004	1.455	0.604	3.585	12.679
2001	2.339	0.254	0.432	0.062	0.002	0.026	3.875	1.416	0.590	3.488	12.484
2003	2.114	0.264	0.427	0.063	0.002	0.026	3.824	1.411	0.595	3.477	12.204
2008	2.139	0.295	0.443	0.070	0.003	0.028	3.946	1.476	0.637	3.637	12.674
2013	2.125	0.311	0.444	0.074	0.003	0.029	3.926	1.487	0.653	3.664	12.715
Warehouses											
GWh by End Use											
1980	20.210	33.216	134.033	0.488	0.012	0.000	235.992	52.320	1.606	291.692	769.569
1990	109.637	59.229	188.602	0.446	0.022	0.000	348.843	78.334	6.574	1,060.726	1,852.412
2000	150.613	80.497	240.753	0.583	0.030	0.000	442.800	101.610	11.689	1,548.859	2,577.433
2001	162.513	78.241	243.218	0.589	0.031	0.000	448.416	103.018	11.910	1,570.333	2,618.268
2003	156.214	84.496	252.918	0.609	0.033	0.000	466.489	107.359	12.507	1,636.539	2,717.165
2008	170.502	97.312	283.004	0.682	0.038	0.000	524.514	120.432	14.313	1,835.911	3,046.709
2013	182.143	107.108	302.884	0.731	0.043	0.000	567.110	129.425	15.714	1,973.077	3,278.236
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.169	0.278	1.121	0.004	0.000	0.000	1.974	0.438	0.013	2.440	6.439
1990	0.543	0.293	0.933	0.002	0.000	0.000	1.726	0.388	0.033	5.249	9.166
2000	0.604	0.323	0.965	0.002	0.000	0.000	1.776	0.407	0.047	6.211	10.336
2001	0.634	0.305	0.948	0.002	0.000	0.000	1.748	0.402	0.046	6.123	10.209
2003	0.585	0.317	0.948	0.002	0.000	0.000	1.748	0.402	0.047	6.133	10.182
2008	0.588	0.336	0.977	0.002	0.000	0.000	1.810	0.416	0.049	6.336	10.515
2013	0.587	0.345	0.977	0.002	0.000	0.000	1.829	0.417	0.051	6.362	10.570

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
SMUD Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Colleges											
GWh by End Use											
1980	9.076	0.000	7.138	0.040	0.111	0.138	19.830	0.778	0.420	1.368	38.898
1990	9.842	0.114	7.229	0.017	0.113	0.140	16.479	0.801	1.349	2.524	38.610
2000	9.148	0.234	8.195	0.017	0.131	0.162	19.291	0.941	1.648	3.217	42.984
2001	10.245	0.228	8.318	0.017	0.131	0.163	19.703	0.949	1.661	3.250	44.664
2003	9.998	0.259	8.472	0.016	0.134	0.166	20.259	0.972	1.700	3.346	45.323
2008	10.246	0.327	8.823	0.015	0.140	0.174	21.591	1.017	1.779	3.548	47.660
2013	10.385	0.401	9.075	0.014	0.144	0.179	22.733	1.048	1.834	3.704	49.515
Average Consumption per Square Foot by End Use (kWh/SF)											
1980	1.846	0.000	1.451	0.008	0.023	0.028	4.032	0.158	0.085	0.278	7.910
1990	1.654	0.019	1.215	0.003	0.019	0.024	2.769	0.135	0.227	0.424	6.487
2000	1.389	0.036	1.244	0.003	0.020	0.025	2.929	0.143	0.250	0.489	6.526
2001	1.525	0.034	1.238	0.002	0.020	0.024	2.932	0.141	0.247	0.484	6.646
2003	1.461	0.038	1.238	0.002	0.020	0.024	2.961	0.142	0.249	0.489	6.624
2008	1.428	0.046	1.229	0.002	0.019	0.024	3.009	0.142	0.248	0.494	6.641
2013	1.390	0.054	1.215	0.002	0.019	0.024	3.043	0.140	0.245	0.496	6.628
Food Stores											
GWh by End Use											
1980	15.422	0.609	26.692	0.138	0.488	84.075	87.919	8.030	0.162	41.529	265.065
1990	35.311	0.970	30.933	0.388	0.524	90.205	91.781	8.743	0.412	93.539	352.806
2000	28.878	1.181	33.802	0.590	0.556	95.643	93.428	9.383	0.485	100.449	364.398
2001	32.303	1.115	34.437	0.629	0.567	97.514	93.202	9.585	0.494	102.620	372.464
2003	31.383	1.198	35.498	0.678	0.584	100.467	93.768	9.898	0.505	105.978	379.958
2008	31.495	1.289	37.049	0.775	0.607	104.497	93.402	10.314	0.520	110.453	390.400
2013	31.365	1.365	37.911	0.863	0.618	106.547	91.800	10.525	0.530	112.727	394.252
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	3.302	0.130	5.716	0.030	0.104	18.004	18.827	1.720	0.035	8.893	56.760
1990	5.789	0.159	5.071	0.064	0.086	14.788	15.046	1.433	0.067	15.334	57.837
2000	4.444	0.182	5.201	0.091	0.086	14.717	14.376	1.444	0.075	15.457	56.072
2001	4.814	0.166	5.132	0.094	0.084	14.533	13.890	1.429	0.074	15.294	55.510
2003	4.607	0.176	5.211	0.099	0.086	14.749	13.766	1.453	0.074	15.558	55.781
2008	4.478	0.183	5.268	0.110	0.086	14.859	13.281	1.467	0.074	15.706	55.513
2013	4.305	0.187	5.203	0.118	0.085	14.623	12.599	1.444	0.073	15.471	54.109
Hospitals											
GWh by End Use											
1980	47.177	3.535	21.955	0.056	0.650	1.005	72.032	2.276	1.726	48.259	198.672
1990	101.457	3.511	29.888	1.196	0.888	1.370	98.330	3.155	5.730	138.643	384.169
2000	119.126	4.459	43.509	2.784	1.285	1.982	142.005	4.621	8.727	203.054	531.551
2001	130.405	4.013	42.901	2.772	1.266	1.953	139.953	4.559	8.609	200.313	536.745
2003	130.513	4.201	44.637	3.022	1.318	2.034	145.734	4.757	8.984	209.036	554.236
2008	140.485	4.283	48.137	3.591	1.421	2.195	157.214	5.143	9.712	226.001	598.182
2013	149.594	4.304	51.098	4.139	1.507	2.329	166.960	5.466	10.323	240.210	635.930
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	9.156	0.686	4.261	0.011	0.126	0.195	13.980	0.442	0.335	9.366	38.559
1990	12.037	0.417	3.546	0.142	0.105	0.163	11.666	0.374	0.680	16.448	45.577
2000	10.207	0.382	3.728	0.239	0.110	0.170	12.168	0.396	0.748	17.399	45.547
2001	11.164	0.344	3.673	0.237	0.108	0.167	11.981	0.390	0.737	17.148	45.950
2003	10.783	0.347	3.688	0.250	0.109	0.168	12.040	0.393	0.742	17.270	45.790
2008	10.702	0.326	3.667	0.274	0.108	0.167	11.977	0.392	0.740	17.217	45.571
2013	10.596	0.305	3.619	0.293	0.107	0.165	11.826	0.387	0.731	17.014	45.044
Hotel/Motel											
GWh by End Use											
1980	3.039	1.283	6.466	0.000	0.155	2.313	20.458	2.238	0.061	8.165	44.180
1990	6.393	1.818	7.364	0.000	0.186	2.768	23.616	2.727	0.139	20.616	65.626
2000	5.152	2.059	7.215	0.000	0.187	2.782	23.867	2.782	0.147	21.030	65.222
2001	5.768	1.995	7.345	0.000	0.193	2.870	24.676	2.876	0.152	21.743	67.619
2003	5.703	2.242	7.575	0.000	0.204	3.023	25.990	3.037	0.161	22.962	70.896
2008	5.946	2.640	7.948	0.000	0.223	3.309	28.461	3.333	0.176	25.195	77.230
2013	6.159	2.990	8.257	0.000	0.239	3.552	30.560	3.582	0.189	27.080	82.608
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.482	0.203	1.025	0.000	0.025	0.367	3.242	0.355	0.010	1.294	7.002
1990	0.752	0.214	0.866	0.000	0.022	0.326	2.778	0.321	0.016	2.425	7.721
2000	0.593	0.237	0.830	0.000	0.022	0.320	2.747	0.320	0.017	2.421	7.507
2001	0.653	0.226	0.831	0.000	0.022	0.325	2.792	0.325	0.017	2.460	7.651
2003	0.615	0.242	0.817	0.000	0.022	0.326	2.803	0.328	0.017	2.476	7.646
2008	0.584	0.259	0.780	0.000	0.022	0.325	2.794	0.327	0.017	2.474	7.582
2013	0.558	0.271	0.749	0.000	0.022	0.322	2.771	0.325	0.017	2.455	7.490

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
SMUD Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Large Offices											
GWh by End Use											
1980	47.607	3.381	81.274	0.138	0.506	0.325	197.715	7.759	10.425	39.712	388.843
1990	152.584	7.349	115.736	0.282	0.832	0.479	323.736	12.843	55.716	138.944	808.501
2000	190.822	15.078	153.221	0.524	1.239	0.658	451.597	19.266	82.187	216.908	1,131.501
2001	212.713	14.095	151.905	0.533	1.242	0.656	451.055	19.340	82.458	217.743	1,151.740
2003	217.533	16.175	157.282	0.585	1.323	0.690	475.907	20.652	87.959	232.505	1,210.610
2008	237.614	18.866	164.190	0.676	1.441	0.745	511.699	22.531	95.816	253.670	1,307.249
2013	260.983	21.743	172.357	0.775	1.571	0.813	552.279	24.572	104.494	276.647	1,416.234
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	3.207	0.228	5.475	0.009	0.034	0.022	13.320	0.523	0.702	2.675	26.197
1990	5.021	0.242	3.809	0.009	0.027	0.016	10.653	0.423	1.833	4.572	26.606
2000	4.665	0.369	3.746	0.013	0.030	0.016	11.041	0.471	2.009	5.303	27.663
2001	5.108	0.338	3.648	0.013	0.030	0.016	10.831	0.464	1.980	5.229	27.657
2003	4.944	0.368	3.574	0.013	0.030	0.016	10.816	0.469	1.999	5.284	27.513
2008	4.936	0.392	3.411	0.014	0.030	0.015	10.630	0.468	1.991	5.270	27.157
2013	4.896	0.408	3.233	0.015	0.029	0.015	10.361	0.461	1.960	5.190	26.569
Miscellaneous											
GWh by End Use											
1980	23.110	7.461	29.098	0.619	0.000	4.850	36.128	8.311	1.036	47.713	158.324
1990	42.636	6.077	35.143	2.678	0.000	5.349	41.334	10.310	3.141	122.583	269.251
2001	37.159	4.779	39.484	4.576	0.000	5.489	47.753	11.898	3.749	141.486	296.374
2003	35.825	4.795	41.331	5.245	0.000	5.711	50.293	12.568	3.932	149.465	309.165
2008	35.088	4.366	44.402	6.751	0.000	6.156	55.014	13.740	4.253	163.415	333.184
2013	33.916	3.908	46.090	7.972	0.000	6.470	58.258	14.463	4.476	172.027	347.581
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	1.228	0.397	1.547	0.033	0.000	0.258	1.920	0.442	0.055	2.536	8.415
1990	1.579	0.225	1.302	0.099	0.000	0.198	1.531	0.382	0.116	4.540	9.972
2000	1.127	0.177	1.310	0.147	0.000	0.183	1.580	0.394	0.125	4.682	9.724
2001	1.222	0.157	1.299	0.151	0.000	0.181	1.571	0.391	0.123	4.654	9.749
2003	1.132	0.151	1.305	0.166	0.000	0.180	1.589	0.397	0.124	4.721	9.765
2008	1.023	0.127	1.295	0.197	0.000	0.180	1.604	0.401	0.124	4.766	9.717
2013	0.932	0.107	1.266	0.219	0.000	0.178	1.600	0.397	0.123	4.726	9.548
Restaurants											
GWh by End Use											
1980	14.085	1.102	17.235	0.321	18.861	24.457	29.883	7.252	0.155	23.206	136.557
1990	30.598	1.792	20.715	0.352	22.913	29.635	34.277	8.937	0.445	58.810	208.475
2000	22.509	2.091	19.886	0.436	22.235	28.724	32.936	8.794	0.481	58.014	196.106
2001	24.542	1.946	19.763	0.446	22.158	28.625	32.527	8.779	0.478	57.932	197.196
2003	24.165	2.267	21.172	0.519	24.006	31.023	34.261	9.547	0.516	63.052	210.528
2008	24.710	2.695	23.061	0.637	26.569	34.363	36.425	10.603	0.565	70.128	229.757
2013	25.126	3.023	24.406	0.727	28.433	36.788	38.102	11.369	0.606	75.258	243.840
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	4.505	0.352	5.512	0.103	6.033	7.823	9.558	2.320	0.050	7.422	43.677
1990	7.200	0.422	4.874	0.083	5.391	6.973	8.065	2.103	0.105	13.838	49.053
2000	5.149	0.478	4.549	0.100	5.087	6.571	7.534	2.012	0.110	13.271	44.861
2001	5.614	0.445	4.521	0.102	5.069	6.548	7.441	2.008	0.109	13.252	45.111
2003	5.269	0.494	4.616	0.113	5.234	6.764	7.470	2.082	0.112	13.748	45.903
2008	4.905	0.535	4.577	0.127	5.274	6.821	7.230	2.105	0.112	13.920	45.604
2013	4.606	0.554	4.474	0.133	5.212	6.743	6.984	2.084	0.111	13.795	44.697
Retail											
GWh by End Use											
1980	50.961	24.184	32.688	0.167	0.301	5.771	204.334	25.449	1.804	21.732	367.390
1990	74.253	19.117	33.458	0.172	0.309	5.464	201.760	26.613	4.394	47.584	413.122
2000	58.265	16.463	33.236	0.236	0.315	5.135	202.287	27.636	5.011	51.594	400.179
2001	64.612	14.823	33.502	0.249	0.321	5.188	203.331	28.199	5.091	52.663	407.979
2003	62.803	15.130	34.408	0.271	0.333	5.333	206.948	29.400	5.262	54.940	414.830
2008	62.089	14.297	35.046	0.306	0.345	5.485	208.331	30.599	5.406	57.240	419.144
2013	61.128	13.221	35.322	0.341	0.355	5.652	209.290	31.518	5.569	59.016	421.413
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	1.964	0.932	1.260	0.006	0.012	0.222	7.876	0.981	0.070	0.838	14.161
1990	2.320	0.597	1.046	0.005	0.010	0.171	6.305	0.832	0.137	1.487	12.910
2000	1.756	0.496	1.001	0.007	0.010	0.155	6.095	0.833	0.151	1.555	12.058
2001	1.890	0.434	0.980	0.007	0.009	0.152	5.948	0.825	0.149	1.541	11.935
2003	1.793	0.432	0.982	0.008	0.010	0.152	5.909	0.839	0.150	1.569	11.845
2008	1.720	0.396	0.971	0.008	0.010	0.152	5.772	0.848	0.150	1.586	11.612
2013	1.621	0.351	0.937	0.009	0.009	0.150	5.551	0.836	0.148	1.565	11.177

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
SMUD Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Refrigerated Warehouses											
GWh by End Use											
1980	0.111	0.008	0.027	0.007	0.000	19.935	1.685	0.370	0.017	2.168	24.328
1990	0.132	0.008	0.018	0.007	0.000	18.588	1.270	0.416	0.028	4.035	24.501
2000	0.125	0.009	0.023	0.008	0.000	18.034	1.483	0.480	0.034	4.662	24.858
2001	0.143	0.009	0.024	0.008	0.000	18.277	1.529	0.493	0.035	4.786	25.303
2003	0.140	0.009	0.024	0.008	0.000	18.465	1.560	0.507	0.035	4.922	25.671
2008	0.147	0.010	0.026	0.008	0.000	19.203	1.652	0.537	0.037	5.221	26.842
2013	0.155	0.010	0.028	0.009	0.000	19.996	1.758	0.561	0.038	5.454	28.010
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.158	0.012	0.038	0.010	0.000	28.240	2.388	0.524	0.024	3.072	34.465
1990	0.138	0.009	0.019	0.007	0.000	19.566	1.336	0.438	0.030	4.247	25.791
2000	0.116	0.009	0.021	0.007	0.000	16.678	1.372	0.444	0.031	4.311	22.989
2001	0.128	0.008	0.021	0.007	0.000	16.427	1.375	0.443	0.031	4.302	22.742
2003	0.124	0.008	0.022	0.007	0.000	16.399	1.386	0.450	0.031	4.371	22.799
2008	0.125	0.008	0.023	0.007	0.000	16.348	1.407	0.458	0.031	4.445	22.852
2013	0.125	0.008	0.023	0.007	0.000	16.182	1.422	0.454	0.031	4.414	22.667
Schools											
GWh by End Use											
1980	1.734	39.931	8.361	0.791	0.310	1.411	26.833	2.538	0.467	1.461	83.838
1990	2.410	40.052	9.891	1.296	0.368	1.671	28.582	3.057	1.757	4.582	93.665
2000	2.574	47.053	12.599	2.123	0.470	2.130	36.619	3.959	2.367	6.183	116.076
2001	2.918	43.537	12.841	2.230	0.479	2.174	37.624	4.048	2.420	6.323	114.594
2003	2.907	45.786	13.299	2.397	0.497	2.256	39.081	4.210	2.517	6.577	119.528
2008	3.087	47.406	14.099	2.755	0.529	2.401	41.816	4.493	2.686	7.023	126.296
2013	3.237	48.645	14.677	3.089	0.553	2.510	43.981	4.706	2.813	7.357	131.568
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.230	5.290	1.108	0.105	0.041	0.187	3.555	0.336	0.062	0.194	11.106
1990	0.235	3.908	0.965	0.126	0.036	0.163	2.788	0.298	0.171	0.447	9.138
2000	0.200	3.654	0.978	0.165	0.036	0.165	2.844	0.307	0.184	0.480	9.015
2001	0.220	3.277	0.967	0.168	0.036	0.164	2.832	0.305	0.182	0.476	8.625
2003	0.211	3.330	0.967	0.174	0.036	0.164	2.843	0.306	0.183	0.478	8.694
2008	0.210	3.225	0.959	0.187	0.036	0.163	2.844	0.306	0.183	0.478	8.591
2013	0.209	3.135	0.946	0.199	0.036	0.162	2.834	0.303	0.181	0.474	8.479
Small Offices											
GWh by End Use											
1980	59.150	15.460	9.768	0.919	0.062	0.848	93.394	29.177	7.126	27.658	243.563
1990	92.368	13.197	10.310	0.846	0.045	0.779	91.451	29.391	23.178	58.748	320.313
2000	74.797	15.063	11.046	1.084	0.049	0.749	91.426	31.449	24.387	65.463	315.514
2001	80.404	13.472	10.743	1.084	0.049	0.723	88.513	30.634	23.741	63.767	313.130
2003	80.373	16.566	11.907	1.444	0.058	0.805	96.478	34.938	27.050	72.753	342.374
2008	80.973	19.248	12.860	1.913	0.068	0.873	101.286	38.340	29.638	79.872	365.071
2013	81.498	21.494	13.600	2.320	0.077	0.934	104.874	40.916	31.629	85.267	382.609
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	3.704	0.968	0.612	0.058	0.004	0.053	5.849	1.827	0.446	1.732	15.253
1990	4.620	0.660	0.516	0.042	0.002	0.039	4.574	1.470	1.159	2.939	16.022
2000	3.684	0.742	0.544	0.053	0.002	0.037	4.503	1.549	1.201	3.224	15.541
2001	3.960	0.664	0.529	0.053	0.002	0.036	4.360	1.509	1.169	3.141	15.424
2003	3.773	0.778	0.559	0.068	0.003	0.038	4.529	1.640	1.270	3.416	16.073
2008	3.461	0.823	0.550	0.082	0.003	0.037	4.329	1.639	1.267	3.414	15.603
2013	3.217	0.848	0.537	0.092	0.003	0.037	4.139	1.615	1.248	3.365	15.101
Warehouses											
GWh by End Use											
1980	3.062	1.128	9.446	0.043	0.003	0.000	27.154	5.927	0.312	34.749	81.824
1990	21.883	6.762	22.419	0.065	0.004	0.000	49.877	11.161	0.951	108.456	221.576
2000	21.824	9.072	27.230	0.078	0.005	0.000	58.174	13.002	1.162	126.383	256.930
2001	25.086	8.761	28.361	0.082	0.006	0.000	60.142	13.456	1.195	130.801	267.890
2003	26.281	10.173	31.382	0.091	0.006	0.000	65.305	14.713	1.290	143.027	292.267
2008	29.939	12.281	36.577	0.106	0.007	0.000	74.003	16.788	1.445	163.224	334.371
2013	33.441	14.317	41.172	0.119	0.008	0.000	82.106	18.528	1.595	180.160	371.447
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.272	0.100	0.838	0.004	0.000	0.000	2.409	0.526	0.028	3.082	7.258
1990	0.864	0.267	0.885	0.003	0.000	0.000	1.968	0.440	0.038	4.280	8.744
2000	0.749	0.312	0.935	0.003	0.000	0.000	1.998	0.447	0.040	4.340	8.823
2001	0.831	0.290	0.939	0.003	0.000	0.000	1.992	0.446	0.040	4.332	8.872
2003	0.811	0.314	0.968	0.003	0.000	0.000	2.015	0.454	0.040	4.413	9.017
2008	0.822	0.337	1.005	0.003	0.000	0.000	2.033	0.461	0.040	4.484	9.185
2013	0.825	0.353	1.016	0.003	0.000	0.000	2.025	0.457	0.039	4.444	9.163

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
SCE Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Colleges											
GWh by End Use											
1980	167.408	32.854	127.688	7.344	4.222	29.974	216.484	15.721	4.337	70.586	676.618
1990	226.426	64.461	146.808	16.643	5.161	36.215	250.007	19.373	10.008	104.445	879.548
2000	248.505	90.943	178.486	31.938	6.399	44.959	307.210	24.079	16.033	134.866	1,083.417
2001	230.936	118.020	180.966	33.550	6.384	44.860	310.542	24.067	16.155	135.443	1,100.924
2003	251.198	109.891	189.115	37.296	6.638	46.659	323.516	25.093	17.031	142.242	1,148.679
2008	276.844	134.551	209.584	46.618	7.405	52.137	356.240	28.024	19.420	161.128	1,291.949
2013	288.478	150.777	220.089	52.485	7.747	54.595	371.717	29.305	20.644	170.303	1,366.139
Average Consumption per Square Foot by End Use (kWh/SF)											
1980	2.806	0.551	2.140	0.123	0.071	0.502	3.628	0.263	0.073	1.183	11.340
1990	3.060	0.871	1.984	0.225	0.070	0.489	3.379	0.262	0.135	1.412	11.888
2000	2.815	1.030	2.022	0.362	0.072	0.509	3.480	0.273	0.182	1.528	12.273
2001	2.584	1.321	2.025	0.375	0.071	0.502	3.475	0.269	0.181	1.516	12.319
2003	2.740	1.199	2.063	0.407	0.072	0.509	3.529	0.274	0.186	1.552	12.529
2008	2.861	1.391	2.166	0.482	0.077	0.539	3.682	0.290	0.201	1.665	13.354
2013	2.842	1.485	2.168	0.517	0.076	0.538	3.662	0.289	0.203	1.678	13.458
Food Stores											
GWh by End Use											
1980	36.987	11.375	116.385	2.243	2.523	1,245.227	692.851	113.542	1.775	67.311	2,290.219
1990	55.058	19.178	155.820	2.278	3.200	1,645.297	911.101	153.465	4.073	137.243	3,086.714
2000	58.159	20.123	171.335	2.781	3.663	1,834.777	974.483	171.465	6.434	159.884	3,403.104
2001	58.398	24.775	166.761	2.750	3.596	1,787.565	935.965	167.301	6.250	156.531	3,309.892
2003	58.994	22.647	174.501	2.936	3.777	1,878.094	951.198	176.288	6.533	166.277	3,441.244
2008	65.901	27.088	199.381	3.475	4.335	2,171.393	1,031.567	203.889	7.513	195.462	3,910.004
2013	68.493	29.449	209.491	3.745	4.623	2,302.259	1,049.223	216.343	8.103	209.640	4,101.368
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.650	0.200	2.045	0.039	0.044	21.876	12.172	1.995	0.031	1.183	40.235
1990	0.720	0.251	2.039	0.030	0.042	21.530	11.923	2.008	0.053	1.796	40.393
2000	0.650	0.225	1.914	0.031	0.041	20.500	10.888	1.916	0.072	1.786	38.023
2001	0.642	0.272	1.832	0.030	0.040	19.639	10.283	1.838	0.069	1.720	36.365
2003	0.628	0.241	1.857	0.031	0.040	19.985	10.122	1.876	0.070	1.769	36.619
2008	0.652	0.268	1.972	0.034	0.043	21.476	10.203	2.017	0.074	1.933	38.671
2013	0.631	0.271	1.930	0.034	0.043	21.205	9.664	1.993	0.075	1.931	37.777
Hospitals											
GWh by End Use											
1980	364.870	26.362	123.382	0.102	4.877	19.093	533.629	17.094	23.128	268.669	1,381.206
1990	694.291	65.319	186.094	18.896	7.734	29.877	835.432	27.375	54.829	631.120	2,550.968
2000	830.938	83.446	236.256	34.514	9.944	38.293	1,066.418	35.263	71.202	817.030	3,223.305
2001	770.279	102.739	231.319	34.442	9.740	37.517	1,044.471	34.585	69.874	801.607	3,136.572
2003	843.307	91.765	238.537	36.904	10.045	38.734	1,077.884	35.760	72.338	829.492	3,274.766
2008	961.515	107.343	268.962	45.437	11.373	43.901	1,220.756	40.527	82.234	941.879	3,723.928
2013	1,005.093	114.383	278.352	49.123	11.829	45.659	1,269.283	42.131	85.688	980.537	3,882.077
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	7.552	0.546	2.554	0.002	0.101	0.395	11.044	0.354	0.479	5.561	28.586
1990	9.025	0.849	2.419	0.246	0.101	0.388	10.859	0.356	0.713	8.203	33.158
2000	8.347	0.838	2.373	0.347	0.100	0.385	10.712	0.354	0.715	8.207	32.378
2001	7.604	1.014	2.284	0.340	0.096	0.370	10.311	0.341	0.690	7.913	30.963
2003	8.007	0.871	2.265	0.350	0.095	0.368	10.234	0.340	0.687	7.875	31.092
2008	8.337	0.931	2.332	0.394	0.099	0.381	10.584	0.351	0.713	8.166	32.288
2013	7.734	0.880	2.142	0.378	0.091	0.351	9.767	0.324	0.659	7.545	29.873
Hotel/Motel											
GWh by End Use											
1980	185.978	88.287	47.451	1.235	2.964	55.470	175.442	26.675	0.390	57.275	641.166
1990	365.023	308.247	82.927	12.170	5.766	107.714	338.331	52.461	1.315	146.257	1,420.211
2000	339.797	310.142	85.872	15.351	6.106	113.989	355.530	55.625	1.518	159.207	1,443.137
2001	315.644	399.457	86.186	15.936	6.146	114.727	358.574	56.091	1.540	161.115	1,515.415
2003	335.846	357.559	88.704	17.211	6.350	118.521	370.175	58.123	1.611	167.902	1,522.002
2008	351.650	409.165	95.918	20.382	6.943	129.661	401.614	63.607	1.796	185.753	1,666.488
2013	357.498	443.863	99.573	22.576	7.277	135.962	418.909	66.621	1.903	195.924	1,750.107
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	4.540	2.155	1.158	0.030	0.072	1.354	4.283	0.651	0.010	1.398	15.653
1990	4.575	3.863	1.039	0.153	0.072	1.350	4.240	0.657	0.016	1.833	17.798
2000	3.856	3.520	0.974	0.174	0.069	1.294	4.035	0.631	0.017	1.807	16.377
2001	3.533	4.471	0.965	0.178	0.069	1.284	4.014	0.628	0.017	1.803	16.963
2003	3.643	3.879	0.962	0.187	0.069	1.286	4.015	0.630	0.017	1.821	16.510
2008	3.567	4.151	0.973	0.207	0.070	1.315	4.074	0.645	0.018	1.884	16.906
2013	3.403	4.225	0.948	0.215	0.069	1.294	3.987	0.634	0.018	1.865	16.657

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
SCE Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Large Offices											
GWh by End Use											
1980	697.830	82.132	578.842	3.669	2.479	3.798	1,781.360	309.064	18.142	289.440	3,766.757
1990	1,404.092	170.247	863.842	14.887	3.811	5.130	2,744.660	479.237	77.598	685.750	6,449.254
2000	1,370.720	188.020	892.209	18.827	4.079	5.014	2,913.501	513.750	108.620	754.256	6,768.994
2001	1,202.306	227.926	867.474	18.820	3.985	4.863	2,826.881	502.567	106.008	740.298	6,501.127
2003	1,370.857	200.394	893.793	20.771	4.164	5.028	2,911.687	526.788	110.908	782.219	6,826.610
2008	1,498.772	233.010	963.628	25.460	4.606	5.495	3,137.966	583.272	123.557	881.140	7,456.906
2013	1,532.268	251.260	965.554	28.769	4.745	5.646	3,190.830	600.520	130.769	921.844	7,632.205
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	3.645	0.429	3.024	0.019	0.013	0.020	9.305	1.614	0.095	1.512	19.677
1990	4.561	0.553	2.806	0.048	0.012	0.017	8.916	1.557	0.252	2.228	20.950
2000	3.908	0.536	2.544	0.054	0.012	0.014	8.307	1.465	0.310	2.151	19.300
2001	3.337	0.633	2.408	0.052	0.011	0.013	7.846	1.395	0.294	2.055	18.045
2003	3.614	0.528	2.356	0.055	0.011	0.013	7.676	1.389	0.292	2.062	17.997
2008	3.552	0.552	2.284	0.060	0.011	0.013	7.436	1.382	0.293	2.088	17.671
2013	3.262	0.535	2.056	0.061	0.010	0.012	6.793	1.278	0.278	1.962	16.248
Miscellaneous											
GWh by End Use											
1980	716.246	96.040	311.068	14.565	3.723	16.893	1,003.578	269.078	14.819	150.699	2,596.708
1990	1,167.322	152.537	438.080	24.752	5.084	20.687	1,386.352	378.323	33.893	265.261	3,872.291
2001	1,099.950	203.850	507.937	33.321	5.925	21.096	1,635.620	435.596	46.980	316.455	4,306.729
2003	1,201.739	183.013	540.420	36.443	6.294	22.190	1,713.010	463.825	49.342	338.901	4,555.177
2008	1,335.544	212.311	617.865	44.002	7.120	24.985	1,908.612	529.259	55.499	391.258	5,126.455
2013	1,378.016	225.411	647.357	48.163	7.440	26.010	1,986.183	552.708	58.978	412.748	5,343.013
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	3.047	0.409	1.323	0.062	0.016	0.072	4.270	1.145	0.063	0.641	11.047
1990	3.548	0.464	1.332	0.075	0.015	0.063	4.214	1.150	0.103	0.806	11.770
2000	2.877	0.402	1.251	0.081	0.015	0.052	4.065	1.073	0.116	0.777	10.708
2001	2.700	0.500	1.247	0.082	0.015	0.052	4.014	1.069	0.115	0.777	10.570
2003	2.862	0.436	1.287	0.087	0.015	0.053	4.080	1.105	0.118	0.807	10.849
2008	2.972	0.473	1.375	0.098	0.016	0.056	4.248	1.178	0.124	0.871	11.409
2013	2.893	0.473	1.359	0.101	0.016	0.055	4.170	1.160	0.124	0.867	11.218
Restaurants											
GWh by End Use											
1980	147.300	9.543	215.357	2.163	34.729	350.787	287.860	144.973	0.196	122.746	1,315.654
1990	268.176	19.515	325.754	1.961	79.096	528.796	415.522	222.513	0.502	282.429	2,144.262
2000	267.104	21.049	367.580	2.389	105.874	603.987	473.732	254.520	0.789	330.887	2,427.913
2001	254.994	26.871	369.970	2.422	108.530	608.714	471.838	256.914	0.792	334.929	2,435.973
2003	272.660	24.440	388.001	2.577	116.804	639.422	486.241	270.496	0.823	354.336	2,555.800
2008	302.368	29.306	444.148	3.079	143.118	738.857	539.430	312.312	0.938	414.021	2,927.578
2013	318.696	33.050	478.268	3.444	164.126	803.751	571.564	339.085	1.035	454.084	3,167.103
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	4.252	0.275	6.217	0.062	1.003	10.126	8.310	4.185	0.006	3.543	37.980
1990	5.076	0.369	6.166	0.037	1.497	10.009	7.865	4.212	0.009	5.346	40.587
2000	4.228	0.333	5.819	0.038	1.676	9.562	7.500	4.029	0.012	5.238	38.436
2001	3.947	0.416	5.726	0.037	1.680	9.422	7.303	3.977	0.012	5.184	37.704
2003	4.041	0.362	5.750	0.038	1.731	9.476	7.206	4.009	0.012	5.251	37.877
2008	4.095	0.397	6.015	0.042	1.938	10.006	7.305	4.230	0.013	5.607	39.647
2013	3.972	0.412	5.960	0.043	2.045	10.017	7.123	4.226	0.013	5.659	39.469
Retail											
GWh by End Use											
1980	356.391	5.406	299.179	3.557	7.295	57.936	1,277.462	251.661	5.971	119.412	2,384.270
1990	548.051	9.957	422.189	6.179	10.528	74.975	1,764.576	366.777	14.552	361.223	3,579.006
2000	572.977	12.403	470.996	9.563	12.111	77.931	1,998.440	422.466	23.304	429.746	4,029.937
2001	542.433	15.595	462.853	9.665	11.941	76.342	1,963.071	417.155	22.876	425.493	3,947.424
2003	574.423	14.121	482.470	10.542	12.515	79.224	2,003.611	438.339	23.749	449.612	4,088.605
2008	633.713	17.723	553.672	13.357	14.579	91.194	2,189.211	510.961	27.335	530.434	4,582.180
2013	663.548	20.305	591.193	15.507	15.806	98.519	2,295.146	553.534	29.961	579.314	4,862.831
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	1.818	0.028	1.526	0.018	0.037	0.295	6.515	1.284	0.030	0.609	12.160
1990	1.932	0.035	1.488	0.022	0.037	0.264	6.220	1.293	0.051	1.273	12.616
2000	1.677	0.036	1.379	0.028	0.035	0.228	5.849	1.237	0.068	1.258	11.795
2001	1.565	0.045	1.335	0.028	0.034	0.220	5.663	1.203	0.066	1.228	11.388
2003	1.603	0.039	1.347	0.029	0.035	0.221	5.592	1.223	0.066	1.255	11.411
2008	1.651	0.046	1.443	0.035	0.038	0.238	5.704	1.331	0.071	1.382	11.938
2013	1.616	0.049	1.439	0.038	0.038	0.240	5.588	1.348	0.073	1.411	11.840

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
SCE Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Refrigerated Warehouses											
GWh by End Use											
1980	1.523	0.034	0.839	0.002	0.004	132.814	30.674	1.919	0.063	11.061	178.934
1990	1.175	0.027	0.556	0.018	0.003	136.572	21.788	1.950	0.115	16.751	178.955
2000	1.315	0.020	0.737	0.066	0.004	189.209	26.337	2.189	0.169	21.111	241.158
2001	1.294	0.024	0.732	0.069	0.004	188.966	25.985	2.160	0.168	20.988	240.389
2003	1.416	0.020	0.838	0.096	0.004	223.440	29.111	2.445	0.195	24.301	281.865
2008	1.547	0.019	0.956	0.126	0.005	265.637	31.953	2.716	0.222	27.824	331.005
2013	1.642	0.017	1.041	0.148	0.006	296.236	34.246	2.881	0.244	30.120	366.580
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.134	0.003	0.074	0.000	0.000	11.716	2.706	0.169	0.006	0.976	15.785
1990	0.097	0.002	0.046	0.001	0.000	11.322	1.806	0.162	0.009	1.389	14.836
2000	0.089	0.001	0.050	0.004	0.000	12.808	1.783	0.148	0.011	1.429	16.324
2001	0.086	0.002	0.049	0.005	0.000	12.625	1.736	0.144	0.011	1.402	16.061
2003	0.092	0.001	0.055	0.006	0.000	14.566	1.898	0.159	0.013	1.584	18.375
2008	0.095	0.001	0.059	0.008	0.000	16.345	1.966	0.167	0.014	1.712	20.367
2013	0.095	0.001	0.060	0.009	0.000	17.185	1.987	0.167	0.014	1.747	21.266
Schools											
GWh by End Use											
1980	133.578	17.039	122.550	3.304	7.788	15.793	477.073	167.218	3.040	39.241	986.625
1990	160.150	20.659	128.779	3.836	8.272	16.202	483.253	179.521	5.540	54.296	1,060.507
2000	179.147	19.579	148.732	7.752	9.612	18.868	555.174	210.230	8.522	66.224	1,223.843
2001	170.761	24.148	147.083	7.932	9.509	18.767	551.582	207.225	8.456	65.508	1,210.973
2003	183.863	21.495	152.916	9.307	9.924	19.634	574.851	216.896	9.038	69.344	1,267.268
2008	203.875	23.110	167.473	12.390	10.943	21.606	626.838	240.697	10.410	78.533	1,395.874
2013	219.288	24.059	178.470	15.459	11.754	23.286	669.497	258.850	11.600	86.126	1,498.390
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.968	0.124	0.888	0.024	0.056	0.114	3.458	1.212	0.022	0.284	7.152
1990	1.075	0.139	0.865	0.026	0.056	0.109	3.245	1.205	0.037	0.365	7.120
2000	1.007	0.110	0.836	0.044	0.054	0.106	3.121	1.182	0.048	0.372	6.880
2001	0.940	0.133	0.810	0.044	0.052	0.103	3.037	1.141	0.047	0.361	6.668
2003	0.974	0.114	0.810	0.049	0.053	0.104	3.044	1.149	0.048	0.367	6.711
2008	1.001	0.113	0.822	0.061	0.054	0.106	3.078	1.182	0.051	0.386	6.854
2013	1.037	0.114	0.844	0.073	0.056	0.110	3.167	1.224	0.055	0.407	7.088
Small Offices											
GWh by End Use											
1980	142.689	2.011	62.706	0.336	1.032	3.743	359.821	79.404	9.143	119.002	779.888
1990	232.249	1.880	88.941	2.354	1.518	4.887	512.766	120.387	35.093	263.677	1,263.751
2000	238.785	1.981	95.290	3.603	1.709	4.996	563.890	135.792	51.069	302.964	1,400.079
2001	235.972	2.410	92.948	3.618	1.690	4.850	551.986	133.055	49.775	297.405	1,373.708
2003	244.023	2.314	96.657	4.089	1.781	5.060	570.047	140.646	52.108	315.728	1,432.454
2008	275.529	3.087	108.654	5.419	2.043	5.804	631.178	162.948	59.792	369.130	1,623.584
2013	293.272	3.567	113.513	6.427	2.194	6.212	662.506	174.364	64.722	397.646	1,724.424
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	2.222	0.031	0.976	0.005	0.016	0.058	5.603	1.236	0.142	1.853	12.144
1990	2.301	0.019	0.881	0.023	0.015	0.048	5.080	1.193	0.348	2.612	12.521
2000	1.991	0.017	0.794	0.030	0.014	0.042	4.701	1.132	0.426	2.526	11.672
2001	1.921	0.020	0.757	0.029	0.014	0.039	4.493	1.083	0.405	2.421	11.183
2003	1.899	0.018	0.752	0.032	0.014	0.039	4.437	1.095	0.406	2.458	11.150
2008	1.950	0.022	0.769	0.038	0.014	0.041	4.467	1.153	0.423	2.612	11.489
2013	1.895	0.023	0.734	0.042	0.014	0.040	4.281	1.127	0.418	2.570	11.144
Warehouses											
GWh by End Use											
1980	41.346	2.929	34.485	0.042	0.071	0.000	717.661	43.557	3.489	156.489	1,000.068
1990	53.121	5.747	48.635	1.256	0.069	0.000	956.978	58.433	8.216	320.983	1,453.437
2000	44.043	6.284	54.738	2.171	0.080	0.000	1,008.931	59.765	9.916	347.515	1,533.443
2001	41.232	8.176	55.892	2.310	0.082	0.000	1,015.299	60.581	10.045	354.447	1,548.063
2003	44.985	7.868	61.307	2.735	0.091	0.000	1,086.535	65.682	10.876	388.777	1,668.856
2008	47.965	9.479	70.947	3.546	0.109	0.000	1,214.270	74.588	12.372	450.247	1,883.523
2013	48.649	10.367	76.312	4.100	0.118	0.000	1,282.644	78.667	13.328	480.951	1,995.136
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.204	0.014	0.170	0.000	0.000	0.000	3.534	0.214	0.017	0.771	4.925
1990	0.192	0.021	0.176	0.005	0.000	0.000	3.454	0.211	0.030	1.158	5.246
2000	0.138	0.020	0.172	0.007	0.000	0.000	3.167	0.188	0.031	1.091	4.813
2001	0.127	0.025	0.172	0.007	0.000	0.000	3.117	0.186	0.031	1.088	4.753
2003	0.133	0.023	0.181	0.008	0.000	0.000	3.202	0.194	0.032	1.146	4.918
2008	0.130	0.026	0.193	0.010	0.000	0.000	3.297	0.203	0.034	1.222	5.114
2013	0.122	0.026	0.192	0.010	0.000	0.000	3.226	0.198	0.034	1.210	5.018

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
LADWP Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Colleges											
GWh by End Use											
1980	154.333	7.119	74.263	2.755	2.485	17.640	127.814	9.266	2.118	31.385	429.178
1990	176.324	9.083	72.799	2.931	2.517	17.829	105.613	9.438	5.495	83.200	485.230
2000	155.318	10.991	72.872	4.174	2.521	17.858	106.148	9.493	14.808	127.947	522.130
2001	139.792	13.874	72.958	4.403	2.525	17.888	106.350	9.510	14.916	128.912	511.129
2003	156.999	15.119	75.849	6.055	2.628	18.617	111.414	9.900	16.024	138.683	551.289
2008	153.546	20.756	77.657	8.423	2.682	19.000	115.309	10.103	17.131	148.508	573.115
2013	148.979	27.459	78.680	11.194	2.707	19.187	118.787	10.206	18.241	158.398	593.839
Average Consumption per Square Foot by End Use (kWh/SF)											
1980	4.120	0.190	1.983	0.074	0.066	0.471	3.412	0.247	0.057	0.838	11.457
1990	4.551	0.234	1.879	0.076	0.065	0.460	2.726	0.244	0.142	2.147	12.524
2000	4.000	0.283	1.877	0.108	0.065	0.460	2.734	0.244	0.381	3.295	13.448
2001	3.600	0.357	1.879	0.113	0.065	0.461	2.739	0.245	0.384	3.320	13.164
2003	3.954	0.381	1.910	0.153	0.066	0.469	2.806	0.249	0.404	3.493	13.885
2008	3.767	0.509	1.905	0.207	0.066	0.466	2.829	0.248	0.420	3.643	14.059
2013	3.563	0.657	1.882	0.268	0.065	0.459	2.841	0.244	0.436	3.788	14.203
Food Stores											
GWh by End Use											
1980	8.115	2.406	32.088	0.380	0.707	350.755	198.581	31.808	0.483	15.123	640.447
1990	13.067	3.526	39.538	0.469	0.834	429.789	233.437	39.514	2.425	29.105	791.704
2000	11.797	3.834	36.540	0.525	0.794	401.773	214.171	36.975	3.534	36.943	746.886
2001	11.039	4.712	36.706	0.538	0.799	404.611	212.689	37.230	3.572	37.620	749.517
2003	12.432	4.263	38.919	0.598	0.859	434.057	217.021	39.922	3.892	41.623	793.586
2008	12.431	4.787	39.941	0.669	0.897	451.884	211.239	41.482	4.160	45.482	812.970
2013	12.203	5.084	39.738	0.703	0.906	454.202	202.833	41.682	4.328	47.367	809.045
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.459	0.136	1.814	0.021	0.040	19.833	11.229	1.799	0.027	0.855	36.214
1990	0.619	0.167	1.874	0.022	0.040	20.371	11.064	1.873	0.115	1.380	37.525
2000	0.539	0.175	1.669	0.024	0.036	18.353	9.784	1.689	0.161	1.688	34.118
2001	0.504	0.215	1.677	0.025	0.037	18.483	9.716	1.701	0.163	1.719	34.239
2003	0.555	0.190	1.739	0.027	0.038	19.390	9.694	1.783	0.174	1.859	35.450
2008	0.541	0.208	1.738	0.029	0.039	19.662	9.191	1.805	0.181	1.979	35.373
2013	0.518	0.216	1.686	0.030	0.038	19.268	8.604	1.768	0.184	2.009	34.321
Hospitals											
GWh by End Use											
1980	96.484	3.318	55.773	0.013	2.197	8.598	240.565	7.710	8.595	97.692	520.945
1990	171.824	3.714	57.310	0.889	2.288	8.915	239.945	8.074	34.520	262.761	790.240
2000	179.269	4.028	57.966	1.497	2.313	8.972	241.657	8.197	56.162	334.680	894.742
2001	164.383	5.077	58.039	1.592	2.317	8.985	241.873	8.213	56.512	336.793	883.784
2003	190.784	5.106	59.467	2.261	2.386	9.243	249.020	8.458	59.404	354.059	940.188
2008	214.914	7.759	62.419	4.179	2.535	9.811	266.254	8.985	66.486	396.294	1,039.635
2013	248.912	11.295	66.330	6.831	2.730	10.571	288.138	9.684	76.023	453.147	1,173.662
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	4.151	0.143	2.399	0.001	0.095	0.370	10.349	0.332	0.370	4.203	22.411
1990	6.964	0.151	2.323	0.036	0.093	0.361	9.725	0.327	1.399	10.650	32.029
2000	7.200	0.162	2.328	0.060	0.093	0.360	9.706	0.329	2.256	13.442	35.936
2001	6.602	0.204	2.331	0.064	0.093	0.361	9.715	0.330	2.270	13.527	35.496
2003	7.557	0.202	2.356	0.090	0.094	0.366	9.864	0.335	2.353	14.025	37.243
2008	7.962	0.287	2.313	0.155	0.094	0.363	9.865	0.333	2.463	14.682	38.518
2013	8.421	0.382	2.244	0.231	0.092	0.358	9.748	0.328	2.572	15.331	39.707
Hotel/Motel											
GWh by End Use											
1980	78.542	35.372	23.487	0.347	1.453	27.184	86.067	13.091	0.199	22.396	288.138
1990	124.180	76.655	30.035	2.839	2.008	37.505	112.110	18.226	0.550	52.114	456.221
2000	101.762	85.457	27.740	3.752	1.909	35.665	107.499	17.389	0.739	65.982	447.895
2001	90.731	103.587	27.412	3.828	1.893	35.357	106.587	17.242	0.739	66.013	453.389
2003	107.944	101.694	30.523	5.122	2.154	40.243	120.990	19.629	0.871	77.818	506.988
2008	107.686	113.466	31.173	6.129	2.246	41.941	126.206	20.454	0.945	84.404	534.649
2013	106.589	121.937	31.456	6.872	2.298	42.929	129.418	20.944	0.993	88.717	552.153
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	3.649	1.643	1.091	0.016	0.067	1.263	3.998	0.608	0.009	1.040	13.386
1990	4.160	2.568	1.006	0.095	0.067	1.257	3.756	0.611	0.018	1.746	15.284
2000	3.286	2.760	0.896	0.121	0.062	1.152	3.471	0.562	0.024	2.131	14.464
2001	2.930	3.345	0.885	0.124	0.061	1.142	3.442	0.557	0.024	2.132	14.641
2003	3.384	3.188	0.957	0.161	0.068	1.262	3.793	0.615	0.027	2.439	15.893
2008	3.226	3.399	0.934	0.184	0.067	1.257	3.781	0.613	0.028	2.529	16.018
2013	3.088	3.533	0.911	0.199	0.067	1.244	3.749	0.607	0.029	2.570	15.996

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
LADWP Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Large Offices											
GWh by End Use											
1980	405.291	49.987	347.131	1.966	1.501	2.299	1,079.341	187.408	10.757	163.298	2,248.978
1990	775.081	82.290	481.269	7.281	2.110	2.930	1,476.901	264.944	146.405	436.837	3,676.047
2000	735.698	85.656	474.950	8.549	2.125	2.688	1,485.264	267.667	243.329	560.352	3,866.278
2001	661.084	104.342	476.043	8.775	2.137	2.680	1,486.600	269.278	245.076	566.963	3,822.978
2003	775.810	94.291	493.581	10.214	2.276	2.803	1,558.424	286.793	263.990	616.285	4,104.467
2008	812.119	106.467	501.773	12.454	2.398	2.898	1,612.027	302.129	284.927	674.214	4,311.406
2013	836.435	116.920	498.540	14.628	2.471	2.977	1,649.605	311.494	304.047	719.470	4,456.587
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	3.292	0.406	2.819	0.016	0.012	0.019	8.766	1.522	0.087	1.326	18.265
1990	4.188	0.445	2.600	0.039	0.011	0.016	7.980	1.432	0.791	2.360	19.862
2000	3.813	0.444	2.461	0.044	0.011	0.014	7.697	1.387	1.261	2.904	20.037
2001	3.426	0.541	2.467	0.045	0.011	0.014	7.704	1.396	1.270	2.938	19.812
2003	3.915	0.476	2.491	0.052	0.011	0.014	7.865	1.447	1.332	3.110	20.713
2008	3.913	0.513	2.418	0.060	0.012	0.014	7.768	1.456	1.373	3.249	20.775
2013	3.841	0.537	2.289	0.067	0.011	0.014	7.574	1.430	1.396	3.303	20.463
Miscellaneous											
GWh by End Use											
1980	187.809	24.114	84.305	3.383	1.012	4.592	280.090	73.180	6.189	35.564	700.239
1990	284.198	30.489	99.738	4.700	1.158	4.813	309.357	87.398	29.911	121.034	972.796
2001	216.581	37.469	94.302	5.807	1.116	4.019	304.950	83.085	52.620	186.850	986.798
2003	245.979	32.814	99.202	6.614	1.178	4.177	317.859	87.568	56.315	202.403	1,054.110
2008	245.785	36.191	102.429	7.831	1.225	4.275	325.064	90.748	60.247	220.432	1,094.228
2013	240.307	38.075	102.729	8.685	1.235	4.301	326.935	91.299	62.931	230.281	1,106.780
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	2.624	0.337	1.178	0.047	0.014	0.064	3.913	1.022	0.086	0.497	9.784
1990	3.492	0.375	1.225	0.058	0.014	0.059	3.801	1.074	0.367	1.487	11.952
2000	2.798	0.359	1.104	0.066	0.013	0.047	3.588	0.972	0.613	2.165	11.726
2001	2.549	0.441	1.110	0.068	0.013	0.047	3.589	0.978	0.619	2.199	11.614
2003	2.862	0.382	1.154	0.077	0.014	0.049	3.698	1.019	0.655	2.355	12.263
2008	2.795	0.412	1.165	0.089	0.014	0.049	3.696	1.032	0.685	2.506	12.442
2013	2.685	0.425	1.148	0.097	0.014	0.048	3.653	1.020	0.703	2.573	12.366
Restaurants											
GWh by End Use											
1980	46.197	3.028	72.092	0.547	10.992	118.336	99.514	49.003	0.068	35.706	435.482
1990	86.084	4.600	91.643	0.490	17.717	150.153	119.074	62.714	0.330	121.411	654.216
2000	74.815	4.684	87.317	0.500	18.951	143.431	117.026	60.139	0.461	147.124	654.448
2001	68.337	5.761	88.613	0.513	19.611	145.793	117.938	61.138	0.469	150.495	658.667
2003	77.117	4.915	91.491	0.543	21.148	151.112	120.027	63.378	0.486	158.158	688.375
2008	77.888	5.414	95.036	0.601	24.182	158.271	121.542	66.364	0.515	171.215	721.028
2013	77.978	5.912	96.556	0.652	27.189	162.243	121.557	68.042	0.547	181.997	742.672
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	3.545	0.232	5.532	0.042	0.843	9.080	7.636	3.760	0.005	2.740	33.416
1990	5.384	0.288	5.732	0.031	1.108	9.392	7.448	3.923	0.021	7.594	40.919
2000	4.504	0.282	5.257	0.030	1.141	8.636	7.046	3.621	0.028	8.858	39.403
2001	4.082	0.344	5.293	0.031	1.171	8.708	7.044	3.652	0.028	8.989	39.342
2003	4.517	0.288	5.359	0.032	1.239	8.850	7.030	3.712	0.028	9.263	40.317
2008	4.422	0.307	5.395	0.034	1.373	8.985	6.900	3.768	0.029	9.720	40.935
2013	4.265	0.323	5.281	0.036	1.487	8.873	6.648	3.721	0.030	9.953	40.616
Retail											
GWh by End Use											
1980	91.453	1.455	88.981	0.825	2.202	17.485	395.399	76.054	1.743	29.372	704.968
1990	149.295	1.791	112.359	1.342	2.784	20.383	456.723	98.558	9.066	166.099	1,018.401
2000	141.453	1.974	105.196	1.836	2.691	17.693	443.866	94.947	13.427	257.824	1,080.906
2001	128.413	2.525	105.942	1.918	2.723	17.749	443.870	96.056	13.617	263.395	1,076.208
2003	146.478	2.324	109.763	2.180	2.864	18.356	452.207	100.895	14.416	282.910	1,132.392
2008	148.256	2.813	111.854	2.595	2.985	18.811	450.390	104.896	15.292	306.569	1,164.462
2013	146.948	3.150	110.751	2.885	3.008	18.897	442.120	105.590	15.850	317.902	1,167.102
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	1.391	0.022	1.353	0.013	0.033	0.266	6.012	1.156	0.027	0.447	10.719
1990	1.824	0.022	1.373	0.016	0.034	0.249	5.581	1.204	0.111	2.030	12.445
2000	1.645	0.023	1.223	0.021	0.031	0.206	5.161	1.104	0.156	2.998	12.567
2001	1.490	0.029	1.229	0.022	0.032	0.206	5.149	1.114	0.158	3.055	12.484
2003	1.662	0.026	1.245	0.025	0.032	0.208	5.130	1.144	0.164	3.209	12.845
2008	1.638	0.031	1.236	0.029	0.033	0.208	4.976	1.159	0.169	3.387	12.866
2013	1.583	0.034	1.193	0.031	0.032	0.204	4.763	1.137	0.171	3.424	12.572

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
LADWP Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Refrigerated Warehouses											
GWh by End Use											
1980	0.414	0.001	0.225	0.001	0.001	59.125	8.216	0.502	0.017	2.400	70.901
1990	0.304	0.001	0.168	0.003	0.001	50.315	6.883	0.484	0.027	4.059	62.245
2000	0.213	0.001	0.134	0.007	0.000	34.276	5.417	0.370	0.027	4.376	44.822
2001	0.195	0.001	0.135	0.008	0.001	34.530	5.379	0.372	0.028	4.526	45.175
2003	0.281	0.001	0.184	0.020	0.001	48.844	6.838	0.505	0.043	6.950	63.666
2008	0.286	0.001	0.190	0.026	0.001	51.607	6.731	0.516	0.046	7.645	67.048
2013	0.287	0.001	0.191	0.030	0.001	53.214	6.606	0.515	0.048	8.020	68.913
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.125	0.000	0.068	0.000	0.000	17.911	2.489	0.152	0.005	0.727	21.479
1990	0.091	0.000	0.050	0.001	0.000	15.087	2.064	0.145	0.008	1.217	18.664
2000	0.064	0.000	0.040	0.002	0.000	10.278	1.624	0.111	0.008	1.312	13.440
2001	0.059	0.000	0.040	0.002	0.000	10.354	1.613	0.112	0.008	1.357	13.546
2003	0.084	0.000	0.055	0.006	0.000	14.598	2.044	0.151	0.013	2.077	19.028
2008	0.085	0.000	0.056	0.008	0.000	15.336	2.000	0.153	0.014	2.272	19.925
2013	0.085	0.000	0.056	0.009	0.000	15.674	1.946	0.152	0.014	2.362	20.298
Schools											
GWh by End Use											
1980	32.435	4.319	33.792	0.682	2.154	4.372	132.216	46.308	0.999	10.195	267.471
1990	40.345	4.215	33.240	0.518	2.110	4.220	119.219	45.970	2.200	26.398	278.434
2000	39.864	4.207	33.495	0.734	2.121	4.248	119.028	46.423	2.952	40.262	293.335
2001	36.400	5.032	33.500	0.765	2.122	4.249	118.944	46.450	2.964	40.442	290.869
2003	41.279	4.082	33.984	0.938	2.163	4.332	120.920	47.351	3.079	42.017	300.144
2008	41.628	3.960	33.605	1.167	2.152	4.317	120.059	47.101	3.153	43.025	300.167
2013	41.727	3.781	32.741	1.438	2.112	4.239	117.985	46.247	3.209	43.798	297.276
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.796	0.106	0.830	0.017	0.053	0.107	3.247	1.137	0.025	0.250	6.568
1990	0.973	0.102	0.802	0.012	0.051	0.102	2.876	1.109	0.053	0.637	6.718
2000	0.958	0.101	0.805	0.018	0.051	0.102	2.860	1.115	0.071	0.967	7.047
2001	0.874	0.121	0.805	0.018	0.051	0.102	2.857	1.116	0.071	0.971	6.987
2003	0.979	0.097	0.806	0.022	0.051	0.103	2.867	1.123	0.073	0.996	7.116
2008	0.977	0.093	0.789	0.027	0.051	0.101	2.817	1.105	0.074	1.010	7.044
2013	0.970	0.088	0.761	0.033	0.049	0.099	2.744	1.076	0.075	1.019	6.914
Small Offices											
GWh by End Use											
1980	38.931	0.655	21.216	0.107	0.342	1.240	119.151	26.362	2.900	39.137	250.040
1990	82.963	0.447	28.610	0.700	0.479	1.615	165.784	37.775	37.528	99.429	455.329
2000	86.105	0.546	29.210	0.986	0.510	1.551	171.505	40.201	65.281	133.545	529.441
2001	79.644	0.670	29.296	1.014	0.514	1.549	171.660	40.502	65.721	135.064	525.632
2003	90.074	0.585	30.157	1.159	0.541	1.600	176.669	42.593	69.188	143.492	556.058
2008	92.494	0.666	30.909	1.438	0.578	1.673	181.910	45.373	74.220	156.042	585.301
2013	94.315	0.742	31.142	1.719	0.606	1.745	186.023	47.524	78.988	166.085	608.888
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	1.723	0.029	0.939	0.005	0.015	0.055	5.273	1.167	0.128	1.732	11.065
1990	2.410	0.013	0.831	0.020	0.014	0.047	4.815	1.097	1.090	2.888	13.225
2000	2.322	0.015	0.788	0.027	0.014	0.042	4.625	1.084	1.761	3.602	14.279
2001	2.145	0.018	0.789	0.027	0.014	0.042	4.623	1.091	1.770	3.637	14.156
2003	2.344	0.015	0.785	0.030	0.014	0.042	4.598	1.108	1.801	3.734	14.471
2008	2.273	0.016	0.759	0.035	0.014	0.041	4.470	1.115	1.824	3.834	14.382
2013	2.174	0.017	0.718	0.040	0.014	0.040	4.287	1.095	1.820	3.828	14.033
Warehouses											
GWh by End Use											
1980	13.478	0.972	10.980	0.014	0.024	0.000	232.943	13.830	1.224	46.684	320.148
1990	15.055	1.454	12.771	0.162	0.017	0.000	248.718	16.036	2.392	102.517	399.122
2000	12.202	1.454	11.484	0.240	0.015	0.000	219.548	13.371	2.888	137.154	398.356
2001	10.971	1.797	11.655	0.263	0.016	0.000	220.253	13.478	2.926	139.979	401.337
2003	12.774	1.752	13.594	0.427	0.019	0.000	249.326	15.337	3.413	165.691	462.334
2008	12.428	1.939	14.361	0.548	0.021	0.000	254.165	15.762	3.592	178.148	480.965
2013	12.181	2.068	14.959	0.654	0.022	0.000	259.605	15.998	3.763	186.677	495.928
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.188	0.014	0.153	0.000	0.000	0.000	3.245	0.193	0.017	0.650	4.460
1990	0.189	0.018	0.160	0.002	0.000	0.000	3.119	0.201	0.030	1.286	5.005
2000	0.152	0.018	0.143	0.003	0.000	0.000	2.741	0.167	0.036	1.712	4.973
2001	0.137	0.022	0.146	0.003	0.000	0.000	2.750	0.168	0.037	1.748	5.011
2003	0.158	0.022	0.169	0.005	0.000	0.000	3.094	0.190	0.042	2.056	5.736
2008	0.152	0.024	0.176	0.007	0.000	0.000	3.119	0.193	0.044	2.186	5.902
2013	0.146	0.025	0.179	0.008	0.000	0.000	3.105	0.191	0.045	2.233	5.931

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
SDG&E Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Colleges											
GWh by End Use											
1980	29.744	12.371	34.773	10.037	4.169	10.738	44.072	3.355	1.567	18.987	169.813
1990	43.826	55.784	47.691	25.329	5.091	13.191	55.938	5.387	5.679	37.886	295.803
2000	46.952	84.047	56.746	40.073	5.140	13.667	74.749	6.649	8.365	47.705	384.093
2001	40.881	110.056	57.591	41.731	5.140	13.698	76.782	6.792	8.545	48.733	409.950
2003	52.059	93.768	59.449	44.890	5.209	13.931	80.804	7.109	8.942	51.004	417.165
2008	58.267	113.694	65.303	54.980	5.541	14.943	93.229	8.157	10.261	58.525	482.899
2013	62.651	128.889	69.285	62.890	5.660	15.344	102.588	8.877	11.166	63.689	531.039
Average Consumption per Square Foot by End Use (kWh/SF)											
1980	2.671	1.111	3.123	0.901	0.374	0.964	3.958	0.301	0.141	1.705	15.252
1990	2.545	3.240	2.770	1.471	0.296	0.766	3.249	0.313	0.330	2.200	17.179
2000	2.105	3.767	2.544	1.796	0.230	0.613	3.351	0.298	0.375	2.138	17.217
2001	1.783	4.799	2.511	1.820	0.224	0.597	3.348	0.296	0.373	2.125	17.875
2003	2.180	3.926	2.489	1.880	0.218	0.583	3.383	0.298	0.374	2.136	17.467
2008	2.206	4.304	2.472	2.081	0.210	0.566	3.529	0.309	0.388	2.216	18.281
2013	2.203	4.532	2.436	2.212	0.199	0.540	3.608	0.312	0.393	2.240	18.674
Food Stores											
GWh by End Use											
1980	9.596	1.901	19.503	0.231	2.047	188.901	117.245	18.843	0.547	13.435	372.249
1990	15.083	5.485	37.880	0.592	7.583	350.088	204.254	35.939	2.247	34.585	693.736
2000	13.160	5.256	42.499	0.864	11.154	412.000	220.431	40.976	3.165	40.360	789.864
2001	11.369	6.721	43.514	0.912	11.762	424.377	223.082	42.201	3.255	41.586	808.779
2003	14.225	5.499	45.278	0.983	12.685	444.119	228.244	44.221	3.400	43.607	842.261
2008	15.431	6.204	51.269	1.197	15.427	505.995	248.646	50.671	3.879	50.053	948.770
2013	16.198	6.658	55.319	1.376	17.700	552.825	261.254	55.279	4.232	54.670	1,025.510
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	1.061	0.210	2.157	0.026	0.226	20.891	12.966	2.084	0.061	1.486	41.167
1990	1.000	0.364	2.511	0.039	0.503	23.204	13.538	2.382	0.149	2.292	45.981
2000	0.676	0.270	2.183	0.044	0.573	21.160	11.321	2.105	0.163	2.073	40.567
2001	0.563	0.333	2.157	0.045	0.583	21.034	11.057	2.092	0.161	2.061	40.086
2003	0.678	0.262	2.159	0.047	0.605	21.176	10.883	2.109	0.162	2.079	40.160
2008	0.677	0.272	2.250	0.053	0.677	22.208	10.913	2.224	0.170	2.197	41.642
2013	0.662	0.272	2.260	0.056	0.723	22.581	10.671	2.258	0.173	2.233	41.888
Hospitals											
GWh by End Use											
1980	128.603	18.605	40.211	14.094	3.477	9.258	168.122	5.500	7.988	89.196	485.054
1990	197.770	82.403	72.749	39.842	6.129	15.582	281.199	9.684	25.017	181.930	912.304
2000	174.911	99.735	82.588	50.909	6.911	16.983	316.176	10.708	31.156	205.284	995.362
2001	150.260	128.368	83.514	52.079	6.981	17.126	319.680	10.815	31.466	207.339	1,007.629
2003	189.997	108.339	87.037	55.483	7.262	17.754	332.353	11.244	32.713	215.578	1,057.762
2008	215.598	130.871	100.374	67.674	8.350	20.250	379.983	12.901	37.533	247.410	1,220.944
2013	237.182	150.870	111.685	78.724	9.264	22.281	421.770	14.264	41.498	273.592	1,361.131
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	9.454	1.368	2.956	1.036	0.256	0.681	12.359	0.404	0.587	6.557	35.657
1990	8.713	3.630	3.205	1.755	0.270	0.686	12.388	0.427	1.102	8.015	40.191
2000	6.522	3.719	3.080	1.898	0.258	0.633	11.790	0.399	1.162	7.655	37.116
2001	5.507	4.704	3.061	1.909	0.256	0.628	11.715	0.396	1.153	7.598	36.927
2003	6.732	3.839	3.084	1.966	0.257	0.629	11.776	0.398	1.159	7.638	37.478
2008	6.929	4.206	3.226	2.175	0.268	0.651	12.212	0.415	1.206	7.951	39.238
2013	6.980	4.440	3.287	2.317	0.273	0.656	12.412	0.420	1.221	8.051	40.056
Hotel/Motel											
GWh by End Use											
1980	70.583	11.573	21.343	1.331	6.826	18.879	57.723	9.015	0.204	23.759	221.235
1990	127.909	63.252	38.424	1.359	11.043	41.485	122.862	20.706	0.964	67.811	495.814
2000	106.145	72.965	40.579	1.124	11.236	46.171	140.426	23.170	1.288	77.405	520.508
2001	90.565	93.585	40.686	1.095	11.256	46.712	142.307	23.468	1.304	78.401	529.379
2003	113.631	79.343	41.990	1.054	11.606	49.250	150.259	24.799	1.378	82.847	556.157
2008	122.692	92.619	45.684	0.964	12.662	56.319	171.517	28.426	1.580	94.965	627.428
2013	129.003	103.519	48.413	0.856	13.428	61.999	189.036	31.343	1.742	104.708	684.047
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	5.930	0.972	1.793	0.112	0.573	1.586	4.849	0.757	0.017	1.996	18.586
1990	4.876	2.411	1.465	0.052	0.421	1.581	4.683	0.789	0.037	2.585	18.900
2000	3.400	2.337	1.300	0.036	0.360	1.479	4.498	0.742	0.041	2.479	16.673
2001	2.844	2.939	1.278	0.034	0.353	1.467	4.469	0.737	0.041	2.462	16.624
2003	3.386	2.364	1.251	0.031	0.346	1.468	4.477	0.739	0.041	2.469	16.572
2008	3.266	2.466	1.216	0.026	0.337	1.499	4.566	0.757	0.042	2.528	16.703
2013	3.138	2.518	1.178	0.021	0.327	1.508	4.599	0.762	0.042	2.547	16.641

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
SDG&E Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Large Offices											
GWh by End Use											
1980	85.947	5.511	86.263	3.541	1.145	1.688	192.922	33.720	3.500	42.105	456.342
1990	217.084	50.134	243.437	9.254	2.833	3.862	596.972	103.888	38.445	161.135	1,427.045
2000	209.173	67.616	287.756	11.367	3.472	4.357	711.408	132.519	59.226	209.700	1,696.595
2001	181.836	89.520	293.145	11.745	3.569	4.444	733.431	137.279	61.505	217.235	1,733.708
2003	229.988	76.652	303.515	12.386	3.739	4.596	771.440	145.229	65.396	229.820	1,842.762
2008	245.435	87.147	327.017	13.691	4.082	4.942	846.740	160.577	72.856	254.118	2,016.605
2013	244.255	89.358	326.976	13.866	4.102	4.940	852.834	162.373	73.670	256.965	2,029.339
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	4.536	0.291	4.553	0.187	0.060	0.089	10.182	1.780	0.185	2.222	24.084
1990	3.628	0.838	4.068	0.155	0.047	0.065	9.976	1.736	0.642	2.693	23.847
2000	2.739	0.885	3.768	0.149	0.045	0.057	9.314	1.735	0.775	2.746	22.213
2001	2.277	1.121	3.671	0.147	0.045	0.056	9.184	1.719	0.770	2.720	21.710
2003	2.723	0.908	3.594	0.147	0.044	0.054	9.134	1.719	0.774	2.721	21.818
2008	2.720	0.966	3.624	0.152	0.045	0.055	9.384	1.780	0.807	2.816	22.350
2013	2.707	0.990	3.624	0.154	0.045	0.055	9.452	1.800	0.816	2.848	22.491
Miscellaneous											
GWh by End Use											
1980	102.673	22.277	38.624	7.059	1.511	2.126	115.238	31.019	2.867	21.878	345.273
1990	171.779	62.321	79.115	7.742	3.158	3.392	216.128	60.070	11.727	52.527	667.959
2001	131.358	82.121	105.182	7.386	4.319	3.859	286.247	78.614	18.663	70.186	787.936
2003	164.702	67.083	110.775	7.521	4.563	4.002	299.171	82.759	19.488	73.895	833.959
2008	178.949	73.582	127.689	8.025	5.304	4.504	339.628	95.247	22.162	85.069	940.161
2013	186.195	77.115	138.779	8.193	5.812	4.838	367.576	103.415	24.062	92.381	1,008.366
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	4.251	0.922	1.599	0.292	0.063	0.088	4.771	1.284	0.119	0.906	14.294
1990	3.749	1.360	1.727	0.169	0.069	0.074	4.717	1.311	0.256	1.146	14.577
2000	2.415	1.020	1.607	0.117	0.066	0.060	4.395	1.201	0.286	1.072	12.239
2001	2.003	1.252	1.604	0.113	0.066	0.059	4.365	1.199	0.285	1.070	12.016
2003	2.412	0.982	1.622	0.110	0.067	0.059	4.381	1.212	0.285	1.082	12.213
2008	2.369	0.974	1.691	0.106	0.070	0.060	4.497	1.261	0.293	1.126	12.448
2013	2.290	0.948	1.707	0.101	0.071	0.059	4.521	1.272	0.296	1.136	12.402
Restaurants											
GWh by End Use											
1980	50.200	2.637	73.691	1.722	49.905	104.507	91.483	45.125	0.134	44.750	464.154
1990	61.414	6.602	98.059	2.064	63.518	137.684	108.022	59.558	0.416	79.807	617.145
2000	45.879	7.421	96.669	2.527	61.058	137.269	106.403	58.739	0.507	80.450	596.922
2001	38.812	9.591	97.088	2.595	61.124	138.133	106.308	59.061	0.509	80.918	594.140
2003	47.402	8.115	99.306	2.764	62.152	141.866	107.429	60.544	0.521	83.007	613.106
2008	48.197	9.569	106.315	3.249	65.641	153.441	111.420	65.058	0.557	89.359	652.806
2013	48.035	10.770	110.336	3.687	67.320	160.851	113.195	67.774	0.580	93.230	675.777
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	4.975	0.261	7.304	0.171	4.946	10.358	9.067	4.472	0.013	4.435	46.003
1990	5.092	0.547	8.131	0.171	5.267	11.417	8.957	4.939	0.035	6.617	51.173
2000	3.477	0.562	7.325	0.191	4.627	10.402	8.063	4.451	0.038	6.096	45.232
2001	2.907	0.718	7.273	0.194	4.579	10.348	7.964	4.424	0.038	6.062	44.508
2003	3.484	0.596	7.299	0.203	4.568	10.428	7.897	4.450	0.038	6.101	45.066
2008	3.413	0.678	7.528	0.230	4.648	10.865	7.890	4.607	0.039	6.327	46.225
2013	3.297	0.739	7.574	0.253	4.621	11.042	7.770	4.652	0.040	6.400	46.388
Retail											
GWh by End Use											
1980	82.479	0.825	58.843	2.676	0.916	6.366	296.813	57.556	2.397	31.977	540.847
1990	123.987	1.858	101.632	4.564	1.691	12.832	453.836	100.796	9.041	76.077	886.315
2000	105.560	2.097	109.633	5.244	2.039	15.435	491.909	111.716	12.379	86.159	942.170
2001	90.690	2.683	111.256	5.369	2.092	15.846	497.157	113.998	12.612	87.937	939.641
2003	113.334	2.212	115.302	5.639	2.202	16.703	511.116	119.120	13.140	91.923	990.690
2008	122.401	2.481	128.976	6.484	2.528	19.503	560.478	135.059	14.833	104.317	1,097.060
2013	127.957	2.657	137.771	7.107	2.779	21.751	592.790	146.053	16.040	112.880	1,167.785
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	1.932	0.019	1.378	0.063	0.021	0.149	6.951	1.348	0.056	0.749	12.666
1990	1.882	0.028	1.542	0.069	0.026	0.195	6.887	1.530	0.137	1.155	13.450
2000	1.282	0.025	1.332	0.064	0.025	0.187	5.976	1.357	0.150	1.047	11.445
2001	1.073	0.032	1.316	0.064	0.025	0.187	5.880	1.348	0.149	1.040	11.114
2003	1.293	0.025	1.315	0.064	0.025	0.190	5.829	1.359	0.150	1.048	11.299
2008	1.293	0.026	1.363	0.069	0.027	0.206	5.922	1.427	0.157	1.102	11.591
2013	1.268	0.026	1.365	0.070	0.028	0.215	5.872	1.447	0.159	1.118	11.569

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
SDG&E Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Refrigerated Warehouses											
GWh by End Use											
1980	0.038	0.002	0.022	0.007	0.000	9.362	0.843	0.051	0.002	0.406	10.732
1990	0.016	0.004	0.011	0.006	0.000	9.093	0.489	0.059	0.002	0.576	10.256
2000	0.031	0.005	0.032	0.010	0.000	13.231	1.225	0.107	0.004	1.066	15.713
2001	0.027	0.007	0.033	0.010	0.000	13.051	1.225	0.106	0.004	1.058	15.521
2003	0.034	0.005	0.035	0.011	0.000	13.442	1.296	0.111	0.004	1.103	16.040
2008	0.039	0.006	0.041	0.012	0.000	15.088	1.514	0.126	0.005	1.251	18.082
2013	0.043	0.006	0.046	0.013	0.000	16.336	1.676	0.136	0.005	1.358	19.620
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.132	0.007	0.076	0.023	0.000	32.439	2.919	0.176	0.005	1.408	37.185
1990	0.051	0.012	0.037	0.019	0.000	29.006	1.560	0.188	0.006	1.836	32.716
2000	0.053	0.009	0.055	0.017	0.000	22.487	2.083	0.182	0.007	1.812	26.705
2001	0.045	0.011	0.055	0.017	0.000	22.169	2.081	0.180	0.007	1.798	26.365
2003	0.056	0.009	0.057	0.017	0.000	21.963	2.117	0.181	0.007	1.802	26.209
2008	0.058	0.009	0.061	0.018	0.000	22.289	2.237	0.185	0.007	1.849	26.712
2013	0.058	0.009	0.063	0.018	0.000	22.418	2.300	0.187	0.007	1.864	26.924
Schools											
GWh by End Use											
1980	53.865	9.501	34.063	12.574	6.805	3.201	108.869	39.261	1.347	12.270	281.756
1990	52.584	17.576	36.824	10.981	7.420	3.294	104.377	43.410	3.865	16.808	297.139
2000	45.782	19.125	42.983	10.763	8.418	3.904	120.877	49.182	5.736	19.438	326.208
2001	39.086	24.273	43.444	10.775	8.484	3.951	122.054	49.627	5.788	19.615	327.097
2003	48.290	19.782	44.718	10.932	8.712	4.079	125.467	51.052	5.954	20.180	339.167
2008	49.785	21.589	48.435	11.528	9.458	4.455	135.688	55.531	6.476	21.958	364.902
2013	50.201	23.022	51.355	11.819	9.992	4.764	143.653	58.737	6.850	23.232	383.625
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	1.926	0.340	1.218	0.450	0.243	0.114	3.892	1.404	0.048	0.439	10.072
1990	1.753	0.586	1.228	0.366	0.247	0.110	3.480	1.447	0.129	0.560	9.906
2000	1.280	0.535	1.202	0.301	0.235	0.109	3.380	1.375	0.160	0.544	9.122
2001	1.076	0.668	1.196	0.297	0.234	0.109	3.360	1.366	0.159	0.540	9.006
2003	1.297	0.531	1.201	0.294	0.234	0.110	3.371	1.371	0.160	0.542	9.112
2008	1.265	0.549	1.231	0.293	0.240	0.113	3.449	1.411	0.165	0.558	9.275
2013	1.217	0.558	1.245	0.287	0.242	0.115	3.483	1.424	0.166	0.563	9.300
Small Offices											
GWh by End Use											
1980	136.560	3.644	62.509	4.360	0.536	2.142	232.089	51.389	8.693	92.970	594.892
1990	152.254	4.472	73.581	3.905	0.658	2.401	269.925	62.640	37.778	154.751	762.363
2000	113.671	4.133	68.422	3.652	0.661	2.088	244.657	60.377	43.976	152.211	693.847
2001	94.172	5.100	66.659	3.583	0.651	2.025	239.417	59.068	43.129	148.915	662.719
2003	118.088	4.362	69.957	3.977	0.747	2.191	256.337	65.098	47.772	164.152	732.680
2008	123.822	4.836	75.429	4.618	0.901	2.485	282.353	74.766	55.283	188.595	813.088
2013	126.836	5.175	78.385	5.115	1.025	2.714	299.950	81.681	60.396	206.087	867.363
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	3.633	0.097	1.663	0.116	0.014	0.057	6.174	1.367	0.231	2.473	15.826
1990	3.256	0.096	1.573	0.084	0.014	0.051	5.772	1.339	0.808	3.309	16.301
2000	2.403	0.087	1.446	0.077	0.014	0.044	5.172	1.276	0.930	3.217	14.667
2001	1.991	0.108	1.409	0.076	0.014	0.043	5.061	1.249	0.912	3.148	14.009
2003	2.397	0.089	1.420	0.081	0.015	0.044	5.203	1.321	0.970	3.332	14.873
2008	2.272	0.089	1.384	0.085	0.017	0.046	5.182	1.372	1.015	3.461	14.922
2013	2.162	0.088	1.336	0.087	0.017	0.046	5.113	1.392	1.030	3.513	14.786
Warehouses											
GWh by End Use											
1980	4.804	0.792	4.983	1.069	0.000	0.000	75.974	4.453	0.591	20.693	113.361
1990	8.514	2.579	11.443	2.348	0.007	0.000	149.941	9.955	1.716	56.244	242.746
2000	8.288	2.697	15.168	2.959	0.013	0.000	185.132	12.339	2.475	71.159	300.229
2001	7.282	3.490	15.988	3.094	0.014	0.000	192.651	12.931	2.594	74.581	312.624
2003	9.186	2.856	16.901	3.243	0.015	0.000	201.065	13.601	2.731	78.450	328.048
2008	9.939	3.117	19.302	3.667	0.019	0.000	223.833	15.416	3.098	88.940	367.330
2013	10.546	3.314	21.410	4.041	0.022	0.000	243.167	16.937	3.404	97.731	400.572
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.239	0.039	0.248	0.053	0.000	0.000	3.787	0.222	0.029	1.031	5.650
1990	0.215	0.065	0.289	0.059	0.000	0.000	3.790	0.252	0.043	1.422	6.136
2000	0.154	0.050	0.281	0.055	0.000	0.000	3.435	0.229	0.046	1.320	5.571
2001	0.128	0.061	0.281	0.054	0.000	0.000	3.389	0.228	0.046	1.312	5.500
2003	0.154	0.048	0.283	0.054	0.000	0.000	3.370	0.228	0.046	1.315	5.498
2008	0.151	0.047	0.292	0.056	0.000	0.000	3.392	0.234	0.047	1.348	5.566
2013	0.147	0.046	0.298	0.056	0.000	0.000	3.381	0.235	0.047	1.359	5.570

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
BGP Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Colleges											
GWh by End Use											
1980	16.621	0.880	22.851	0.348	0.409	4.897	20.517	1.485	0.292	8.000	76.299
1990	18.999	0.674	21.928	0.332	0.401	4.726	19.788	1.445	0.565	12.346	81.204
2000	20.130	1.784	23.824	0.320	0.482	4.885	21.339	1.588	1.052	29.058	104.461
2001	20.423	2.147	23.649	0.313	0.484	4.819	21.160	1.578	1.056	28.914	104.542
2003	21.947	2.067	23.819	0.307	0.496	4.801	21.273	1.592	1.085	29.238	106.625
2008	22.561	2.786	23.858	0.281	0.525	4.650	21.273	1.601	1.154	29.638	108.327
2013	22.991	3.645	23.652	0.245	0.555	4.414	21.118	1.596	1.228	29.826	109.270
Average Consumption per Square Foot by End Use (kWh/SF)											
1980	2.701	0.143	3.713	0.057	0.066	0.796	3.334	0.241	0.047	1.300	12.398
1990	3.018	0.107	3.483	0.053	0.064	0.751	3.143	0.229	0.090	1.961	12.900
2000	3.121	0.277	3.693	0.050	0.075	0.757	3.308	0.246	0.163	4.505	16.194
2001	3.151	0.331	3.648	0.048	0.075	0.743	3.264	0.243	0.163	4.461	16.128
2003	3.382	0.319	3.670	0.047	0.076	0.740	3.278	0.245	0.167	4.505	16.430
2008	3.464	0.428	3.663	0.043	0.081	0.714	3.266	0.246	0.177	4.551	16.633
2013	3.516	0.557	3.617	0.038	0.085	0.675	3.230	0.244	0.188	4.562	16.712
Food Stores											
GWh by End Use											
1980	1.957	2.061	2.691	0.051	0.132	54.767	32.073	5.119	0.082	3.562	102.495
1990	3.298	2.005	3.034	0.070	0.185	63.144	36.065	5.982	0.207	6.724	120.714
2000	3.868	1.862	2.731	0.082	0.196	58.402	32.864	5.599	0.340	13.509	119.453
2001	3.880	2.049	2.677	0.083	0.196	57.483	31.980	5.519	0.337	13.340	117.543
2003	4.196	1.782	2.874	0.099	0.227	63.113	33.228	6.091	0.379	14.847	126.838
2008	4.202	1.711	2.926	0.115	0.255	65.949	32.628	6.407	0.410	15.777	130.380
2013	4.059	1.568	2.829	0.120	0.264	64.970	31.000	6.342	0.417	15.726	127.295
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.685	0.722	0.942	0.018	0.046	19.177	11.230	1.792	0.029	1.247	35.889
1990	1.021	0.621	0.939	0.022	0.057	19.551	11.166	1.852	0.064	2.082	37.375
2000	1.178	0.567	0.832	0.025	0.060	17.785	10.008	1.705	0.104	4.114	36.378
2001	1.182	0.624	0.815	0.025	0.060	17.506	9.739	1.681	0.103	4.062	35.796
2003	1.244	0.528	0.852	0.029	0.067	18.705	9.848	1.805	0.112	4.400	37.592
2008	1.201	0.489	0.836	0.033	0.073	18.845	9.324	1.831	0.117	4.508	37.257
2013	1.160	0.448	0.809	0.034	0.075	18.565	8.858	1.812	0.119	4.494	36.375
Hospitals											
GWh by End Use											
1980	14.282	0.911	9.903	0.043	0.321	1.768	34.299	1.097	1.461	17.789	81.876
1990	27.387	1.599	12.369	2.699	0.423	2.074	43.752	1.410	4.416	41.483	137.612
2000	36.769	2.452	14.511	4.851	0.510	2.319	51.264	1.674	8.374	105.617	228.341
2001	37.452	2.794	14.417	4.969	0.508	2.296	50.950	1.665	8.358	105.184	228.593
2003	40.648	2.520	14.705	5.398	0.520	2.326	52.042	1.704	8.605	107.830	236.298
2008	42.490	2.805	15.093	6.374	0.541	2.349	53.723	1.760	9.036	111.990	246.161
2013	43.957	3.053	15.277	7.279	0.554	2.340	54.778	1.792	9.343	114.648	253.021
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	4.206	0.268	2.916	0.013	0.095	0.521	10.100	0.323	0.430	5.239	24.111
1990	6.156	0.359	2.780	0.607	0.095	0.466	9.834	0.317	0.993	9.324	30.930
2000	7.369	0.491	2.908	0.972	0.102	0.465	10.274	0.336	1.678	21.167	45.762
2001	7.451	0.556	2.868	0.989	0.101	0.457	10.136	0.331	1.663	20.925	45.477
2003	7.952	0.493	2.877	1.056	0.102	0.455	10.181	0.333	1.683	21.095	46.228
2008	8.030	0.530	2.852	1.205	0.102	0.444	10.153	0.333	1.708	21.164	46.520
2013	8.089	0.562	2.811	1.340	0.102	0.431	10.081	0.330	1.719	21.099	46.564
Hotel/Motel											
GWh by End Use											
1980	2.147	2.320	2.003	0.026	0.113	1.710	5.402	0.820	0.014	2.056	16.610
1990	4.042	5.967	2.992	0.025	0.274	2.821	8.916	1.359	0.057	5.640	32.094
2000	4.247	8.034	3.159	0.025	0.330	3.080	9.664	1.491	0.102	13.243	43.375
2001	4.279	9.116	3.130	0.025	0.331	3.061	9.595	1.482	0.102	13.182	44.303
2003	4.611	8.364	3.214	0.025	0.352	3.179	9.924	1.540	0.107	13.744	45.059
2008	4.719	9.446	3.329	0.023	0.389	3.366	10.426	1.632	0.116	14.652	48.099
2013	4.774	10.294	3.395	0.021	0.417	3.494	10.758	1.694	0.122	15.288	50.257
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	1.536	1.660	1.433	0.018	0.081	1.223	3.865	0.586	0.010	1.471	11.885
1990	1.738	2.566	1.287	0.011	0.118	1.213	3.834	0.585	0.024	2.426	13.801
2000	1.688	3.192	1.255	0.010	0.131	1.224	3.840	0.592	0.041	5.262	17.234
2001	1.700	3.622	1.243	0.010	0.132	1.216	3.812	0.589	0.041	5.238	17.603
2003	1.777	3.224	1.239	0.009	0.136	1.226	3.825	0.594	0.041	5.298	17.370
2008	1.715	3.433	1.210	0.008	0.141	1.223	3.789	0.593	0.042	5.325	17.479
2013	1.663	3.586	1.183	0.007	0.145	1.217	3.747	0.590	0.043	5.325	17.505

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
BGP Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Large Offices											
GWh by End Use											
1980	73.602	1.817	89.728	0.303	0.831	2.456	235.847	40.869	1.943	48.579	495.976
1990	109.189	1.687	97.361	0.341	0.820	2.145	256.737	44.630	7.853	95.616	616.376
2000	97.194	1.332	86.603	0.316	0.703	1.603	233.140	40.117	13.375	182.805	657.188
2001	97.261	1.460	84.439	0.312	0.682	1.536	226.444	39.182	13.086	178.694	643.096
2003	115.552	1.738	92.259	0.427	0.717	1.518	254.385	45.594	16.312	210.767	739.270
2008	121.756	2.037	92.178	0.518	0.675	1.318	258.927	48.021	18.288	224.885	768.604
2013	121.443	2.187	87.254	0.574	0.598	1.082	251.809	47.624	19.374	225.565	757.510
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	2.711	0.067	3.305	0.011	0.031	0.090	8.686	1.505	0.072	1.789	18.266
1990	3.568	0.055	3.182	0.011	0.027	0.070	8.390	1.458	0.257	3.125	20.143
2000	3.146	0.043	2.803	0.010	0.023	0.052	7.547	1.299	0.433	5.918	21.274
2001	3.148	0.047	2.733	0.010	0.022	0.050	7.330	1.268	0.424	5.784	20.818
2003	3.640	0.055	2.907	0.013	0.023	0.048	8.014	1.436	0.514	6.640	23.290
2008	3.698	0.062	2.800	0.016	0.021	0.040	7.865	1.459	0.556	6.831	23.347
2013	3.689	0.066	2.650	0.017	0.018	0.033	7.649	1.447	0.589	6.852	23.010
Miscellaneous											
GWh by End Use											
1980	40.027	11.408	21.652	0.379	0.202	1.236	55.075	14.389	0.883	37.158	182.409
1990	57.860	11.267	25.677	0.961	0.241	1.235	62.157	16.669	4.749	91.650	272.465
2001	52.446	11.393	24.844	1.492	0.235	0.980	59.791	15.862	8.966	187.088	363.096
2003	56.070	9.845	26.430	1.853	0.251	0.999	62.487	16.792	9.711	199.352	383.789
2008	54.689	9.371	27.619	2.431	0.265	0.974	63.443	17.366	10.513	208.519	395.190
2013	52.207	8.671	28.059	2.942	0.271	0.937	63.411	17.471	11.180	212.078	397.228
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	2.756	0.786	1.491	0.026	0.014	0.085	3.792	0.991	0.061	2.559	12.560
1990	3.534	0.688	1.568	0.059	0.015	0.075	3.796	1.018	0.290	5.598	16.641
2000	3.093	0.610	1.478	0.085	0.014	0.059	3.583	0.945	0.532	11.132	21.531
2001	3.110	0.676	1.473	0.088	0.014	0.058	3.545	0.941	0.532	11.093	21.529
2003	3.296	0.579	1.553	0.109	0.015	0.059	3.673	0.987	0.571	11.717	22.558
2008	3.160	0.542	1.596	0.140	0.015	0.056	3.666	1.003	0.608	12.049	22.836
2013	2.982	0.495	1.603	0.168	0.015	0.054	3.622	0.998	0.639	12.114	22.689
Restaurants											
GWh by End Use											
1980	6.954	0.412	11.193	0.045	1.953	17.743	14.854	7.272	0.009	6.865	67.299
1990	11.353	0.529	13.708	0.103	3.314	22.016	17.459	9.009	0.022	13.736	91.248
2000	11.689	0.583	13.213	0.138	3.836	21.515	17.088	8.817	0.039	28.773	105.691
2001	11.810	0.662	13.166	0.143	3.912	21.502	16.922	8.811	0.039	28.799	105.766
2003	12.718	0.604	13.623	0.164	4.309	22.455	17.254	9.193	0.041	30.194	110.554
2008	12.836	0.672	14.098	0.206	5.078	23.711	17.388	9.681	0.045	32.123	115.837
2013	12.488	0.701	13.814	0.233	5.499	23.631	16.801	9.621	0.046	32.198	115.032
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	3.472	0.206	5.589	0.022	0.975	8.859	7.417	3.631	0.004	3.428	33.603
1990	4.750	0.221	5.735	0.043	1.387	9.211	7.305	3.769	0.009	5.747	38.178
2000	4.760	0.237	5.380	0.056	1.562	8.761	6.958	3.590	0.016	11.716	43.036
2001	4.792	0.269	5.342	0.058	1.587	8.725	6.866	3.575	0.016	11.685	42.914
2003	5.022	0.238	5.379	0.065	1.702	8.867	6.813	3.630	0.016	11.922	43.654
2008	4.887	0.256	5.367	0.078	1.933	9.027	6.620	3.686	0.017	12.230	44.102
2013	4.755	0.267	5.259	0.089	2.093	8.997	6.397	3.663	0.018	12.258	43.795
Retail											
GWh by End Use											
1980	22.712	1.689	11.254	0.123	0.404	4.261	73.713	14.122	0.318	7.468	136.063
1990	33.781	2.112	12.614	0.131	0.449	4.336	81.296	16.140	0.787	15.420	167.066
2000	28.296	2.171	11.210	0.125	0.402	3.555	73.431	14.799	1.272	30.347	165.609
2001	28.276	2.418	10.983	0.124	0.395	3.470	71.505	14.564	1.258	29.918	162.911
2003	31.126	2.197	11.695	0.137	0.427	3.662	74.477	15.932	1.406	33.002	174.061
2008	30.777	2.237	11.600	0.143	0.428	3.625	72.028	16.216	1.473	33.903	172.431
2013	29.834	2.204	11.253	0.144	0.420	3.518	68.931	16.084	1.509	33.888	167.785
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	1.840	0.137	0.912	0.010	0.033	0.345	5.972	1.144	0.026	0.605	11.024
1990	2.477	0.155	0.925	0.010	0.033	0.318	5.960	1.183	0.058	1.131	12.249
2000	2.048	0.157	0.811	0.009	0.029	0.257	5.314	1.071	0.092	2.196	11.985
2001	2.046	0.175	0.795	0.009	0.029	0.251	5.175	1.054	0.091	2.165	11.790
2003	2.248	0.159	0.845	0.010	0.031	0.264	5.378	1.150	0.102	2.383	12.569
2008	2.215	0.161	0.835	0.010	0.031	0.261	5.185	1.167	0.106	2.440	12.412
2013	2.145	0.158	0.809	0.010	0.030	0.253	4.956	1.157	0.109	2.437	12.065

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
BGP Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Refrigerated Warehouses											
GWh by End Use											
1980	0.007	0.000	0.004	0.000	0.000	0.424	0.120	0.007	0.000	0.059	0.623
1990	0.013	0.000	0.006	0.001	0.000	0.612	0.193	0.013	0.001	0.136	0.976
2000	0.018	0.000	0.010	0.001	0.000	0.896	0.320	0.023	0.003	0.527	1.799
2001	0.020	0.000	0.011	0.001	0.000	0.984	0.350	0.026	0.003	0.589	1.984
2003	0.022	0.000	0.012	0.001	0.000	1.018	0.361	0.027	0.003	0.617	2.061
2008	0.023	0.000	0.012	0.001	0.000	1.061	0.375	0.029	0.003	0.654	2.158
2013	0.022	0.000	0.012	0.001	0.000	1.052	0.371	0.028	0.003	0.651	2.141
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.147	0.001	0.071	0.006	0.000	8.417	2.390	0.147	0.008	1.176	12.361
1990	0.154	0.001	0.068	0.007	0.000	7.018	2.217	0.150	0.011	1.564	11.189
2000	0.112	0.000	0.062	0.007	0.000	5.533	1.975	0.143	0.017	3.255	11.105
2001	0.112	0.000	0.061	0.007	0.000	5.454	1.939	0.143	0.017	3.263	10.996
2003	0.119	0.000	0.062	0.007	0.000	5.483	1.947	0.145	0.017	3.324	11.106
2008	0.118	0.000	0.063	0.008	0.000	5.514	1.946	0.148	0.017	3.396	11.211
2013	0.116	0.000	0.063	0.008	0.000	5.466	1.925	0.147	0.017	3.382	11.124
Schools											
GWh by End Use											
1980	5.932	1.439	6.012	0.093	0.119	0.338	6.652	2.326	0.053	0.692	23.656
1990	6.754	1.405	6.246	0.090	0.130	0.346	6.966	2.455	0.182	1.166	25.740
2000	7.430	2.930	8.003	0.223	0.193	0.416	8.943	3.245	0.392	3.334	35.109
2001	7.612	3.377	8.077	0.235	0.197	0.418	9.029	3.287	0.399	3.385	36.015
2003	8.326	3.048	8.372	0.261	0.209	0.429	9.367	3.432	0.420	3.546	37.412
2008	8.535	3.233	8.588	0.298	0.222	0.435	9.622	3.558	0.442	3.694	38.627
2013	8.715	3.406	8.734	0.338	0.235	0.436	9.824	3.662	0.464	3.825	39.640
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	2.793	0.677	2.830	0.044	0.056	0.159	3.131	1.095	0.025	0.326	11.136
1990	2.847	0.592	2.633	0.038	0.055	0.146	2.936	1.035	0.077	0.491	10.849
2000	2.554	1.007	2.751	0.077	0.066	0.143	3.074	1.115	0.135	1.146	12.068
2001	2.561	1.136	2.717	0.079	0.066	0.140	3.037	1.106	0.134	1.138	12.115
2003	2.697	0.987	2.712	0.085	0.068	0.139	3.034	1.112	0.136	1.148	12.117
2008	2.667	1.010	2.684	0.093	0.070	0.136	3.007	1.112	0.138	1.154	12.071
2013	2.630	1.028	2.636	0.102	0.071	0.132	2.965	1.105	0.140	1.154	11.963
Small Offices											
GWh by End Use											
1980	8.910	0.622	1.667	0.042	0.202	0.582	16.037	3.534	0.356	6.086	38.036
1990	16.187	1.226	2.066	0.153	0.201	0.541	20.483	4.665	1.694	14.637	61.853
2000	16.702	1.486	1.999	0.201	0.175	0.424	20.479	4.731	2.975	31.750	80.922
2001	16.826	1.694	1.972	0.205	0.170	0.410	20.165	4.700	2.957	31.583	80.683
2003	18.246	1.613	2.029	0.235	0.168	0.403	20.713	4.952	3.130	33.422	84.911
2008	18.526	1.879	2.046	0.286	0.155	0.370	20.926	5.213	3.344	35.470	88.216
2013	18.052	2.000	1.961	0.313	0.136	0.328	20.276	5.166	3.395	35.372	87.001
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	2.912	0.203	0.545	0.014	0.066	0.190	5.242	1.155	0.116	1.989	12.433
1990	3.890	0.295	0.496	0.037	0.048	0.130	4.922	1.121	0.407	3.517	14.863
2000	3.835	0.341	0.459	0.046	0.040	0.097	4.702	1.086	0.683	7.290	18.580
2001	3.863	0.389	0.453	0.047	0.039	0.094	4.630	1.079	0.679	7.252	18.525
2003	4.077	0.360	0.454	0.052	0.038	0.090	4.629	1.107	0.699	7.469	18.975
2008	3.992	0.405	0.441	0.062	0.033	0.080	4.509	1.123	0.721	7.643	19.007
2013	3.890	0.431	0.423	0.067	0.029	0.071	4.369	1.113	0.732	7.621	18.745
Warehouses											
GWh by End Use											
1980	2.391	0.152	0.282	0.013	0.001	0.000	12.718	0.753	0.079	3.500	19.890
1990	5.531	0.294	0.621	0.040	0.002	0.000	20.785	1.254	0.185	7.593	36.305
2000	5.766	0.373	0.733	0.051	0.002	0.000	23.147	1.362	0.328	17.651	49.413
2001	6.043	0.438	0.764	0.053	0.002	0.000	23.735	1.403	0.337	18.221	50.996
2003	6.706	0.399	0.817	0.057	0.002	0.000	24.740	1.475	0.351	19.212	53.759
2008	7.319	0.450	0.924	0.066	0.002	0.000	26.702	1.612	0.381	21.118	58.574
2013	7.756	0.484	1.001	0.073	0.002	0.000	28.097	1.696	0.404	22.333	61.846
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.589	0.037	0.069	0.003	0.000	0.000	3.134	0.186	0.019	0.863	4.901
1990	0.836	0.044	0.094	0.006	0.000	0.000	3.144	0.190	0.028	1.148	5.491
2000	0.768	0.050	0.098	0.007	0.000	0.000	3.085	0.181	0.044	2.352	6.585
2001	0.780	0.057	0.099	0.007	0.000	0.000	3.065	0.181	0.044	2.353	6.585
2003	0.838	0.050	0.102	0.007	0.000	0.000	3.092	0.184	0.044	2.401	6.719
2008	0.853	0.052	0.108	0.008	0.000	0.000	3.114	0.188	0.044	2.462	6.830
2013	0.855	0.053	0.110	0.008	0.000	0.000	3.096	0.187	0.044	2.461	6.816

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
OTHER Planning Area

Year	Cooling	Heating	Ventilati on	Water Heating	Cooking	Refrigerati on	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Colleges											
GWh by End Use											
1980	6.653	29.477	17.555	0.971	2.051	1.812	8.779	0.678	0.020	0.042	68.038
1990	5.583	24.137	15.442	1.249	1.884	1.657	8.112	0.634	0.021	0.043	58.764
2000	9.824	35.354	33.834	4.469	3.877	3.422	16.350	1.314	0.044	0.089	108.577
2001	9.778	32.318	33.434	4.408	3.824	3.376	16.129	1.298	0.044	0.088	104.697
2003	10.131	33.329	34.944	4.603	3.975	3.510	16.771	1.352	0.046	0.091	108.752
2008	11.474	36.699	40.286	5.664	4.544	4.014	19.139	1.546	0.052	0.105	123.524
2013	12.014	38.212	43.453	6.380	4.877	4.309	20.493	1.659	0.056	0.112	131.566
Average Consumption per Square Foot by End Use (kWh/SF)											
1980	9.242	40.946	24.386	1.349	2.849	2.517	12.194	0.941	0.028	0.058	94.511
1990	6.485	28.037	17.937	1.451	2.189	1.925	9.423	0.737	0.024	0.050	68.259
2000	6.531	23.505	22.495	2.971	2.577	2.275	10.871	0.874	0.029	0.059	72.187
2001	6.484	21.430	22.170	2.923	2.536	2.238	10.695	0.861	0.029	0.058	69.423
2003	6.565	21.596	22.642	2.983	2.576	2.274	10.867	0.876	0.030	0.059	70.467
2008	6.994	22.368	24.554	3.452	2.770	2.447	11.665	0.943	0.032	0.064	75.287
2013	6.889	21.911	24.916	3.658	2.796	2.471	11.751	0.951	0.032	0.064	75.439
Food Stores											
GWh by End Use											
1980	1.085	6.021	4.408	0.339	1.583	52.111	23.025	2.071	0.018	10.036	100.697
1990	1.549	8.153	6.480	0.669	2.168	71.279	31.752	2.878	0.031	15.252	140.211
2000	1.702	10.059	7.746	0.879	2.523	82.999	33.986	3.365	0.037	17.831	161.126
2001	1.707	9.496	7.885	0.918	2.566	84.423	33.813	3.430	0.038	18.177	162.453
2003	1.703	9.821	8.114	0.971	2.632	86.597	33.996	3.530	0.040	18.705	166.107
2008	1.787	10.965	9.110	1.155	2.939	96.747	36.428	3.945	0.046	20.904	184.027
2013	1.804	11.625	9.671	1.286	3.115	102.580	37.059	4.176	0.050	22.129	193.495
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	1.340	7.436	5.444	0.418	1.955	64.359	28.436	2.558	0.022	12.395	124.363
1990	1.259	6.627	5.267	0.544	1.762	57.941	25.811	2.340	0.025	12.398	113.974
2000	1.252	7.400	5.699	0.647	1.856	61.065	25.004	2.476	0.027	13.119	118.545
2001	1.202	6.686	5.552	0.646	1.806	59.441	23.807	2.415	0.027	12.798	114.379
2003	1.165	6.716	5.549	0.664	1.800	59.224	23.250	2.414	0.027	12.792	113.601
2008	1.154	7.078	5.881	0.746	1.897	62.454	23.516	2.547	0.030	13.495	118.796
2013	1.110	7.155	5.952	0.792	1.917	63.134	22.808	2.570	0.031	13.619	119.089
Hospitals											
GWh by End Use											
1980	3.680	0.698	9.154	0.134	0.743	3.667	13.274	0.492	0.011	0.013	31.867
1990	4.077	0.598	10.006	0.133	0.813	3.999	14.558	0.547	0.014	0.016	34.762
2000	8.661	0.570	18.850	0.328	1.521	7.500	27.056	1.032	0.029	0.031	65.579
2001	8.739	0.511	18.785	0.329	1.515	7.469	26.943	1.029	0.029	0.031	65.379
2003	9.235	0.494	19.744	0.350	1.590	7.839	28.277	1.082	0.031	0.032	68.673
2008	10.692	0.448	22.632	0.409	1.820	8.978	32.343	1.240	0.036	0.037	78.634
2013	11.570	0.368	24.221	0.444	1.951	9.631	34.658	1.328	0.039	0.039	84.249
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	7.910	1.501	19.677	0.288	1.598	7.883	28.535	1.057	0.024	0.029	68.501
1990	6.991	1.026	17.160	0.228	1.394	6.859	24.967	0.938	0.025	0.028	59.615
2000	8.414	0.554	18.312	0.319	1.478	7.286	26.283	1.002	0.028	0.030	63.706
2001	8.368	0.489	17.988	0.315	1.451	7.153	25.800	0.985	0.028	0.029	62.606
2003	8.515	0.456	18.204	0.322	1.466	7.227	26.071	0.998	0.029	0.030	63.317
2008	9.169	0.384	19.408	0.350	1.561	7.700	27.736	1.063	0.031	0.032	67.434
2013	9.344	0.297	19.560	0.358	1.576	7.777	27.988	1.073	0.031	0.032	68.036
Hotel/Motel											
GWh by End Use											
1980	16.635	15.385	42.071	1.110	11.058	6.255	34.297	5.111	0.087	0.152	132.161
1990	15.235	23.751	41.292	1.392	10.650	6.009	33.350	5.007	0.096	0.163	136.945
2000	13.512	39.931	39.679	1.841	10.101	5.707	31.560	4.801	0.097	0.156	147.383
2001	13.205	37.455	38.725	1.834	9.840	5.561	30.755	4.684	0.095	0.152	142.306
2003	12.848	48.429	39.036	2.201	9.890	5.591	30.888	4.725	0.099	0.154	153.860
2008	12.705	99.978	43.338	4.035	10.979	6.212	33.935	5.254	0.123	0.171	216.730
2013	12.086	155.516	46.161	5.990	11.737	6.644	35.855	5.607	0.146	0.182	279.924
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	3.340	3.090	8.448	0.223	2.221	1.256	6.887	1.026	0.017	0.031	26.539
1990	3.034	4.730	8.223	0.277	2.121	1.197	6.641	0.997	0.019	0.032	27.271
2000	2.793	8.253	8.201	0.380	2.088	1.180	6.523	0.992	0.020	0.032	30.462
2001	2.764	7.841	8.107	0.384	2.060	1.164	6.438	0.980	0.020	0.032	29.791
2003	2.676	10.087	8.130	0.458	2.060	1.164	6.433	0.984	0.021	0.032	32.045
2008	2.453	19.305	8.368	0.779	2.120	1.199	6.552	1.014	0.024	0.033	41.848
2013	2.197	28.267	8.391	1.089	2.133	1.208	6.517	1.019	0.027	0.033	50.881

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
OTHER Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Large Offices											
GWh by End Use											
1980	3.144	0.090	12.008	0.083	0.248	0.149	18.584	2.299	0.245	4.000	40.850
1990	5.126	0.617	18.331	0.125	0.393	0.212	27.984	3.682	0.507	7.007	63.986
2000	6.492	1.232	22.344	0.167	0.513	0.256	35.242	4.813	0.727	9.159	80.946
2001	7.135	1.430	24.117	0.190	0.577	0.284	39.073	5.425	0.848	10.323	89.402
2003	7.078	1.479	23.949	0.191	0.576	0.282	39.050	5.425	0.861	10.324	89.214
2008	7.775	1.825	26.198	0.219	0.648	0.315	43.640	6.103	1.010	11.614	99.348
2013	8.164	2.127	27.255	0.239	0.695	0.337	46.231	6.534	1.116	12.434	105.134
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	5.698	0.164	21.761	0.150	0.449	0.270	33.679	4.166	0.444	7.249	74.030
1990	5.839	0.702	20.881	0.142	0.448	0.242	31.876	4.195	0.578	7.982	72.886
2000	5.719	1.085	19.682	0.147	0.452	0.225	31.042	4.240	0.640	8.067	71.299
2001	5.488	1.100	18.550	0.146	0.444	0.219	30.054	4.173	0.652	7.940	68.765
2003	5.417	1.132	18.328	0.146	0.441	0.216	29.884	4.152	0.659	7.901	68.274
2008	5.516	1.295	18.587	0.155	0.460	0.224	30.962	4.330	0.717	8.240	70.484
2013	5.453	1.420	18.203	0.160	0.464	0.225	30.876	4.364	0.745	8.304	70.215
Miscellaneous											
GWh by End Use											
1980	61.751	14.549	99.940	2.374	0.546	2.119	125.988	33.873	1.505	22.742	365.388
1990	58.442	14.758	108.175	2.082	0.568	1.997	137.196	35.829	2.198	26.310	387.555
2001	52.745	15.821	109.554	1.982	0.559	1.769	130.405	35.613	2.315	26.151	376.914
2003	51.643	17.158	113.200	2.046	0.573	1.794	133.188	36.627	2.461	26.896	385.587
2008	50.139	20.287	123.504	2.239	0.616	1.906	141.821	39.419	2.850	28.946	411.725
2013	47.111	22.515	128.528	2.340	0.634	1.956	144.963	40.524	3.116	29.757	421.444
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	6.892	1.624	11.154	0.265	0.061	0.236	14.061	3.780	0.168	2.538	40.779
1990	5.482	1.384	10.148	0.195	0.053	0.187	12.870	3.361	0.206	2.468	36.356
2000	5.210	1.658	10.778	0.195	0.055	0.176	12.881	3.509	0.226	2.577	37.266
2001	5.131	1.539	10.658	0.193	0.054	0.172	12.686	3.465	0.225	2.544	36.667
2003	4.921	1.635	10.786	0.195	0.055	0.171	12.691	3.490	0.235	2.563	36.740
2008	4.618	1.869	11.376	0.206	0.057	0.176	13.063	3.631	0.263	2.666	37.925
2013	4.244	2.028	11.580	0.211	0.057	0.176	13.060	3.651	0.281	2.681	37.970
Restaurants											
GWh by End Use											
1980	4.245	4.945	19.701	0.473	11.383	24.271	20.945	5.173	0.026	15.044	106.206
1990	4.495	4.271	19.521	0.434	10.953	23.296	20.491	5.054	0.030	16.077	104.622
2000	4.507	4.510	20.760	0.438	11.350	24.167	20.377	5.289	0.031	16.824	108.253
2001	4.459	4.159	20.739	0.428	11.275	24.011	20.148	5.264	0.032	16.745	107.259
2003	4.359	4.181	20.938	0.419	11.280	24.027	20.047	5.285	0.033	16.810	107.381
2008	4.458	4.580	23.880	0.417	12.534	26.713	21.503	5.881	0.040	18.705	118.711
2013	4.413	4.852	26.120	0.396	13.413	28.589	22.070	6.283	0.046	19.985	126.169
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	7.057	8.221	32.752	0.786	18.925	40.351	34.822	8.600	0.043	25.012	176.568
1990	7.191	6.833	31.229	0.694	17.521	37.268	32.780	8.086	0.047	25.719	167.368
2000	7.226	7.231	33.285	0.702	18.198	38.747	32.671	8.481	0.050	26.975	173.566
2001	7.063	6.588	32.851	0.678	17.860	38.034	31.915	8.339	0.050	26.524	169.902
2003	6.870	6.589	32.999	0.661	17.778	37.868	31.596	8.329	0.052	26.494	169.237
2008	6.513	6.690	34.886	0.610	18.312	39.026	31.415	8.591	0.059	27.326	173.427
2013	6.070	6.673	35.924	0.545	18.447	39.320	30.354	8.641	0.064	27.486	173.524
Retail											
GWh by End Use											
1980	5.545	2.449	8.337	0.127	0.145	2.252	35.468	1.182	0.112	4.648	60.265
1990	7.189	2.681	11.116	0.199	0.197	2.883	49.068	1.644	0.200	7.072	82.250
2000	7.705	3.062	12.502	0.261	0.228	3.044	53.031	1.916	0.236	8.240	90.226
2001	7.699	2.865	12.586	0.275	0.232	3.072	53.203	1.957	0.244	8.416	90.549
2003	7.639	2.910	12.782	0.291	0.238	3.114	53.865	2.015	0.255	8.667	91.777
2008	7.941	3.101	13.887	0.346	0.264	3.416	58.193	2.244	0.295	9.650	99.336
2013	7.950	3.176	14.360	0.385	0.279	3.602	59.792	2.372	0.318	10.202	102.438
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	3.600	1.589	5.412	0.083	0.094	1.462	23.022	0.767	0.073	3.017	39.118
1990	3.081	1.149	4.763	0.085	0.085	1.235	21.026	0.705	0.086	3.030	35.244
2000	2.992	1.189	4.856	0.101	0.089	1.182	20.597	0.744	0.091	3.201	35.043
2001	2.862	1.065	4.679	0.102	0.086	1.142	19.780	0.728	0.091	3.129	33.664
2003	2.757	1.050	4.613	0.105	0.086	1.124	19.440	0.727	0.092	3.128	33.122
2008	2.703	1.055	4.726	0.118	0.090	1.162	19.804	0.764	0.100	3.284	33.806
2013	2.581	1.031	4.662	0.125	0.091	1.170	19.412	0.770	0.103	3.312	33.258

Table I-1
Commercial Building Forecast
Electricity Sales by End-Use and Building Type (GWh)
OTHER Planning Area

Year	Cooling	Heating	Ventilation	Water Heating	Cooking	Refrigeration	Indoor Lighting	Outdoor Lighting	Office Equipment	Misc.	Total
Refrigerated Warehouses											
GWh by End Use											
1980	0.001	0.002	0.024	0.001	0.000	7.839	0.605	0.133	0.004	0.781	9.393
1990	0.001	0.003	0.034	0.002	0.000	9.063	0.821	0.186	0.008	1.191	11.307
2000	0.001	0.003	0.034	0.002	0.000	7.805	0.846	0.188	0.009	1.202	10.090
2001	0.001	0.003	0.035	0.002	0.000	7.848	0.855	0.191	0.009	1.225	10.168
2003	0.001	0.003	0.036	0.002	0.000	8.132	0.890	0.202	0.009	1.295	10.571
2008	0.001	0.003	0.041	0.002	0.000	8.916	0.975	0.226	0.011	1.450	11.624
2013	0.001	0.003	0.043	0.002	0.000	9.300	1.015	0.237	0.011	1.519	12.131
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	0.010	0.030	0.309	0.019	0.000	98.858	7.630	1.681	0.055	9.854	118.446
1990	0.008	0.026	0.295	0.017	0.000	79.219	7.175	1.624	0.066	10.409	98.839
2000	0.006	0.024	0.270	0.014	0.000	61.944	6.715	1.488	0.070	9.543	80.076
2001	0.006	0.022	0.268	0.014	0.000	60.979	6.642	1.484	0.070	9.516	79.002
2003	0.006	0.023	0.274	0.014	0.000	61.145	6.695	1.519	0.071	9.738	79.484
2008	0.006	0.023	0.290	0.013	0.000	63.593	6.953	1.613	0.075	10.344	82.911
2013	0.005	0.023	0.291	0.012	0.000	63.698	6.955	1.623	0.077	10.403	83.087
Schools											
GWh by End Use											
1980	3.722	4.300	15.349	2.941	1.116	1.117	18.329	6.630	0.048	0.065	53.615
1990	4.276	3.865	18.200	2.594	1.148	1.146	18.963	6.946	0.057	0.075	57.270
2000	6.557	4.017	26.911	3.220	1.338	1.339	21.788	8.176	0.072	0.088	73.505
2001	6.751	3.672	27.567	3.266	1.341	1.342	21.795	8.204	0.072	0.088	74.099
2003	7.001	3.675	28.685	3.361	1.357	1.358	22.028	8.324	0.074	0.089	75.953
2008	7.934	3.656	32.701	3.740	1.444	1.446	23.298	8.871	0.081	0.095	83.267
2013	8.488	3.451	35.580	3.974	1.472	1.474	23.557	9.032	0.085	0.097	87.209
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	1.723	1.990	7.105	1.361	0.517	0.517	8.485	3.069	0.022	0.030	24.820
1990	1.741	1.574	7.411	1.056	0.467	0.467	7.722	2.828	0.023	0.030	23.320
2000	2.332	1.429	9.571	1.145	0.476	0.476	7.749	2.908	0.026	0.031	26.143
2001	2.366	1.287	9.662	1.145	0.470	0.470	7.639	2.876	0.025	0.031	25.971
2003	2.437	1.279	9.984	1.170	0.472	0.473	7.667	2.897	0.026	0.031	26.437
2008	2.712	1.250	11.179	1.279	0.494	0.494	7.965	3.033	0.028	0.033	28.466
2013	2.868	1.166	12.022	1.343	0.497	0.498	7.960	3.052	0.029	0.033	29.468
Small Offices											
GWh by End Use											
1980	12.240	4.326	11.819	1.281	0.370	2.111	61.419	15.505	1.613	15.219	125.904
1990	13.015	4.687	12.059	1.092	0.368	1.961	59.088	15.670	1.797	16.822	126.559
2000	12.077	5.856	10.866	0.941	0.330	1.585	51.257	14.168	1.800	15.209	114.089
2001	11.661	5.377	10.369	0.901	0.315	1.502	48.802	13.542	1.749	14.537	108.754
2003	11.648	6.075	10.300	0.905	0.315	1.482	48.022	13.593	1.852	14.593	108.786
2008	13.252	8.814	11.374	1.031	0.355	1.648	51.402	15.297	2.363	16.422	121.959
2013	14.376	11.054	11.991	1.114	0.380	1.766	52.702	16.382	2.739	17.586	130.091
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	2.957	1.045	2.855	0.309	0.089	0.510	14.837	3.746	0.390	3.676	30.415
1990	3.146	1.133	2.915	0.264	0.089	0.474	14.284	3.788	0.434	4.067	30.596
2000	3.257	1.580	2.931	0.254	0.089	0.428	13.826	3.821	0.485	4.102	30.773
2001	3.206	1.478	2.851	0.248	0.087	0.413	13.417	3.723	0.481	3.997	29.900
2003	3.186	1.662	2.817	0.248	0.086	0.405	13.136	3.718	0.507	3.992	29.757
2008	3.360	2.235	2.884	0.262	0.090	0.418	13.035	3.879	0.599	4.164	30.927
2013	3.432	2.639	2.863	0.266	0.091	0.422	12.581	3.911	0.654	4.198	31.055
Warehouses											
GWh by End Use											
1980	0.718	0.383	0.671	0.028	0.001	0.000	5.249	0.733	0.035	5.495	13.313
1990	1.733	0.671	1.286	0.050	0.001	0.000	10.080	1.433	0.089	11.746	27.090
2000	1.800	0.807	1.341	0.047	0.001	0.000	11.119	1.530	0.109	12.538	29.291
2001	1.841	0.785	1.384	0.047	0.001	0.000	11.463	1.588	0.112	13.018	30.240
2003	1.897	0.852	1.464	0.048	0.001	0.000	12.051	1.692	0.118	13.864	31.987
2008	2.040	0.991	1.654	0.052	0.001	0.000	13.541	1.934	0.134	15.849	36.196
2013	2.071	1.069	1.746	0.052	0.001	0.000	14.437	2.062	0.144	16.902	38.484
Average Consumption per Square Foot by End-Use (kWh/SF)											
1980	1.125	0.600	1.051	0.043	0.001	0.000	8.223	1.149	0.055	8.608	20.854
1990	1.339	0.518	0.994	0.039	0.001	0.000	7.786	1.107	0.069	9.073	20.925
2000	1.194	0.535	0.889	0.031	0.001	0.000	7.374	1.015	0.072	8.315	19.425
2001	1.174	0.501	0.882	0.030	0.001	0.000	7.311	1.013	0.072	8.303	19.287
2003	1.163	0.522	0.897	0.030	0.001	0.000	7.385	1.037	0.073	8.497	19.603
2008	1.162	0.565	0.943	0.029	0.001	0.000	7.715	1.102	0.076	9.030	20.623
2013	1.112	0.574	0.938	0.028	0.001	0.000	7.754	1.108	0.077	9.078	20.670

TABLE J-1
Nonresidential Electricity Consumption Forecast by SIC and Planning Area (GWh)
(Excluding Commercial)

Sector	SIC	Year	BGP	DWR	LADWP	OTHER	PGE	SCE	SDGE	SMUD	Total
Agriculture & Water Pumping	01	1980			0.91	121.44	3167.91	645.27	56.08	33.57	4025.18
		1990	0.44		0.65	144.57	3098.49	803.82	63.20	15.73	4126.90
		2000	6.66		0.35	185.97	2355.05	820.24	78.61	17.21	3464.09
		2001	7.35		0.30	178.24	2274.69	738.01	75.96	19.57	3294.12
		2003	7.35		0.30	186.56	2118.22	763.17	82.00	18.80	3176.40
		2008	7.35		0.30	205.23	2421.34	850.81	95.21	18.80	3599.04
		2013	7.35		0.30	222.85	2375.08	901.38	104.04	18.80	3629.79
	02	1980	0.37			41.29	607.57	239.28	23.02	33.68	945.20
		1990	0.15			41.25	727.17	328.63	13.20	33.68	1144.08
		2000	0.11			40.61	712.67	377.84	12.36	33.68	1177.27
		2001	0.11			40.74	740.04	349.60	11.11	33.68	1175.28
		2003	0.11			41.04	772.14	366.11	11.54	33.68	1224.62
		2008	0.11			41.28	752.68	420.64	12.23	33.68	1260.63
		2013	0.11			41.29	746.62	458.45	12.30	33.68	1292.45
	494	1980	9.63		127.36	15.43	938.95	2758.03	116.83	34.89	4001.12
		1990	35.30		148.72	42.78	1120.51	3745.48	148.10	62.25	5303.14
		2000	21.57		183.18	62.18	1228.76	4055.37	158.77	79.87	5789.70
		2001	21.74	6349.16	178.69	66.27	1279.36	4160.84	160.89	82.14	12299.08
		2003	21.74	7889.31	182.33	69.67	1324.91	4360.78	178.94	86.82	14114.50
		2008	21.74	7889.31	188.52	86.65	1459.48	4893.12	205.15	97.91	14841.88
		2013	21.74	7889.31	196.90	103.02	1549.62	5462.73	218.27	108.67	15550.26
	497	1980	0.05		0.14	113.07	2081.15	171.47	2.20	8.79	2376.87
		1990	0.03		0.22	161.08	2116.17	112.28	2.07	13.61	2405.46
		2000	0.00		0.00	103.73	1993.53	91.87	1.73	22.79	2213.65
		2001	0.00		0.00	110.86	2017.46	83.00	1.76	21.05	2234.13
		2003	0.00		0.00	111.38	2072.68	81.87	1.82	22.50	2290.26
		2008	0.00		0.00	112.04	2156.60	79.05	1.93	26.14	2375.76
		2013	0.00		0.00	112.06	2181.04	75.80	1.94	29.78	2400.63
Industrial	2030	1980	0.05		21.26	2.87	592.37	198.52	0.60	57.93	873.58
		1990	0.65		30.98	3.21	926.92	308.10	0.60	55.79	1326.25
		2000	0.05		30.93	5.04	926.23	250.61	14.43	49.51	1276.80
		2001			36.50	2.05	968.48	270.17	14.17	5.26	1296.63
		2003			39.67	2.03	990.39	282.23	13.49	4.99	1332.80
		2008			46.12	1.80	1061.54	316.82	11.93	4.24	1442.44
		2013			51.33	1.60	1093.57	341.18	10.80	3.60	1502.08
	2060	1980			7.53	1.51	241.45	8.49	0.05	1.44	260.47
		1990			3.28	1.89	292.91	11.13	0.06	19.98	329.24
		2000			2.00	1.62	353.26	21.49	0.26	1.92	380.55
		2001			0.87	2.16	358.56	22.08	0.36	2.03	386.07
		2003			0.92	2.33	366.88	23.53	0.37	1.84	395.88
		2008			0.97	2.65	379.82	25.85	0.41	1.38	411.08
		2013			1.00	2.84	384.04	27.63	0.52	1.09	417.11
	20X	1980	14.14		359.73	15.07	1422.25	688.41	66.27	31.59	2597.46
		1990	22.65		366.98	7.67	1784.48	999.65	28.37	63.70	3273.51
		2000	15.37		357.14	11.38	2216.58	1345.44	41.96	67.62	4055.48
		2001	13.99		390.99	8.26	2573.80	1393.57	44.11	71.13	4495.85
		2003	14.41		401.98	8.52	2532.85	1403.72	46.15	73.73	4481.36
		2008	15.87		419.55	10.30	2899.15	1629.30	53.15	83.67	5110.99
		2013	17.13		435.47	11.87	3143.06	1790.54	59.37	91.67	5549.11
	22	1980	1.17		23.44	0.98	45.08	152.39	0.64	0.49	224.19
		1990	1.73		40.68	0.53	52.38	207.94	1.04	0.25	304.54
		2000	0.79		52.77	0.37	60.72	383.75	3.44	0.43	502.27
		2001	0.89		49.92	0.35	65.01	361.05	3.33	0.49	481.05
		2003	0.81		45.91	0.37	56.72	325.32	2.75	0.46	432.35
		2008	0.88		50.64	0.36	56.20	362.65	2.77	0.52	474.02
		2013	0.98		56.80	0.33	57.67	406.05	2.91	0.59	525.32
	23	1980	1.82		99.69	0.01	28.20	56.22	3.52	0.25	189.70
		1990	2.12		110.70	0.33	41.54	134.83	5.57	0.61	295.70
		2000	2.11		131.81	0.13	37.81	258.88	15.81	0.68	447.23
		2001	2.09		141.67	0.14	41.58	265.14	15.02	0.63	466.27
		2003	2.12		146.66	0.13	39.52	268.99	14.54	0.60	472.55
		2008	1.91		132.06	0.11	31.25	242.24	12.38	0.50	420.44
		2013	1.71		118.97	0.10	25.27	215.83	10.87	0.43	373.17
	24	1980	3.35		23.11	125.05	821.99	114.31	2.59	10.22	1100.62
		1990	3.12		21.50	89.81	1347.92	137.05	7.97	21.90	1629.28
		2000	1.68		25.10	59.09	1220.72	167.52	11.63	26.11	1511.86
		2001	1.83		27.70	59.74	1242.17	133.40	10.02	26.08	1500.94
		2003	1.66		25.22	49.97	1080.77	119.47	8.39	21.07	1306.55
		2008	1.79		27.19	47.47	1073.14	126.06	7.69	18.65	1301.99
		2013	1.82		27.64	43.59	1007.80	125.64	6.86	16.13	1229.50
	25	1980	3.16		43.39	0.15	31.44	169.51	6.22	0.97	254.83
		1990	0.95		41.65	0.12	34.81	252.02	5.20	2.66	337.41
		2000	0.59		35.38	1.14	39.56	270.80	13.84	6.02	367.33
		2001	0.65		38.26	1.31	39.77	256.92	16.73	5.65	359.29
		2003	0.63		37.80	1.25	38.27	249.47	16.20	5.23	348.85
		2008	0.68		39.73	1.35	39.85	261.71	18.15	5.26	366.71
		2013	0.72		41.36	1.40	40.86	273.02	20.18	5.28	382.82

TABLE J-1
Nonresidential Electricity Consumption Forecast by SIC and Planning Area (GWh)
(Excluding Commercial)

Sector	SIC	Year	BGP	DWR	LADWP	OTHER	PGE	SCE	SDGE	SMUD	Total
Industrial	26X	1980	1.51		19.86	0.01	279.29	381.54	2.36	1.02	685.60
		1990	2.94		19.03	1.13	264.92	595.44	4.04	92.33	979.84
		2000	1.28		30.52	3.34	343.83	967.44	11.48	14.18	1372.08
		2001	1.27		35.42	2.83	361.70	936.90	10.70	14.32	1363.13
		2003	1.21		33.33	2.77	329.15	888.14	10.09	12.95	1277.65
		2008	1.46		38.35	3.22	378.79	1059.32	12.49	14.67	1508.30
		2013	1.62		40.98	3.19	399.09	1156.66	14.23	15.46	1631.22
	2610	1980			1.87		0.69	11.34			13.90
		1990			1.00		190.72	17.79		0.01	209.53
		2000			0.03		167.71	0.00			167.74
		2001					127.94	0.00			127.94
		2003					115.40	0.00			115.41
		2008					105.61	0.00			105.61
		2013					79.83	0.00			79.83
	262-3	1980	0.01		2.48		479.53	441.08	0.00	64.00	987.10
		1990	0.03		1.63	0.04	527.68	622.11	0.00	0.05	1151.54
		2000	0.11		1.31	2.65	527.32	441.59	0.56	42.51	1016.05
		2001	0.12		1.36	3.25	580.14	472.73		51.89	1109.48
		2003	0.11		1.27	3.04	552.49	448.79		63.85	1069.55
		2008	0.11		1.30	3.52	625.58	506.31		79.11	1215.93
		2013	0.11		1.24	3.65	627.46	510.31		86.71	1229.47
	27	1980	13.57		169.06	1.35	228.36	260.08	35.33	16.51	724.25
		1990	21.18		228.80	1.62	368.12	467.42	101.25	43.92	1232.32
		2000	20.20		188.10	1.28	364.61	531.92	87.97	44.01	1238.10
		2001	21.00		259.99	1.28	395.92	537.64	85.45	42.45	1343.73
		2003	20.27		258.49	1.31	377.49	521.12	78.74	39.96	1297.38
		2008	20.03		262.12	1.61	361.65	518.64	78.16	36.95	1279.16
		2013	18.75		252.03	1.75	327.19	487.20	73.57	32.84	1193.33
	28	1980	22.01		324.30	59.75	1329.36	1938.30	50.72	28.01	3752.46
		1990	44.94		258.77	0.39	1167.30	1808.46	100.64	105.18	3485.67
		2000	29.82		314.38	0.57	1278.28	2098.52	170.05	191.11	4082.74
		2001	32.42		430.44	0.55	1357.34	2105.60	159.28	169.86	4255.49
		2003	33.90		450.13	0.56	1396.66	2193.97	160.86	163.78	4399.86
		2008	44.22		576.58	0.69	1840.65	2879.29	202.05	191.82	5735.29
		2013	48.03		618.11	0.72	1986.54	3115.86	216.76	199.01	6185.04
	29	1980	0.44		971.45	0.21	4261.47	2304.52	11.85	2.96	7552.91
		1990	0.35		1074.14	0.50	3734.90	2864.76	10.91	0.72	7686.26
		2000	0.18		920.27	0.27	3386.88	2248.80	3.20	7.65	6567.25
		2001	0.23		829.81	0.26	3718.48	1897.36	3.18	5.73	6455.06
		2003	0.23		846.45	0.26	3699.18	1876.43	3.13	5.85	6431.54
		2008	0.21		763.21	0.27	3227.58	1787.49	2.78	3.45	5785.00
		2013	0.16		578.10	0.26	2322.35	1396.07	2.38	1.96	4301.29
	308	1980	25.56		57.65	0.02	241.08	720.75	7.41	0.58	1053.04
		1990	10.49		79.87	0.05	476.46	1152.36	29.02	4.88	1753.12
		2000	7.67		73.37	0.91	675.55	1472.30	48.96	17.42	2296.17
		2001	6.73		84.63	0.82	735.06	1483.30	46.77	15.27	2372.57
		2003	6.25		76.58	0.78	684.35	1389.40	41.82	14.18	2213.35
		2008	5.94		66.88	0.82	663.87	1359.13	39.85	13.53	2150.02
		2013	4.86		51.74	0.73	552.35	1141.78	33.41	11.25	1796.12
	30X	1980	2.03		10.30	0.01	100.68	138.47	9.02		260.52
		1990	0.51		5.80		75.89	151.60	2.80	0.05	236.65
		2000	0.04		8.32	0.07	78.60	196.07	15.75	0.74	299.58
		2001	0.04		10.35	0.03	83.98	195.77	14.91	0.87	305.95
		2003	0.04		9.67	0.04	79.66	182.85	13.78	0.85	286.88
		2008	0.04		9.74	0.04	89.52	193.80	15.16	0.96	309.26
		2013	0.04		8.89	0.05	88.71	184.00	15.18	0.95	297.82
	31	1980	0.05		8.31	0.01	15.54	15.68	0.93	0.05	40.58
		1990	0.06		7.25	0.03	23.24	10.01	0.58	0.08	41.26
		2000	0.13		7.02	0.43	10.97	10.28	1.31	0.02	30.16
		2001	0.18		7.32	0.33	10.86	12.98	2.71	0.01	34.39
		2003	0.18		7.14	0.31	10.07	12.61	2.62	0.01	32.93
		2008	0.20		8.06	0.29	12.05	14.24	3.15	0.02	38.00
		2013	0.20		7.98	0.25	12.40	14.12	3.42	0.01	38.38
	3241	1980	0.00		1.36	0.02	336.98	912.83	0.03	0.01	1251.23
		1990			0.00		416.06	969.69		0.53	1386.28
		2000			0.00		449.52	1105.91		0.63	1556.06
		2001					510.97	1122.66			1633.63
		2003					518.87	1064.50			1583.38
		2008					554.28	985.59			1539.87
		2013					552.16	886.25			1438.41
	321-3	1980	0.32		4.24	0.06	457.68	397.62	4.98	0.10	865.01
		1990	0.25		3.97		667.00	389.40	1.05	0.13	1061.80
		2000	0.05		3.09	0.02	438.15	334.68	0.23	0.21	776.44
		2001			3.45		471.99	314.61	0.36		790.42
		2003			3.41		412.95	280.83	0.34		697.53
		2008			3.24		437.40	311.97	0.70		753.31
		2013			3.23		417.50	313.31	1.08		735.13
	32X	1980	1.23		40.27	31.17	650.68	418.47	34.83	4.92	1181.56
		1990	2.74		31.22	36.84	723.06	356.88	26.58	9.90	1187.23
		2000	1.90		30.59	46.10	635.28	372.37	24.33	32.74	1143.31
		2001	2.03		33.46	30.50	708.87	372.64	25.15	37.17	1209.84
		2003	2.02		33.47	28.03	639.89	352.32	23.38	33.75	1112.86
		2008	2.16		33.87	26.57	672.16	402.42	21.40	29.36	1187.95
		2013	2.24		33.87	24.45	654.49	426.22	19.82	25.27	1186.36

TABLE J-1
Nonresidential Electricity Consumption Forecast by SIC and Planning Area (GWh)
(Excluding Commercial)

Sector	SIC	Year	BGP	DWR	LADWP	OTHER	PGE	SCE	SDGE	SMUD	Total
Industrial	33	1980	2.37		212.58	0.01	817.43	1856.91	15.90	5.45	2910.66
		1990	3.98		180.47	0.02	722.54	1187.98	12.01	1.87	2108.87
		2000	3.25		56.80	0.01	856.70	1302.33	14.00	10.79	2243.89
		2001	2.66		46.89	0.01	913.61	1320.77	13.71	7.86	2305.50
		2003	2.67		46.65	0.01	880.94	1301.66	13.25	7.90	2253.08
		2008	3.00		50.10	0.01	990.42	1527.77	14.55	9.03	2594.87
		2013	3.28		53.20	0.01	1066.09	1720.25	15.93	10.01	2868.77
	34	1980	39.06		217.52	0.06	365.90	1082.81	16.48	3.60	1725.44
		1990	49.19		99.93	10.63	473.84	1133.77	35.00	5.67	1808.03
		2000	28.35		167.36	12.92	556.31	1201.03	80.07	9.01	2055.04
		2001	28.67		182.29	13.63	601.09	1247.75	78.57	10.35	2162.35
		2003	28.03		178.82	12.30	573.61	1210.79	76.40	9.14	2089.10
		2008	28.63		176.37	11.57	610.78	1292.05	82.08	7.53	2209.01
		2013	26.66		161.32	10.36	583.05	1243.27	81.12	6.09	2111.86
	357	1980	0.20		56.13		702.84	327.74	28.76	1.18	1116.84
		1990	0.14		45.73	0.51	1629.28	392.71	79.23	8.57	2156.17
		2000	0.23		19.25	0.36	1310.75	225.09	86.97	29.45	1672.10
		2001	0.20		23.63	0.25	1352.57	214.11	73.52	22.10	1686.38
		2003	0.12		14.45	0.16	758.25	131.42	42.03	13.99	960.42
		2008	0.12		12.40	0.17	596.68	119.83	43.87	14.02	787.08
		2013	0.15		13.63	0.22	593.17	138.07	60.43	17.48	823.16
	35X	1980	15.44		122.98	0.81	481.33	680.57	67.18	8.26	1376.55
		1990	16.66		90.95	1.56	412.85	582.71	76.70	12.92	1194.33
		2000	9.66		96.16	13.11	685.09	643.89	83.09	20.69	1551.70
		2001	11.14		103.78	14.53	631.38	618.71	82.34	21.36	1483.24
		2003	8.78		81.83	11.23	488.11	491.55	62.63	17.14	1161.26
		2008	9.73		84.96	12.05	556.39	543.20	68.88	20.43	1295.66
		2013	9.62		79.25	11.82	563.31	535.53	68.24	22.35	1290.11
	366	1980	12.86		72.15	0.06	313.09	687.37	30.73	0.90	1117.16
		1990	17.59		29.43	0.20	258.59	95.75	55.06	7.77	464.38
		2000	2.40		15.77	9.64	309.11	539.08	143.86	19.89	1039.76
		2001	2.67		19.72	13.84	325.59	537.58	141.25	22.46	1063.11
		2003	2.24		17.46	12.45	271.09	462.92	104.20	14.75	885.12
		2008	2.49		20.11	14.63	304.79	519.62	113.36	9.96	984.96
		2013	2.79		23.02	17.39	335.79	585.05	125.27	8.00	1097.31
	367	1980	39.41		82.93		1289.65	402.07	76.05	0.04	1890.15
		1990	14.53		153.84	0.02	2012.67	686.87	212.28	38.30	3118.53
		2000	5.83		79.15	0.32	2437.90	1005.01	199.89	89.98	3818.07
		2001	4.76		88.75	0.39	2573.21	978.88	198.18	92.65	3936.81
		2003	3.84		75.17	0.34	2010.92	820.07	132.43	74.87	3117.66
		2008	5.77		104.70	0.56	2798.16	1241.28	183.29	116.39	4450.16
		2013	8.86		153.19	0.92	4001.22	1908.95	269.10	184.90	6527.15
	36X	1980	13.23		104.41	0.18	328.12	395.22	63.08	4.52	908.76
		1990	26.15		102.56	0.15	278.47	570.47	95.20	20.14	1093.14
		2000	17.59		68.55	2.59	199.40	521.21	137.73	20.70	967.76
		2001	20.68		77.14	2.92	230.86	504.04	157.61	22.42	1015.66
		2003	17.10		66.15	2.48	193.49	428.21	125.31	19.52	852.27
		2008	18.70		69.94	2.89	244.60	468.68	137.01	22.92	964.74
		2013	18.45		67.41	2.82	271.52	461.77	136.54	23.80	982.32
	37	1980	273.57		452.74	0.32	575.06	1575.56	239.83	1.00	3118.08
		1990	202.91		480.41	2.59	719.99	2690.70	432.38	108.66	4637.65
		2000	11.18		152.74	1.84	364.63	1702.41	309.20	111.05	2653.06
		2001	9.61		168.15	2.06	442.29	1777.05	311.81	113.61	2824.59
		2003	6.05		104.07	1.50	312.04	1135.61	219.61	68.97	1847.85
		2008	7.47		127.02	1.85	368.37	1414.40	284.10	77.02	2280.22
		2013	8.88		150.77	2.18	411.75	1689.06	350.22	84.21	2697.06
	38	1980	29.23		71.88	0.00	263.84	274.27	37.71	0.63	677.55
		1990	32.52		62.88	0.01	767.87	1177.28	118.57	3.27	2162.41
		2000	18.85		64.43	0.34	940.86	691.39	132.64	7.67	1856.17
		2001	20.00		59.25	0.41	783.46	702.65	126.41	7.62	1699.80
		2003	19.27		57.70	0.41	788.85	688.00	118.52	7.65	1680.39
		2008	22.21		66.00	0.50	968.87	805.42	134.94	9.35	2007.29
		2013	23.49		70.04	0.57	1060.36	860.36	141.29	10.31	2166.42
	39	1980	68.43		42.31	0.05	89.85	258.58	6.90	0.71	466.82
		1990	9.51		27.53	0.10	52.32	282.73	31.06	1.64	404.90
		2000	7.69		38.88	1.43	69.84	267.33	78.65	2.03	465.83
		2001	6.72		43.02	9.44	63.68	270.25	116.02	2.05	511.17
		2003	6.24		39.98	8.71	58.87	254.77	109.50	1.94	480.00
		2008	6.35		39.40	8.89	62.10	263.90	120.38	2.06	503.07
		2013	5.69		34.67	8.29	57.91	238.57	114.41	2.03	461.57

TABLE J-1
Nonresidential Electricity Consumption Forecast by SIC and Planning Area (GWh)
(Excluding Commercial)

Sector	SIC	Year	BGP	DWR	LADWP	OTHER	PGE	SCE	SDGE	SMUD	Total
Mining	10	1980			0.00	0.04	10.14	292.07	0.03	0.02	302.29
		1990	0.01		0.09	18.27	255.58	121.77	0.17	0.01	395.90
		2000	0.01		0.09	31.11	102.75	26.89	0.01		160.87
		2001	0.01		0.09	19.33	106.23	29.25	0.01		154.91
		2003	0.01		0.09	15.09	104.72	29.89	0.01		149.81
		2008	0.01		0.11	15.91	112.87	35.03	0.01		163.94
		2013	0.01		0.11	16.27	115.98	37.45	0.01		169.83
	13	1980			196.28	0.02	1160.86	1923.05	0.06	0.09	3280.35
		1990	0.00		95.17	0.05	2593.17	1914.94	0.19	0.67	4604.19
		2000	9.30		106.50	0.03	2330.91	1694.10	0.16	1.58	4142.56
		2001	13.55		121.11	0.05	2330.68	1747.62	0.39	1.70	4215.11
		2003	13.03		116.46	0.05	2240.73	1680.46	0.37	1.64	4052.76
		2008	12.82		114.46	0.06	2235.58	1652.88	0.32	1.37	4017.48
		2013	12.54		111.91	0.06	2207.22	1618.02	0.29	1.17	3951.21
	14	1980			19.56	0.44	230.79	278.53	16.40	0.10	545.82
		1990	0.08		0.02	1.18	241.04	340.43	27.36	2.31	612.42
		2000			18.46	1.94	290.73	386.27	11.29	5.91	714.59
		2001			20.45	2.24	301.73	413.57	10.10	7.67	755.75
		2003			19.01	1.95	268.67	384.26	9.17	6.84	689.91
		2008			20.57	1.95	269.40	416.23	9.29	7.24	724.68
		2013			20.38	1.88	248.65	412.89	8.99	7.20	700.00
	15	1980	12.16		94.06	13.88	674.39	249.96	43.04	50.66	1138.15
		1990	38.62		108.47	21.00	377.01	528.56	142.00	79.79	1295.45
		2000	32.80		107.85	24.77	324.27	367.96	95.49	82.38	1035.52
		2001	37.51		121.45	24.50	347.05	405.99	105.18	80.94	1122.62
		2003	36.85		119.32	25.08	333.71	406.44	104.67	82.47	1108.54
		2008	37.37		120.93	25.84	323.91	419.19	102.55	84.90	1114.68
		2013	36.85		119.10	23.03	305.87	415.55	103.32	75.60	1079.32
Streetlighting	0	1980	36.42		335.02	3.31	451.53	568.83	90.26	56.05	1541.42
		1990	19.53		238.98	4.97	331.63	443.64	49.28	66.44	1154.46
		2000	21.45		215.68	8.07	402.34	485.32	71.78	80.52	1285.15
		2001	21.39		218.21	10.43	349.60	512.36	70.79	78.17	1260.94
		2003	21.63		218.00	10.96	359.44	523.45	73.15	79.97	1286.59
		2008	22.15		217.42	12.26	382.76	553.81	78.41	84.37	1351.17
		2013	22.73		217.90	13.47	401.90	585.73	81.69	88.37	1411.78
TCU	40	1980	6.21		19.02	5.73	56.35	39.09	0.80	14.34	141.56
		1990	0.20		19.26	3.32	44.74	50.55	1.30	10.13	129.49
		2000	0.20		29.86	3.72	49.48	56.57	1.60	2.41	143.84
		2001	0.20		28.36	3.52	47.83	58.15	1.70	1.61	141.37
		2003	0.20		25.71	3.32	44.74	53.61	1.50	1.40	130.48
		2008	0.20		25.60	5.63	71.36	55.29	1.30	1.30	160.68
		2013	0.20		25.94	8.14	99.64	58.05	1.20	1.20	194.38
	411	1980	0.10		29.29	0.10	231.13	9.18	2.40	1.20	273.40
		1990	0.20		59.61	0.20	278.38	39.69	32.27	1.10	411.45
		2000	0.20		144.36	0.40	99.93	91.42	46.55	24.38	407.23
		2001	0.20		144.59	0.40	89.57	86.98	51.15	24.08	396.96
		2003	0.20		149.09	0.40	91.79	91.32	53.35	24.78	410.92
		2008	0.20		159.81	0.50	96.34	102.57	57.64	26.18	443.25
		2013	0.20		171.34	0.50	100.02	115.01	61.04	27.49	475.60
	412-417,	1980	2.40		27.79	2.21	39.31	31.99	3.50	7.32	114.52
		1990	16.03		48.54	1.91	40.28	55.88	21.58	2.21	186.42
		2000	21.13		22.71	2.92	67.59	36.92	8.39	10.03	169.70
		2001	19.73		21.91	4.63	73.20	73.55	7.99	9.73	210.74
		2003	18.63		20.75	5.33	71.75	69.60	7.09	8.53	201.68
		2008	20.83		23.18	8.75	86.47	77.79	6.69	7.72	231.44
		2013	23.54		26.17	12.37	102.74	87.67	6.29	7.12	265.90
	421,423	1980	0.60		35.51	2.61	56.65	88.16	3.70	4.01	191.24
		1990	1.10		35.74	3.12	78.04	107.51	8.09	6.12	239.73
		2000	1.60		34.48	4.73	228.32	144.83	12.79	9.23	435.97
		2001	1.50		32.05	4.22	319.63	163.39	10.49	9.23	540.52
		2003	1.40		29.98	4.73	319.44	153.52	9.59	9.03	527.68
		2008	1.50		31.25	5.83	365.14	161.91	9.39	10.33	585.35
		2013	1.60		32.75	7.44	424.21	171.98	9.39	11.84	659.20
	43	1980	3.21		73.22	2.21	93.83	86.78	18.78	7.82	285.84
		1990	7.51		104.12	2.31	139.92	104.45	22.08	12.34	392.73
		2000	9.11		98.47	3.72	209.15	170.99	43.46	11.54	546.43
		2001	9.01		93.62	3.82	209.73	157.46	38.96	11.64	524.25
		2003	9.21		95.47	4.12	222.13	160.52	37.06	11.84	540.36
		2008	10.42		108.61	4.22	253.69	182.74	43.26	13.34	616.28
		2013	11.62		120.61	4.02	280.32	202.88	49.25	14.85	683.54
	441-445	1980	0.00		0.00	0.00	3.78	4.54	0.40	0.00	8.72
		1990	0.00		0.00	0.10	8.13	10.56	1.50	0.00	20.30
		2000	0.00		15.80	0.00	7.55	27.25	0.70	0.00	51.30
		2001	0.00		14.99	0.10	8.52	23.40	0.50	0.00	47.51
		2003	0.00		14.76	0.20	9.10	23.10	0.50	0.00	47.66
		2008	0.00		17.99	0.20	9.59	28.04	0.40	0.00	56.21
		2013	0.00		21.91	0.30	9.97	34.16	0.40	0.00	66.74
	446	1980	0.00		0.00	1.11	98.48	29.42	11.49	0.60	141.09
		1990	0.00		0.00	1.31	73.59	53.80	8.09	3.01	139.80
		2000	0.00		86.59	1.41	76.59	94.28	13.09	3.01	274.97
		2001	0.00		82.90	1.61	77.08	82.93	12.09	2.91	259.51
		2003	0.00		80.60	3.12	83.76	80.66	11.09	2.61	261.82
		2008	0.00		94.32	3.82	92.76	94.28	10.79	2.51	298.48
		2013	0.00		110.69	4.52	101.96	110.77	10.59	2.51	341.04

TABLE J-1
Nonresidential Electricity Consumption Forecast by SIC and Planning Area (GWh)
(Excluding Commercial)

Sector	SIC	Year	BGP	DWR	LADWP	OTHER	PGE	SCE	SDGE	SMUD	Total
TCU	451-452	1980	0.50		0.00	0.10	11.52	12.24	11.49	0.60	36.46
		1990	2.10		0.00	0.00	18.20	21.23	12.59	1.71	55.83
		2000	1.90		40.36	0.00	26.43	55.68	9.19	4.01	137.58
		2001	1.90		38.51	0.00	23.72	43.83	8.49	3.91	120.37
		2003	1.80		36.09	0.00	26.43	42.06	7.29	3.61	117.29
		2008	1.80		37.70	0.00	27.60	46.89	5.89	3.71	123.60
		2013	1.90		39.66	0.00	28.56	52.32	4.99	3.81	131.26
	458	1980	5.21		218.38	2.51	261.54	35.24	12.09	86.27	621.24
		1990	7.91		257.35	1.41	312.66	52.03	21.88	16.35	669.59
		2000	9.31		183.45	1.91	384.99	84.41	23.48	30.29	717.84
		2001	9.11		180.79	1.81	410.94	83.82	48.15	30.29	764.92
		2003	8.51		169.15	4.52	470.01	79.18	40.76	28.09	800.22
		2008	8.91		177.22	5.63	522.01	85.10	32.47	28.59	859.93
		2013	9.41		185.98	6.43	574.49	91.52	26.47	29.19	923.50
	46	1980	0.00		13.84	0.00	145.53	173.06	12.39	1.00	345.82
		1990	0.00		25.60	0.00	417.33	238.52	1.50	0.00	682.95
		2000	0.00		10.84	0.20	530.62	437.74	0.50	0.10	980.00
		2001	0.00		10.38	0.20	515.71	399.44	1.90	0.10	927.73
		2003	0.00		10.38	0.20	515.71	399.44	1.90	0.10	927.73
		2008	0.00		10.38	0.20	515.71	399.44	1.90	0.10	927.73
		2013	0.00		10.38	0.20	515.71	399.44	1.90	0.10	927.73
	47	1980	3.21		22.25	7.74	31.37	30.31	2.50	1.81	99.18
		1990	3.21		20.52	12.07	67.49	59.93	14.29	4.92	182.41
		2000	1.50		19.72	10.66	72.72	99.22	12.89	7.42	224.12
		2001	1.30		18.56	10.56	57.61	90.92	13.09	7.22	199.27
		2003	1.20		17.53	0.80	53.35	88.56	12.09	6.62	180.15
		2008	1.40		19.02	1.21	55.68	103.86	12.19	6.62	199.98
		2013	1.60		20.87	271.07	61.29	122.81	12.39	6.62	496.66
	481	1980	14.22		372.54	15.48	384.12	418.49	67.43	55.47	1327.76
		1990	26.44		421.20	17.19	429.92	556.51	109.19	115.96	1676.41
		2000	30.25		312.35	22.22	786.35	787.03	219.27	169.93	2327.40
		2001	31.65		316.96	21.92	638.49	771.43	302.29	187.99	2270.73
		2003	32.65		321.92	23.63	671.12	806.28	319.87	198.02	2373.49
		2008	35.05		332.41	27.75	749.75	894.34	359.33	223.10	2621.74
		2013	37.66		343.37	32.07	828.28	989.90	394.59	248.88	2874.76
	482	1980	0.10		0.00	0.10	7.94	10.66	0.20	0.40	19.40
		1990	0.00		0.00	0.00	3.49	5.92	0.50	0.20	10.11
		2000	0.00		0.12	0.00	0.19	3.75	2.40	0.10	6.56
		2001	0.00		0.12	0.00	0.10	3.65	1.70	0.10	5.66
		2003	0.00		0.12	0.00	0.10	3.26	1.50	0.10	5.07
		2008	0.00		0.12	0.00	0.10	3.16	1.40	0.10	4.87
		2013	0.00		0.12	0.00	0.10	3.16	1.40	0.10	4.87
	483	1980	5.31		0.00	3.22	76.01	50.55	8.79	14.75	158.62
		1990	3.71		0.00	4.52	130.33	59.83	18.38	23.67	240.44
		2000	6.21		96.28	5.93	186.11	100.60	21.18	34.01	450.31
		2001	7.11		91.90	6.23	200.34	98.03	21.98	31.90	457.49
		2003	7.31		91.78	6.74	202.57	102.28	22.88	32.70	466.25
		2008	7.81		90.86	7.84	206.05	113.43	24.57	34.41	484.98
		2013	8.41		90.05	9.05	207.80	125.97	25.87	35.91	503.07
	489	1980	0.10		0.00	0.80	30.79	24.88	9.59	0.00	66.16
		1990	0.70		0.00	5.23	78.04	117.68	22.48	5.52	229.65
		2000	3.71		41.05	6.33	144.08	202.38	55.34	9.13	462.02
		2001	12.62		40.24	7.74	166.45	205.84	66.53	10.23	509.65
		2003	13.02		40.59	8.35	168.29	214.72	69.83	10.83	525.63
		2008	13.92		41.16	9.75	171.19	238.12	77.12	12.24	563.51
		2013	14.92		41.85	11.16	172.65	264.48	83.21	13.74	602.02
	491-493	1980	3.00		0.00	36.60	167.22	140.68	35.86	12.84	396.21
		1990	3.61		0.00	227.14	231.32	601.43	14.49	26.18	1104.16
		2000	4.41		166.96	96.52	407.07	244.34	7.89	70.52	997.71
		2001	4.61		167.42	121.66	405.04	235.46	12.59	51.66	998.43
		2003	4.01		144.82	150.52	409.20	199.52	10.49	48.25	966.80
		2008	3.61		126.02	204.91	496.83	165.16	8.69	51.06	1056.29
		2013	3.31		110.23	243.83	583.01	137.32	7.09	53.97	1138.75
	495	1980	0.00		96.28	5.73	313.63	231.61	96.70	27.39	771.33
		1990	1.00		296.79	27.15	644.20	472.79	34.46	2.01	1478.40
		2000	2.20		288.48	39.92	785.28	749.22	48.55	117.17	2030.82
		2001	2.60		303.36	35.19	783.15	757.61	48.55	65.40	1995.87
		2003	2.70		304.97	37.40	810.94	780.21	50.65	67.91	2054.80
		2008	2.90		307.39	42.33	872.53	833.33	54.74	73.63	2186.86
		2013	3.10		309.59	47.16	928.59	888.61	57.94	79.15	2314.14
	97	1980	0.60		149.89	22.72	888.21	663.92	532.15	25.08	2282.58
		1990	0.80		19.26	15.08	1261.10	1175.01	943.13	310.67	3725.06
		2000	1.30		6.92	20.61	844.74	913.20	914.56	29.69	2731.02
		2001	1.30		6.80	19.71	894.02	847.35	843.53	15.45	2628.16
		2003	1.30		6.80	19.91	903.80	843.99	849.53	15.45	2640.78
		2008	1.50		7.61	19.41	955.80	913.89	919.16	16.65	2834.01
		2013	1.70		8.19	17.29	963.35	965.42	971.10	17.66	2944.71

Table K-1
Cumulative Annual Electricity Savings by Program Type (GWh)

Standards Effects through 2013
Program Savings through 2001

Program	Utility Area	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Appliance Standards																						
	BGP	-	-	-	-	0	1	2	6	10	15	20	25	30	35	41	46	52	61	67	75	83
	LADWP	-	-	-	-	2	6	20	43	77	113	154	193	240	279	320	352	393	443	486	540	591
	OTHER	-	-	-	-	1	3	12	26	47	73	99	126	160	191	222	250	277	312	342	381	416
	PGE	-	-	-	-	7	26	78	148	256	378	507	646	844	1,019	1,210	1,391	1,549	1,736	1,917	2,090	2,267
	SCE	-	-	-	-	5	17	57	125	236	384	547	718	918	1,121	1,309	1,481	1,653	1,840	2,010	2,294	2,537
	SDGE	-	-	-	-	1	5	13	23	45	78	113	151	204	249	298	338	377	426	462	520	576
	SMUD	-	-	-	-	1	4	12	23	40	62	92	113	138	161	188	213	243	269	295	323	351
	APPL.STDS Total	-	-	-	-	16	63	194	395	713	1,102	1,531	1,973	2,535	3,055	3,587	4,070	4,545	5,086	5,580	6,223	6,821
Building Standards																						
	BGP	0	1	2	9	18	23	27	27	20	20	19	15	18	24	23	27	31	35	38	43	49
	LADWP	3	8	14	52	94	105	127	114	118	154	189	233	281	332	382	425	458	526	564	480	542
	OTHER	4	11	19	27	39	46	51	52	56	67	80	93	104	116	128	136	145	164	172	183	193
	PGE	18	50	88	258	441	550	597	653	727	836	912	983	1,087	1,233	1,358	1,426	1,496	1,561	1,592	1,819	1,934
	SCE	14	39	71	169	271	289	322	312	336	456	576	729	871	1,045	1,186	1,293	1,375	1,488	1,559	1,712	1,867
	SDGE	5	15	27	60	97	116	126	134	137	190	241	279	317	385	444	488	514	528	535	595	653
	SMUD	10	23	40	60	78	96	109	114	127	155	202	232	250	277	305	321	339	372	386	411	436
	BLDG.STDS Total	56	148	260	635	1,039	1,225	1,360	1,406	1,521	1,878	2,221	2,563	2,928	3,412	3,827	4,116	4,358	4,675	4,846	5,243	5,673
Conservation/Efficiency Programs																						
	LADWP	-	-	0	1	1	28	233	314	461	520	573	570	558	526	486	427	364	332	320	306	308
	PGE	-	119	243	418	603	893	1,249	1,566	1,884	2,549	3,164	3,805	3,897	3,920	3,963	4,060	4,437	4,748	5,028	5,361	5,558
	SCE	-	-	404	890	1,694	2,608	3,585	4,688	5,766	6,696	7,487	7,962	8,175	8,209	8,171	8,205	8,310	8,499	8,836	9,136	8,757
	SDGE	-	-	-	80	99	158	203	287	361	368	365	353	326	299	287	312	383	464	565	692	915
	SMUD	-	-	1	3	4	5	11	17	23	30	36	43	49	56	67	88	144	253	339	492	625
	Conservation Total	-	119	648	1,392	2,401	3,692	5,281	6,872	8,494	10,162	11,626	12,733	13,005	13,010	12,973	13,091	13,637	14,296	15,088	15,987	16,162
Fuel Substitution																						
	PGE	-	-	-	-	-	-	-	-	-	-	-	-	17	40	76	111	126	126	126	133	138
	SCE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(3)	(3)	(11)	(11)
	SCG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	172	184	253	311	313	318
	SDGE	-	-	-	-	-	-	-	-	-	-	-	8	12	16	21	22	27	27	29	28	27
	F-Sub Total	-	-	-	-	-	-	-	-	-	-	-	8	30	55	97	306	337	402	462	462	473
Load Management																						
	LADWP	-	-	-	-	-	-	1	2	3	3	4	3	2	1	1	0	0	0	0	0	0
	PGE	-	-	-	6	11	14	18	18	18	18	18	18	18	17	13	11	9	6	3	1	(1)
	SCE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
	SDGE	-	-	-	-	6	15	14	12	9	6	4	2	3	5	6	4	5	5	5	5	5
	SMUD	-	-	-	4	4	3	3	2	1	1	1	1	1	1	1	0	(0)	(0)	(1)	(1)	(1)
	LM-ND Total	-	-	-	10	20	32	35	34	31	29	26	23	24	24	21	15	14	11	8	5	3
Public Agency Programs																						
	BGP	-	-	0	0	1	5	7	12	16	20	23	26	26	26	26	26	25	25	25	23	21
	LADWP	-	-	0	1	4	18	38	59	72	91	109	127	129	136	138	141	140	138	136	133	128
	OTHER	-	-	0	0	1	2	6	12	17	24	30	37	37	37	38	39	42	44	46	48	48
	PGE	-	-	2	4	22	63	136	235	315	426	523	623	631	646	657	662	679	688	678	661	638
	SCE	-	-	1	2	8	33	73	122	164	222	280	340	345	354	366	372	379	383	384	387	379
	SDGE	-	-	0	1	2	6	18	34	47	64	78	92	94	97	97	101	103	101	98	94	88
	SMUD	-	-	0	0	1	4	10	17	24	32	40	48	49	49	49	49	49	48	47	45	43
	Public Total	-	-	4	8	39	132	287	492	654	879	1,083	1,293	1,311	1,345	1,372	1,390	1,417	1,427	1,413	1,391	1,345
Total Cumulative GWH		56	266	912	2,045	3,516	5,145	7,158	9,199	11,413	14,049	16,488	18,593	19,832	20,901	21,876	22,988	24,309	25,897	27,395	29,313	30,477

Table K-1
Cumulative Annual Electricity Savings by Program Type (GWh)

Standards Effects through 2013
Program Savings through 2001

Program	Utility Area	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Appliance Standards																			
	BGP	91	98	106	113	120	128	134	141	148	155	161	168	174	179	185	191	196	202
	LADWP	640	688	735	782	829	873	916	958	999	1,040	1,079	1,115	1,150	1,185	1,218	1,250	1,280	1,308
	OTHER	451	485	519	552	585	617	648	678	707	736	764	791	817	842	866	889	911	933
	PGE	2,444	2,620	2,796	2,970	3,139	3,302	3,465	3,626	3,782	3,936	4,084	4,234	4,378	4,519	4,653	4,785	4,917	5,044
	SCE	2,786	3,038	3,288	3,541	3,795	4,045	4,287	4,536	4,779	5,011	5,237	5,453	5,669	5,876	6,076	6,271	6,456	6,637
	SDGE	634	694	750	807	869	931	989	1,044	1,101	1,157	1,210	1,260	1,308	1,353	1,400	1,443	1,486	1,528
	SMUD	379	406	433	461	487	512	538	563	589	613	635	658	681	702	723	742	763	782
	APPL.STDS Total	7,424	8,029	8,628	9,227	9,823	10,408	10,977	11,546	12,106	12,648	13,170	13,677	14,177	14,655	15,121	15,570	16,009	16,432
Building Standards																			
	BGP	54	61	67	74	80	88	94	101	109	117	124	132	139	147	154	161	169	176
	LADWP	589	641	694	749	803	857	912	966	1,021	1,078	1,132	1,187	1,239	1,291	1,343	1,395	1,446	1,498
	OTHER	202	210	220	229	238	246	254	263	271	279	287	296	303	310	317	324	332	339
	PGE	1,986	2,067	2,159	2,248	2,334	2,412	2,494	2,568	2,652	2,757	2,865	2,978	3,084	3,181	3,268	3,360	3,456	3,551
	SCE	2,037	2,227	2,426	2,630	2,844	3,055	3,269	3,504	3,732	3,947	4,164	4,369	4,581	4,780	4,984	5,185	5,379	5,576
	SDGE	708	778	838	899	976	1,051	1,119	1,183	1,255	1,331	1,403	1,463	1,523	1,587	1,655	1,714	1,778	1,840
	SMUD	458	479	501	523	543	564	587	609	630	653	674	696	715	732	749	765	782	800
	BLDG.STDS Total	6,033	6,463	6,905	7,352	7,818	8,274	8,729	9,194	9,671	10,162	10,649	11,121	11,584	12,028	12,470	12,905	13,341	13,780
Conservation/Efficiency Programs																			
	LADWP	291	290	280	271	264	239	217	195	172	148	124	102	84	71	62	56	51	47
	PGE	5,583	5,684	5,828	5,820	5,936	6,358	5,857	5,401	4,899	4,407	3,945	3,475	3,040	2,629	2,247	1,917	1,687	1,496
	SCE	8,667	8,510	8,298	8,103	8,007	7,917	7,302	6,718	6,151	5,601	5,074	4,571	4,100	3,640	3,191	2,763	2,349	1,991
	SDGE	1,233	1,447	1,537	1,632	1,764	1,863	1,790	1,700	1,595	1,472	1,348	1,216	1,089	980	887	802	724	653
	SMUD	703	730	758	773	786	765	735	693	638	569	489	407	329	262	209	170	141	120
	Conservation Total	16,477	16,661	16,702	16,599	16,757	31,793	29,454	27,166	24,774	22,384	20,091	17,817	15,707	13,736	11,931	10,336	9,012	7,886
Fuel Substitution																			
	PGE	138	138	138	138	138	138	137	136	134	130	123	112	96	77	57	40	27	18
	SCE	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(10)	(10)	(10)	(9)	(8)	(6)
	SCG	340	341	341	341	341	341	341	340	339	336	331	322	304	274	233	185	137	96
	SDGE	27	30	28	28	28	28	28	27	26	24	22	18	15	12	8	6	4	3
	F-Sub Total	495	498	497	497	496	496	495	493	489	480	466	441	404	352	288	221	160	110
Load Management																			
	LADWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PGE	(0)	(1)	(1)	(1)	(1)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
	SCE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SDGE	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	SMUD	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
	LM-ND Total	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Public Agency Programs																			
	BGP	19	17	15	13	12	11	10	9	9	8	7	6	5	5	4	4	4	3
	LADWP	123	116	109	101	94	86	80	75	70	65	60	54	48	43	38	35	33	31
	OTHER	47	45	42	39	35	32	29	26	23	20	17	14	10	7	5	3	2	1
	PGE	612	576	533	487	445	398	357	320	285	248	208	168	131	97	70	49	36	29
	SCE	366	351	331	306	283	255	230	207	185	163	139	115	93	73	58	46	39	35
	SDGE	82	75	67	60	53	46	40	35	31	27	23	19	15	12	9	7	5	5
	SMUD	41	39	36	36	33	30	27	25	22	19	16	12	9	7	4	3	2	1
	Public Total	1,290	1,218	1,134	1,043	955	859	774	699	626	550	469	388	311	243	188	147	120	105
Total Cumulative GWH		31,723	32,874	33,868	34,720	35,853	51,832	50,431	49,100	47,669	46,228	44,848	43,448	42,186	41,018	40,001	39,182	38,645	38,316

Appendix L: Load and Temperature

For illustrative purposes, the state is broken into three temperature regions; north, south and San Diego. San Diego has been differentiated from the rest of southern California due to its mild climate. To account for summer heat buildup, staff uses a three-day moving average of the maximum temperatures to correlate with the system summer loads. This moving average is calculated as 60 percent of the current day's maximum temperature, 30 percent of the previous day's maximum temperature and 10 percent of the second previous day's maximum temperature. **Table L-1** shows the weights used to develop statewide or regional temperatures. These are based on the estimated saturation of residential air conditioning.

Table L-1
Regional Temperature Weights for Weather Stations

Weather Station	North Region	South Region	State
Ukiah	6%	0%	2%
Sacramento	29%	0%	11%
Fresno	35%	5%	16%
San Jose	27%	0%	10%
San Francisco	3%	0%	1%
Long Beach	0%	33%	18%
Burbank	0%	33%	18%
Riverside	0%	29%	16%
San Diego	0%	0%	7%

Figures L-1 and L-2 show the 1950-2002 three-day weighted average May through September average maximum temperatures for the south region and north region weather stations. **Figure L-3** provides the 1950-2002 weighted three-day moving average maximum temperatures for the total state as well as the north, south and San Diego regions. The regional combination of temperatures creates statewide maximum temperatures in the late July to mid-August time frame.

Figures L-4 through L-8 show the relationship of hot summer statewide temperatures to the temperatures in both the north and south regions for the last five summers as well as the top 20 CAISO peak days for each year. With very few exceptions statewide temperatures over 95 degrees occur only when both the north and south region temperatures exceed 95 degrees. These occurrences were most prevalent in 1998. These charts also show the relationship of high statewide temperatures to high CAISO loads. Of the last five summers, 1998 had the greatest number of days with statewide temperatures of 95 degrees F or higher. What should be noted is the difference in temperature patterns between the years. These temperature patterns yield load patterns that follow the temperatures, but each year is unique. The hot days in 1998 were clustered in a six-week period from mid-July to early September. 1999 was relatively cool and had three relatively short heat episodes essentially one month apart from each other. The hot episodes for 2000, 2001 and 2002 were more evenly distributed throughout the summer. What is important is that these hot summer episodes cause the needle peaks that California experiences.

Figure L-9 provides an indication of the variation of the frequency of hot temperatures by year for the last 53 years. 1962 had no days exceeding 95.0 degrees while 1984 had 24 days exceeding 95.0 degrees. This is an indication of the kind of diverse weather conditions that can be faced in the electricity planning process.

Figure L-1
North Region 1950-2002 3-day weighted moving average maximum temperatures

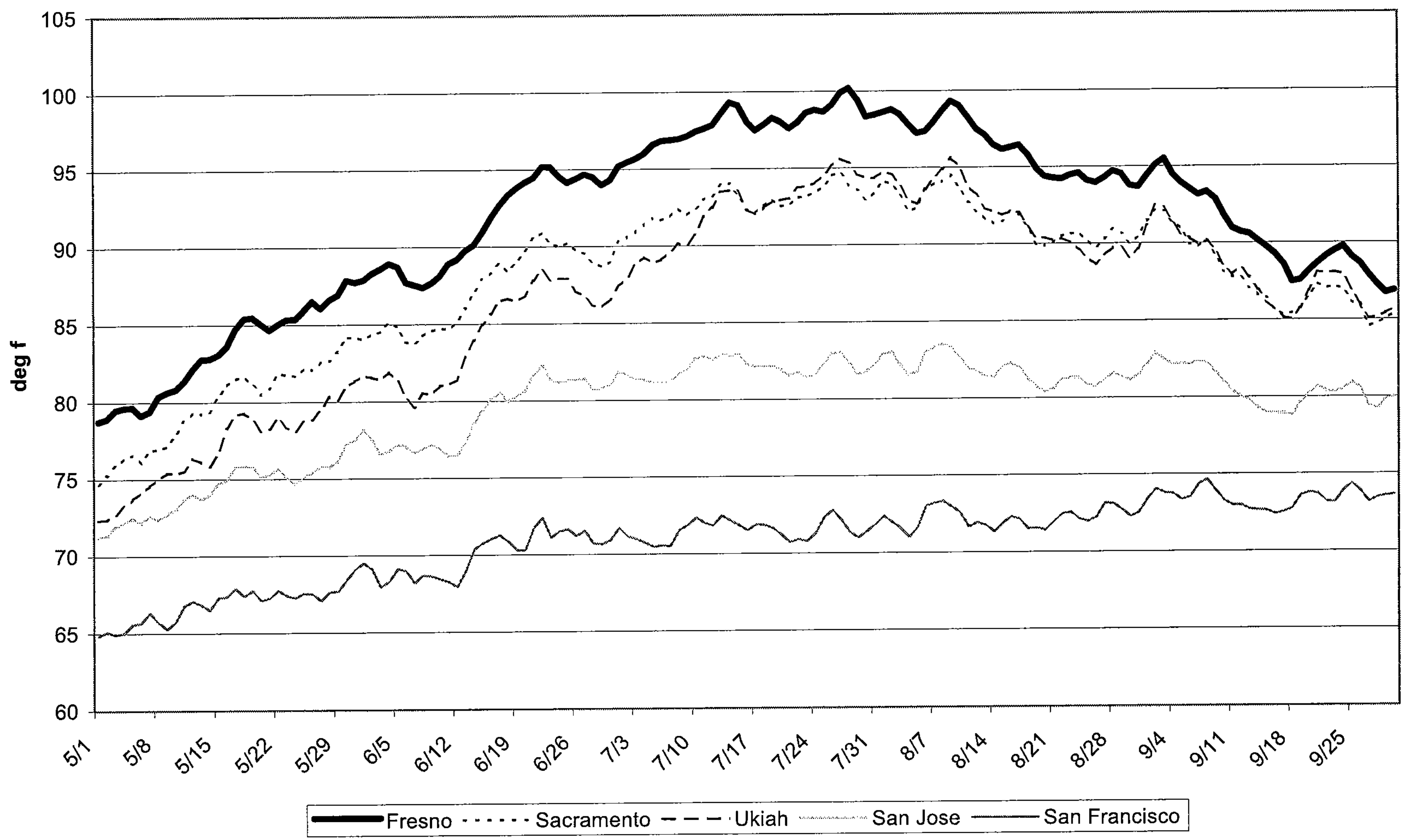

Figure L-2
South Region 1950-2002 3-day weighted moving average maximum temperatures

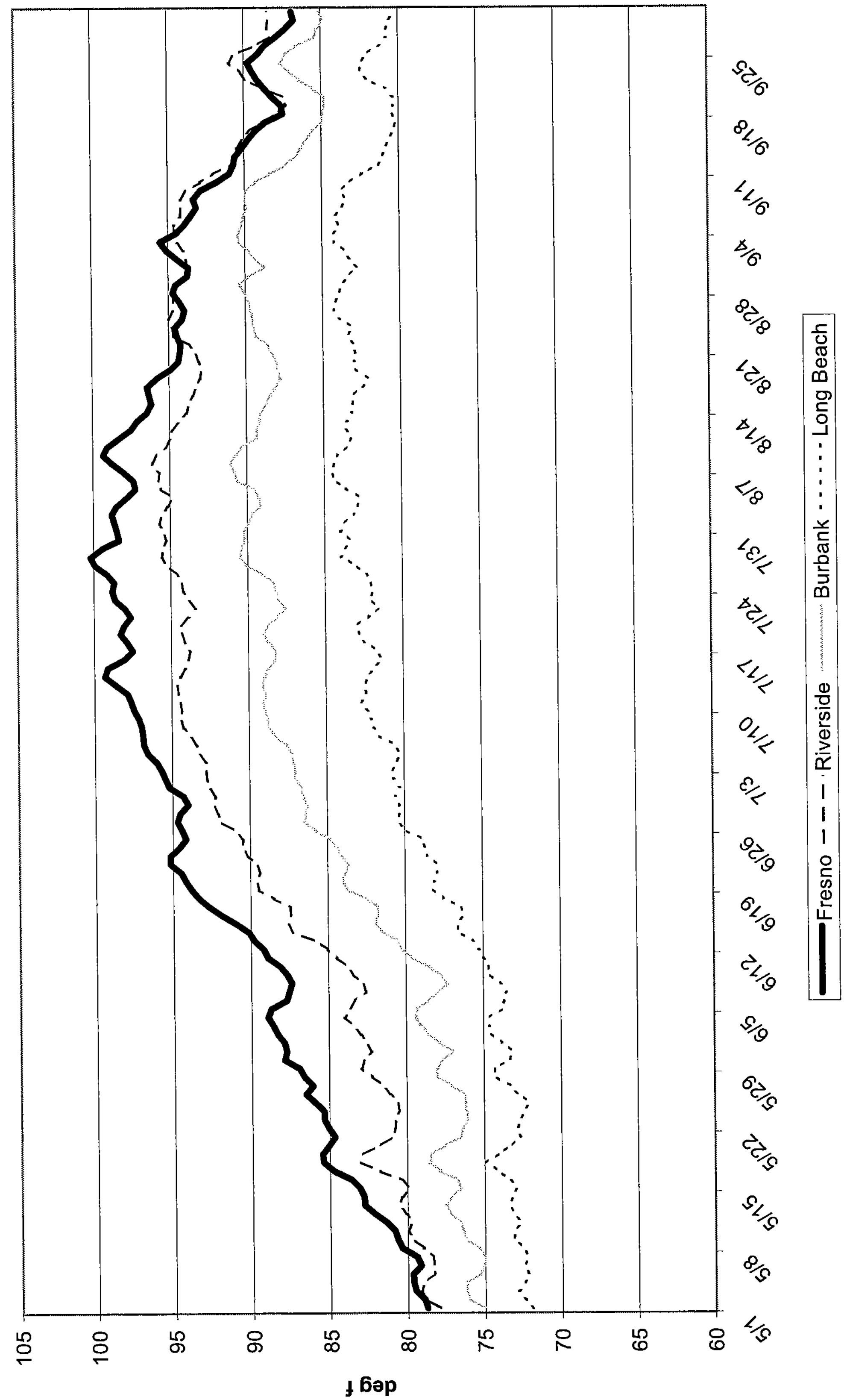

Figure L-3
A/C Weighted 1950-2002 Regional 3-day moving average maximum temperatures

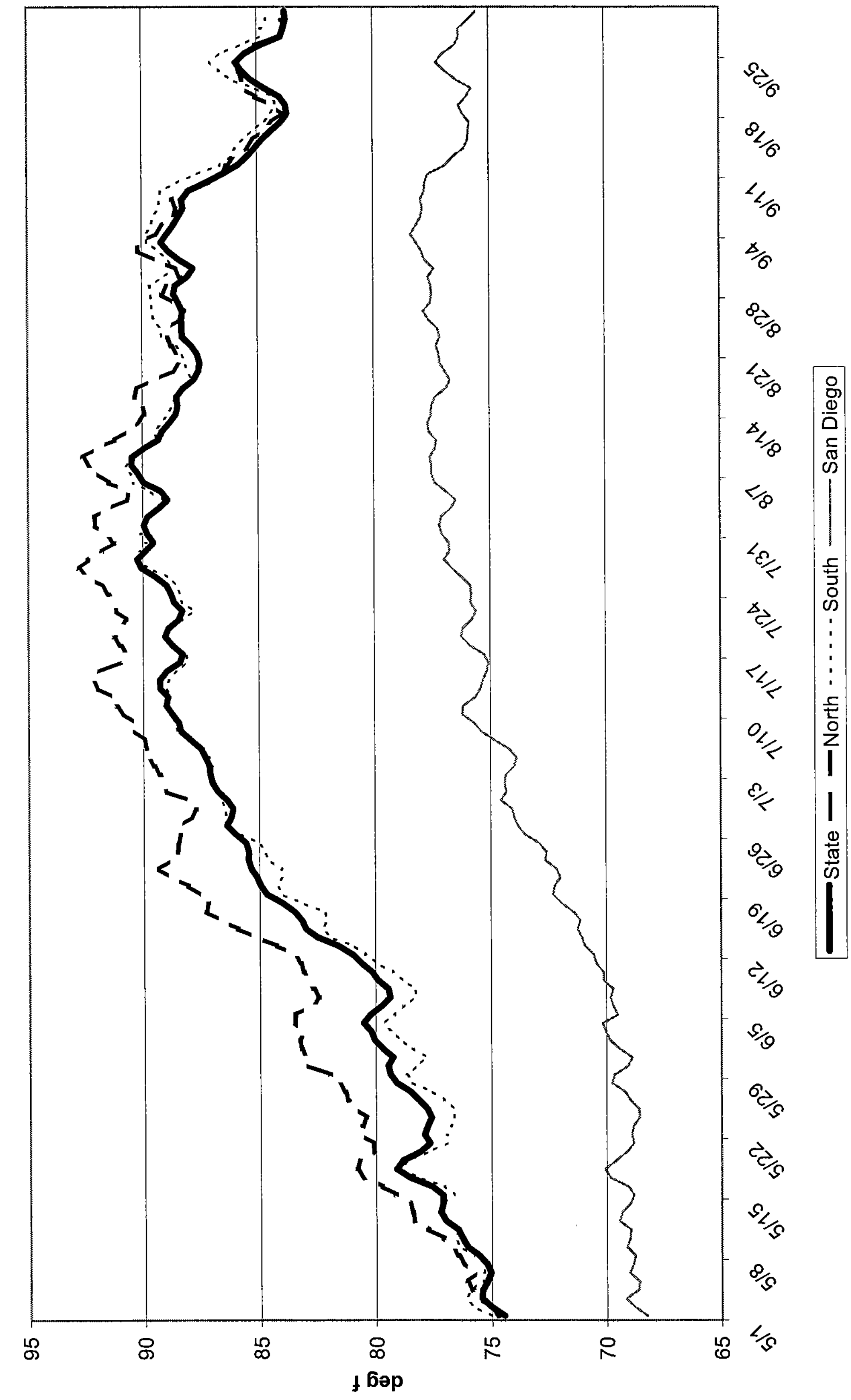

Figure L-4
1998 Composite 3-day moving average maximum temperatures and CAISO top 20 daily peaks

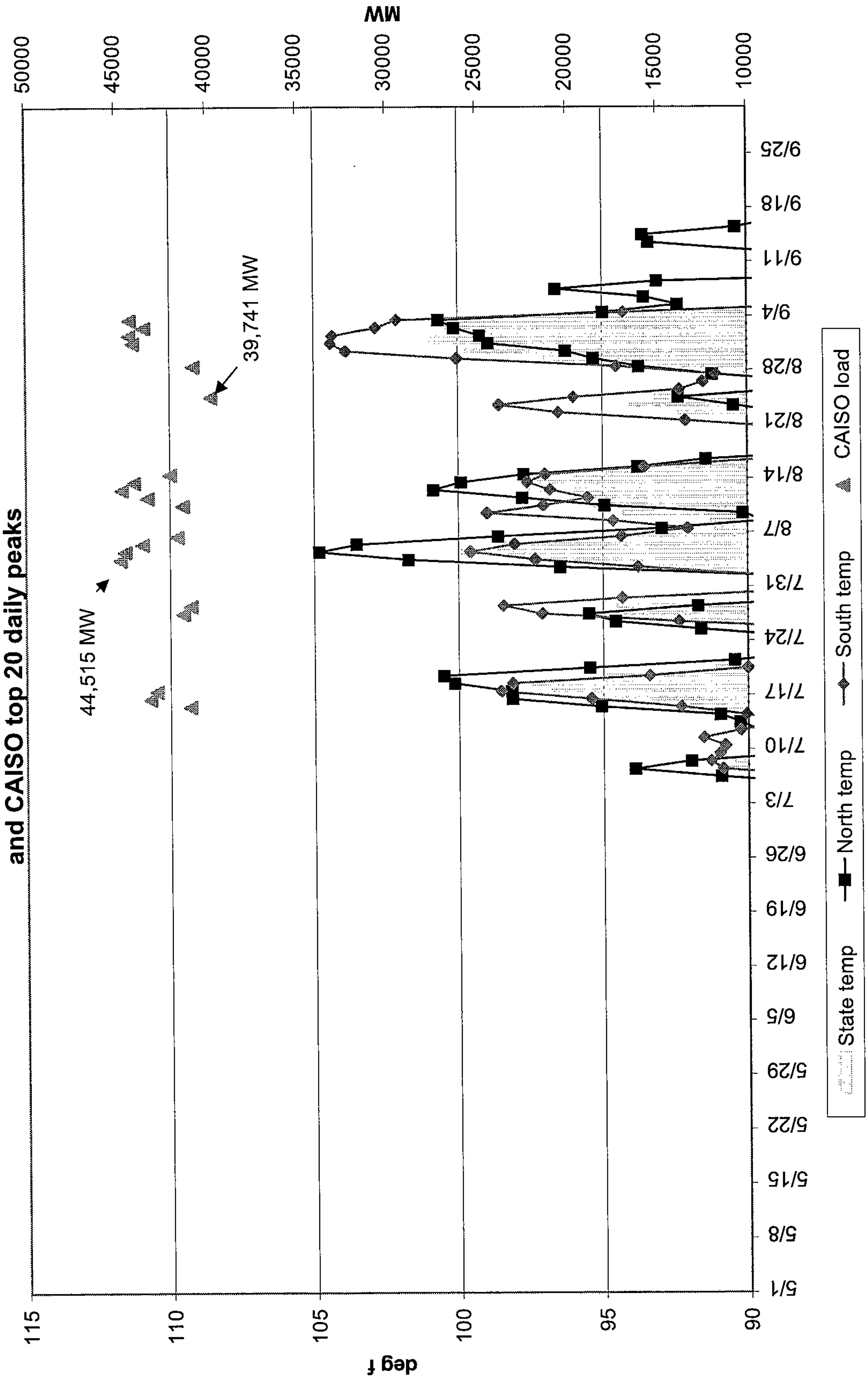

Figure L-5
1999 Composite 3-day moving average maximum temperatures and CAISO top 20 daily peaks

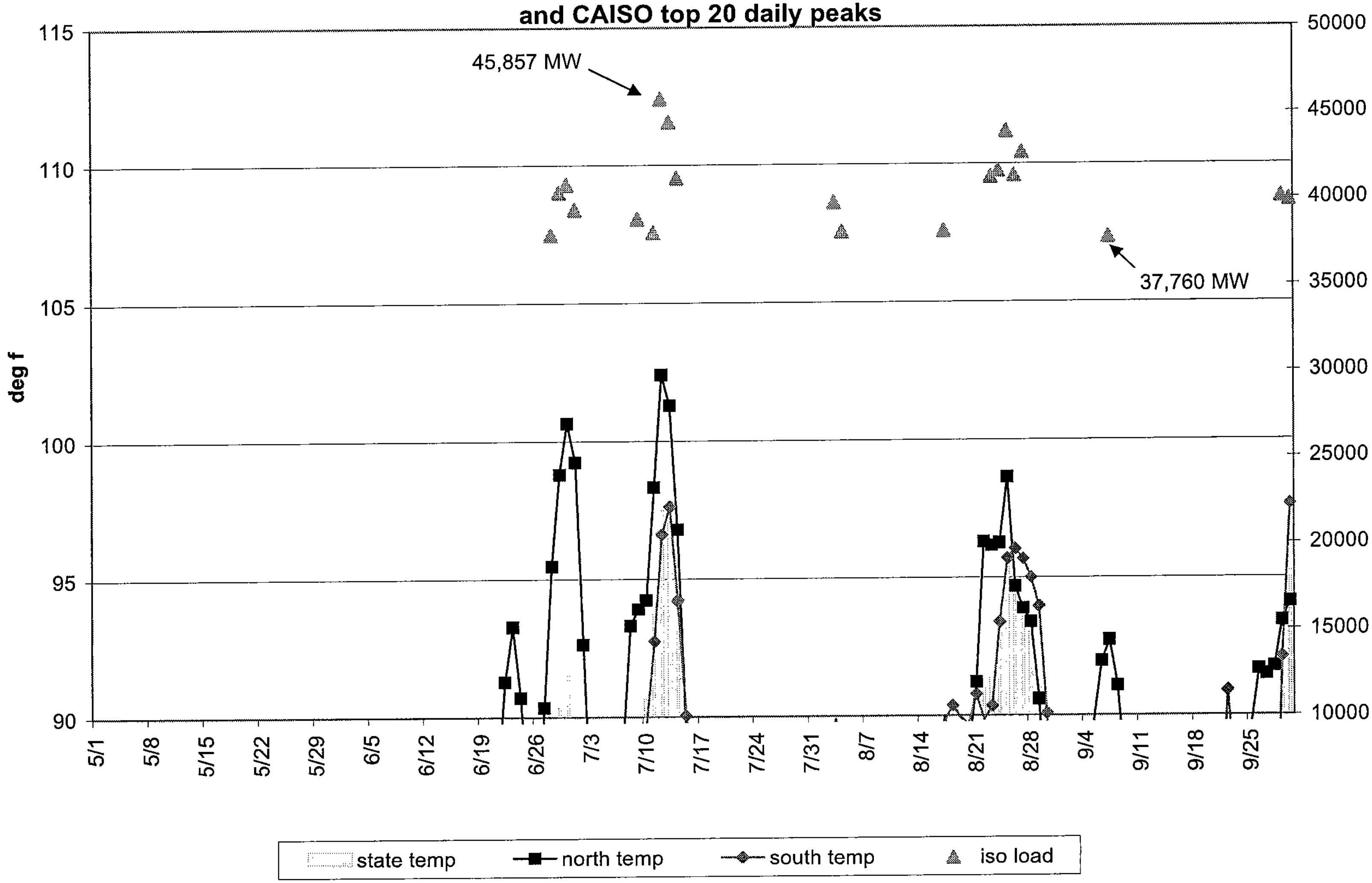

Figure L-6
2000 Composite 3-day moving average maximum temperatures and CAISO top 20 daily peaks

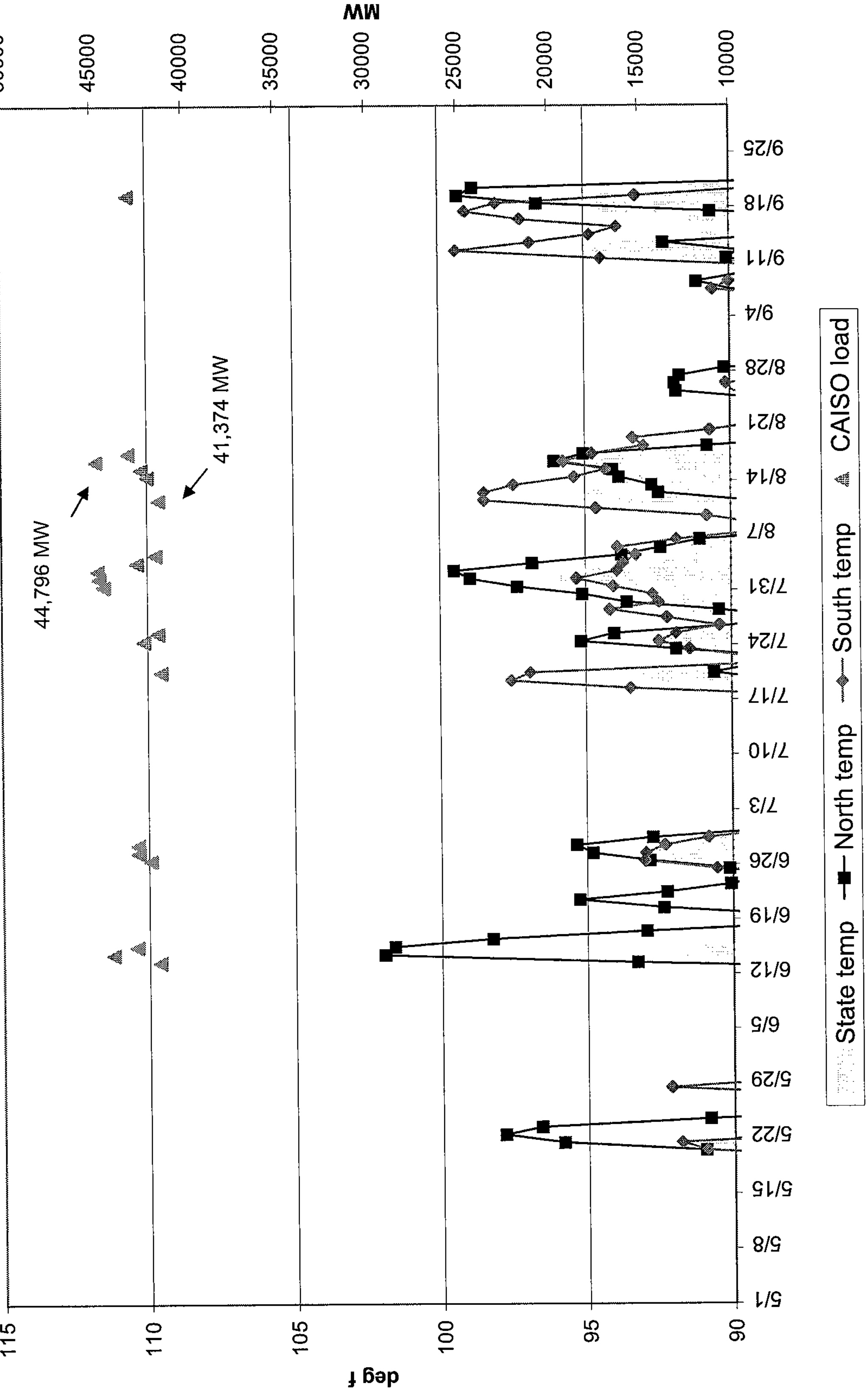

Figure L-7
2001 Composite 3-day moving average maximum temperatures and CAISO top 20 daily peaks

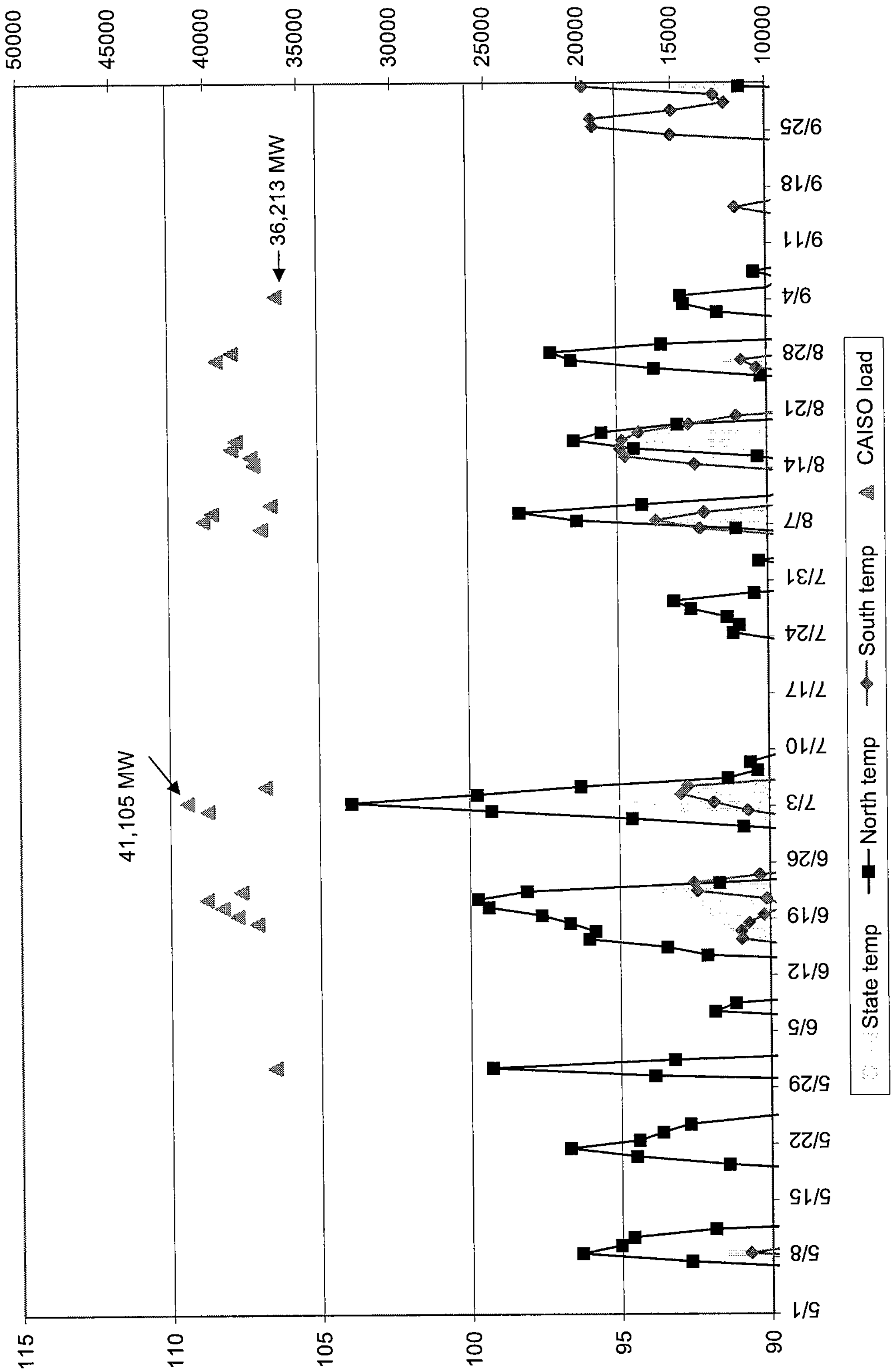

Figure L-8
2002 Composite 3-day moving average maximum temperatures and CAISO top 20 daily peaks

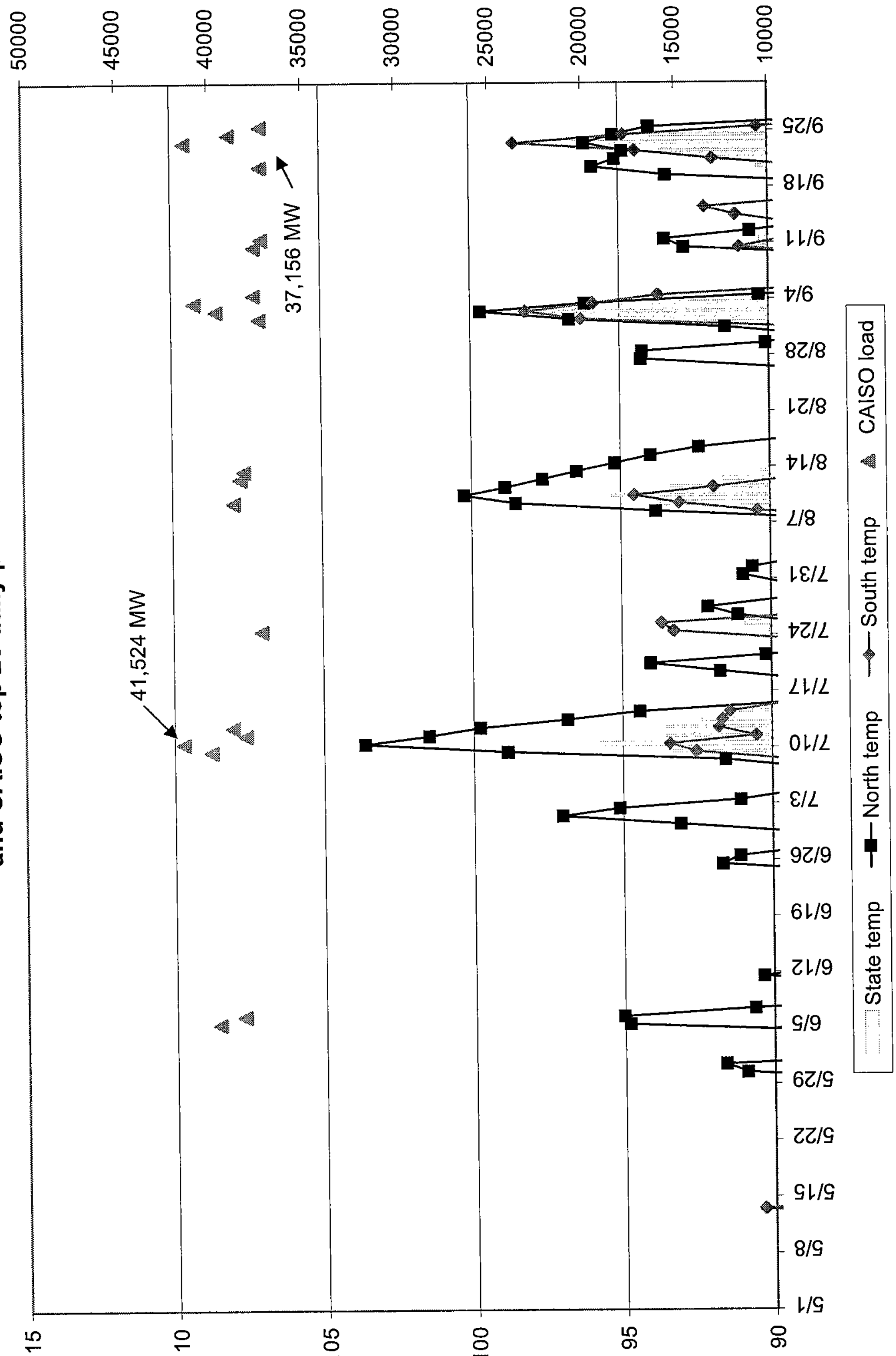

Figure L-9
Annual number of days (may-sept) where
statewide weighted 3-day moving average maximum temperature exceeded 95.0 f

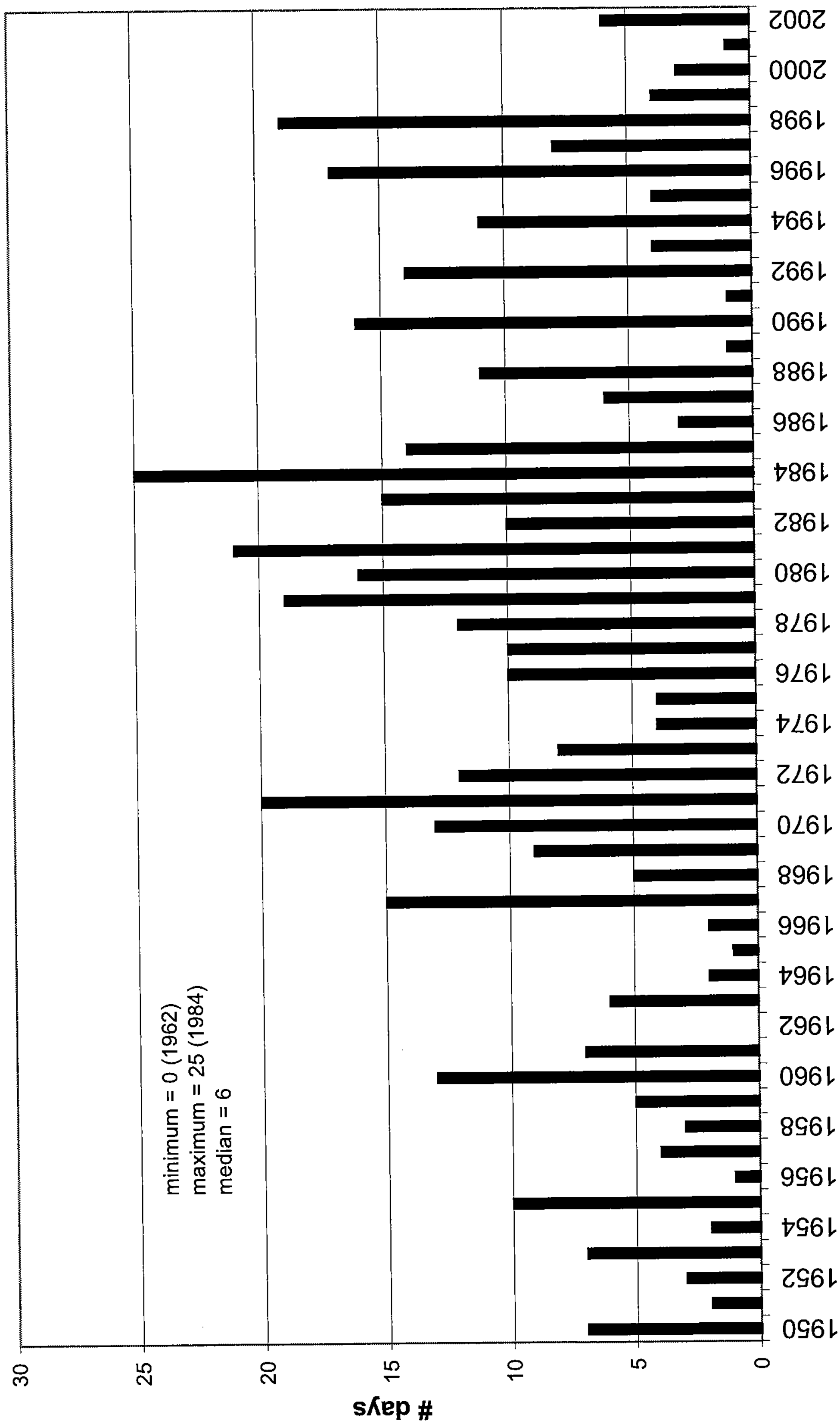

Table B-1
Staff's Outlook for the PG&E Area
Net Energy for Load (GWh)

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	66,197	6,294	72,492	631	71,861
1981	67,653	6,433	74,087	638	73,449
1982	66,043	6,270	72,313	728	71,585
1983	68,497	6,485	74,982	948	74,034
1984	73,341	6,957	80,298	874	79,424
1985	75,617	7,161	82,778	1,024	81,754
1986	74,394	6,980	81,374	1,686	79,688
1987	78,962	7,317	86,279	2,742	83,537
1988	82,141	7,559	89,700	3,402	86,298
1989	84,529	7,746	92,275	3,843	88,432
1990	86,806	7,950	94,757	3,992	90,764
1991	86,929	7,947	94,877	4,145	90,732
1992	88,326	8,077	96,403	4,188	92,215
1993	89,239	8,067	97,307	5,203	92,104
1994	89,582	8,072	97,654	5,498	92,156
1995	90,763	8,185	98,948	5,498	93,450
1996	93,464	8,354	101,817	6,445	95,373
1997	97,078	8,695	105,772	6,510	99,262
1998	95,682	8,644	104,327	5,639	98,688
1999	99,205	9,002	108,207	5,433	102,775
2000	101,980	9,295	111,275	5,158	106,117
2001	98,748	8,981	107,728	5,196	102,532
2002	97,570	8,851	106,421	5,375	101,046
2003	98,597	8,937	107,534	5,506	102,027
2004	100,940	9,156	110,096	5,561	104,535
2005	103,115	9,360	112,474	5,617	106,858
2006	105,101	9,545	114,646	5,673	108,973
2007	106,599	9,683	116,283	5,730	110,553
2008	108,699	9,880	118,579	5,787	112,792
2009	110,053	10,004	120,057	5,845	114,212
2010	111,655	10,152	121,807	5,903	115,904
2011	113,087	10,284	123,371	5,962	117,409
2012	114,441	10,408	124,850	6,022	118,828
2013	115,507	10,505	126,012	6,082	119,930

Annual Growth Rates (%)

1980-1990	2.7	2.4	2.7	20.3	2.4
1990-2000	1.6	1.6	1.6	2.6	1.6
2000-2003	-1.1	-1.3	-1.1	2.2	-1.3
2003-2008	2.0	2.0	2.0	1.0	2.0
2008-2013	1.2	1.2	1.2	1.0	1.2
2003-2013	1.6	1.6	1.6	1.0	1.6

Table B-2
Staff's Outlook for the SMUD Area
Net Energy for Load (GWh)

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	5,350	342	5,693	0	5,693
1981	5,693	364	6,057	0	6,057
1982	5,681	364	6,044	0	6,044
1983	5,954	381	6,335	0	6,335
1984	6,360	407	6,767	0	6,767
1985	6,881	440	7,322	0	7,322
1986	7,014	449	7,463	0	7,463
1987	7,419	475	7,894	0	7,894
1988	7,677	491	8,168	0	8,168
1989	7,927	507	8,434	0	8,434
1990	8,358	535	8,893	0	8,893
1991	8,349	534	8,884	0	8,884
1992	8,496	544	9,040	0	9,040
1993	8,435	540	8,974	0	8,974
1994	8,418	539	8,957	0	8,957
1995	8,458	541	8,999	0	8,999
1996	8,805	564	9,369	0	9,369
1997	9,006	576	9,583	0	9,583
1998	9,123	584	9,707	0	9,707
1999	9,326	597	9,923	0	9,923
2000	9,491	607	10,098	0	10,098
2001	9,334	597	9,931	0	9,931
2002	9,429	603	10,033	0	10,033
2003	9,563	612	10,175	0	10,175
2004	9,729	623	10,351	0	10,351
2005	9,906	634	10,540	0	10,540
2006	10,060	644	10,704	0	10,704
2007	10,214	654	10,868	0	10,868
2008	10,388	665	11,053	0	11,053
2009	10,548	675	11,223	0	11,223
2010	10,710	685	11,395	0	11,395
2011	10,869	696	11,565	0	11,565
2012	11,022	705	11,727	0	11,727
2013	11,172	715	11,886	0	11,886

Annual Growth Rates (%)

1980-1990	4.6	4.6	4.6		4.6
1990-2000	1.3	1.3	1.3		1.3
2000-2003	0.3	0.3	0.3		0.3
2003-2008	1.7	1.7	1.7		1.7
2008-2013	1.5	1.5	1.5		1.5
2003-2013	1.6	1.6	1.6		1.6

Table B-3
Staff's Outlook for the SCE Area
Net Energy for Load (GWh)

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	59,624	4,035	63,659	289	63,370
1981	61,594	4,168	65,763	296	65,467
1982	59,501	4,013	63,514	492	63,022
1983	62,006	4,154	66,161	914	65,247
1984	66,608	4,454	71,063	1,103	69,960
1985	68,203	4,550	72,753	1,286	71,467
1986	69,496	4,629	74,124	1,428	72,696
1987	72,999	4,842	77,841	1,790	76,051
1988	76,698	5,010	81,709	3,019	78,690
1989	78,417	5,115	83,532	3,199	80,333
1990	81,673	5,329	87,002	3,308	83,694
1991	80,223	5,226	85,449	3,363	82,086
1992	82,041	5,347	87,388	3,408	83,979
1993	81,133	5,266	86,399	3,689	82,711
1994	82,800	5,377	88,176	3,730	84,446
1995	82,855	5,380	88,235	3,730	84,505
1996	85,728	5,562	91,290	3,933	87,357
1997	88,382	5,736	94,119	4,026	90,092
1998	88,434	5,742	94,177	3,987	90,190
1999	91,013	5,915	96,928	4,023	92,904
2000	96,496	6,293	102,789	3,954	98,835
2001	90,506	5,922	96,428	3,422	93,006
2002	89,418	5,785	95,203	4,344	90,859
2003	90,419	5,845	96,264	4,459	91,805
2004	92,813	6,005	98,818	4,503	94,315
2005	95,406	6,178	101,584	4,548	97,036
2006	97,637	6,327	103,964	4,594	99,371
2007	99,100	6,423	105,523	4,640	100,883
2008	100,745	6,532	107,277	4,686	102,591
2009	102,038	6,617	108,655	4,733	103,922
2010	103,395	6,706	110,101	4,780	105,320
2011	104,956	6,809	111,764	4,828	106,936
2012	106,541	6,913	113,454	4,876	108,578
2013	107,654	6,986	114,639	4,925	109,714

Annual Growth Rates (%)

1980-1990	3.2	2.8	3.2	27.6	2.8
1990-2000	1.7	1.7	1.7	1.8	1.7
2000-2003	-2.1	-2.4	-2.2	4.1	-2.4
2003-2008	2.2	2.2	2.2	1.0	2.2
2008-2013	1.3	1.4	1.3	1.0	1.4
2003-2013	1.8	1.8	1.8	1.0	1.8

Table B-4
Staff's Outlook for the LADWP Area
Net Energy for Load (GWh)

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	17,669	2,385	20,055	0	20,055
1981	18,340	2,476	20,816	0	20,816
1982	18,184	2,455	20,639	0	20,639
1983	18,722	2,496	21,219	230	20,989
1984	19,777	2,624	22,401	339	22,062
1985	19,760	2,625	22,385	317	22,068
1986	20,094	2,656	22,749	423	22,326
1987	20,772	2,738	23,510	488	23,022
1988	21,439	2,797	24,236	720	23,516
1989	21,555	2,787	24,341	913	23,428
1990	21,971	2,829	24,800	1,018	23,782
1991	21,635	2,762	24,396	1,178	23,218
1992	22,052	2,828	24,880	1,107	23,773
1993	22,396	2,870	25,266	1,137	24,129
1994	21,805	2,742	24,547	1,497	23,050
1995	22,526	2,827	25,352	1,587	23,765
1996	22,758	2,866	25,623	1,530	24,093
1997	23,166	2,917	26,083	1,561	24,522
1998	23,004	2,891	25,894	1,592	24,302
1999	23,058	2,894	25,952	1,624	24,328
2000	23,803	2,990	26,793	1,657	25,136
2001	23,265	2,913	26,177	1,690	24,487
2002	23,448	2,933	26,380	1,724	24,656
2003	23,703	2,967	26,670	1,724	24,946
2004	23,972	3,004	26,976	1,724	25,252
2005	24,306	3,049	27,354	1,724	25,630
2006	24,570	3,084	27,654	1,724	25,930
2007	24,739	3,107	27,846	1,724	26,122
2008	24,935	3,133	28,069	1,724	26,345
2009	25,062	3,151	28,213	1,724	26,489
2010	25,239	3,174	28,413	1,724	26,689
2011	25,448	3,203	28,651	1,724	26,927
2012	25,609	3,224	28,834	1,724	27,110
2013	25,839	3,255	29,094	1,724	27,370

Annual Growth Rates (%)

1980-1990	2.2	1.7	2.1		1.7
1990-2000	0.8	0.6	0.8	5.0	0.6
2000-2003	-0.1	-0.3	-0.2	1.3	-0.3
2003-2008	1.0	1.1	1.0	0.0	1.1
2008-2013	0.7	0.8	0.7	0.0	0.8
2003-2013	0.9	0.9	0.9	0.0	0.9

Table B-5
Staff's Outlook for the SDG&E Area
Net Energy for Load (GWh)

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	9,729	690	10,419	0	10,419
1981	9,875	700	10,575	0	10,575
1982	9,823	696	10,519	11	10,508
1983	10,073	711	10,784	50	10,734
1984	10,760	753	11,512	144	11,368
1985	11,180	775	11,955	250	11,705
1986	11,670	806	12,476	307	12,169
1987	12,367	845	13,212	447	12,765
1988	13,237	901	14,139	524	13,615
1989	13,929	952	14,881	502	14,379
1990	14,798	1,016	15,814	466	15,348
1991	14,641	1,005	15,646	470	15,176
1992	15,540	1,070	16,610	446	16,164
1993	15,451	1,066	16,517	415	16,102
1994	15,791	1,091	16,881	410	16,472
1995	15,923	1,101	17,024	400	16,624
1996	16,601	1,138	17,738	555	17,184
1997	17,132	1,187	18,319	384	17,935
1998	17,630	1,223	18,853	381	18,472
1999	18,312	1,271	19,583	381	19,202
2000	18,791	1,306	20,097	367	19,731
2001	17,822	1,238	19,060	358	18,701
2002	18,374	1,263	19,637	557	19,080
2003	18,663	1,277	19,940	648	19,292
2004	19,099	1,308	20,407	654	19,753
2005	19,541	1,339	20,879	661	20,218
2006	19,988	1,370	21,358	668	20,690
2007	20,347	1,395	21,742	674	21,068
2008	20,847	1,430	22,276	681	21,595
2009	21,194	1,454	22,647	688	21,960
2010	21,510	1,476	22,985	695	22,291
2011	21,847	1,499	23,346	702	22,645
2012	22,240	1,527	23,767	709	23,058
2013	22,518	1,546	24,064	716	23,349

Annual Growth Rates (%)

1980-1990	4.3	3.9	4.3		3.9
1990-2000	2.4	2.5	2.4	-2.4	2.5
2000-2003	-0.2	-0.7	-0.3	20.9	-0.7
2003-2008	2.2	2.3	2.2	1.0	2.3
2008-2013	1.6	1.6	1.6	1.0	1.6
2003-2013	1.9	1.9	1.9	1.0	1.9

Table B-6
Staff's Outlook for the BGP Area
Net Energy for Load (GWh)

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	2,374	152	2,526	0	2,526
1981	2,452	157	2,609	0	2,609
1982	2,399	154	2,552	0	2,552
1983	2,433	156	2,588	0	2,588
1984	2,644	169	2,813	0	2,813
1985	2,699	173	2,872	0	2,872
1986	2,695	172	2,868	0	2,868
1987	2,754	176	2,930	0	2,930
1988	2,861	183	3,044	0	3,044
1989	2,813	180	2,993	0	2,993
1990	2,951	189	3,140	0	3,140
1991	2,759	177	2,936	0	2,936
1992	2,931	188	3,118	0	3,118
1993	2,996	192	3,188	0	3,188
1994	2,999	192	3,190	0	3,190
1995	3,084	197	3,282	0	3,282
1996	3,152	202	3,353	0	3,353
1997	3,236	207	3,443	0	3,443
1998	3,298	211	3,509	0	3,509
1999	3,240	207	3,447	0	3,447
2000	3,320	212	3,533	0	3,533
2001	3,275	210	3,485	0	3,485
2002	3,343	214	3,557	0	3,557
2003	3,380	216	3,597	0	3,597
2004	3,429	219	3,648	0	3,648
2005	3,471	222	3,693	0	3,693
2006	3,504	224	3,728	0	3,728
2007	3,516	225	3,741	0	3,741
2008	3,530	226	3,755	0	3,755
2009	3,542	227	3,769	0	3,769
2010	3,555	227	3,782	0	3,782
2011	3,570	228	3,799	0	3,799
2012	3,582	229	3,811	0	3,811
2013	3,592	230	3,822	0	3,822
Annual Growth Rates (%)					
1980-1990	2.2	2.2	2.2		2.2
1990-2000	1.2	1.2	1.2		1.2
2000-2003	0.6	0.6	0.6		0.6
2003-2008	0.9	0.9	0.9		0.9
2008-2013	0.4	0.4	0.4		0.4
2003-2013	0.6	0.6	0.6		0.6

Table B-7
Staff's Outlook for the Other Area
Net Energy for Load (GWh)

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	2,677	343	3,020	0	3,020
1981	2,781	356	3,137	0	3,137
1982	2,660	341	3,001	0	3,001
1983	2,595	332	2,928	0	2,928
1984	2,722	348	3,071	0	3,071
1985	2,770	355	3,124	0	3,124
1986	2,758	353	3,111	0	3,111
1987	2,872	368	3,240	0	3,240
1988	3,055	391	3,446	0	3,446
1989	3,205	410	3,615	0	3,615
1990	3,310	424	3,733	0	3,733
1991	3,323	425	3,748	0	3,748
1992	3,513	450	3,963	0	3,963
1993	3,602	461	4,063	0	4,063
1994	3,758	481	4,239	0	4,239
1995	3,819	489	4,308	0	4,308
1996	3,983	510	4,493	0	4,493
1997	3,972	508	4,481	0	4,481
1998	3,911	501	4,412	0	4,412
1999	4,009	513	4,522	0	4,522
2000	4,227	541	4,768	0	4,768
2001	4,230	541	4,771	0	4,771
2002	4,196	537	4,734	0	4,734
2003	4,262	546	4,807	0	4,807
2004	4,381	561	4,942	0	4,942
2005	4,466	572	5,038	0	5,038
2006	4,580	586	5,167	0	5,167
2007	4,639	594	5,233	0	5,233
2008	4,740	607	5,347	0	5,347
2009	4,828	618	5,445	0	5,445
2010	4,979	637	5,617	0	5,617
2011	5,100	653	5,753	0	5,753
2012	5,257	673	5,930	0	5,930
2013	5,415	693	6,108	0	6,108

Annual Growth Rates (%)

1980-1990	2.1	2.1	2.1		2.1
1990-2000	2.5	2.5	2.5		2.5
2000-2003	0.3	0.3	0.3		0.3
2003-2008	2.2	2.2	2.2		2.2
2008-2013	2.7	2.7	2.7		2.7
2003-2013	2.4	2.4	2.4		2.4

Table B-8
Staff's Outlook for the DWR Area
Net Energy for Load (GWh)

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	3,354	127	3,481	0	3,481
1981	5,264	200	5,464	0	5,464
1982	5,192	197	5,389	0	5,389
1983	2,497	95	2,592	0	2,592
1984	3,349	127	3,476	0	3,476
1985	5,410	206	5,616	0	5,616
1986	5,031	191	5,222	0	5,222
1987	4,734	180	4,913	0	4,913
1988	5,928	225	6,154	0	6,154
1989	7,413	282	7,694	0	7,694
1990	8,171	311	8,482	0	8,482
1991	4,400	167	4,567	0	4,567
1992	4,088	155	4,243	0	4,243
1993	4,372	166	4,538	0	4,538
1994	4,946	188	5,133	0	5,133
1995	3,562	135	3,698	0	3,698
1996	5,146	196	5,342	0	5,342
1997	5,504	209	5,713	0	5,713
1998	3,421	130	3,551	0	3,551
1999	5,490	209	5,699	0	5,699
2000	5,490	209	5,699	0	5,699
2001	6,349	269	6,619	0	6,619
2002	7,889	335	8,224	0	8,224
2003	7,889	335	8,224	0	8,224
2004	7,889	335	8,224	0	8,224
2005	7,889	335	8,224	0	8,224
2006	7,889	335	8,224	0	8,224
2007	7,889	335	8,224	0	8,224
2008	7,889	335	8,224	0	8,224
2009	7,889	335	8,224	0	8,224
2010	7,889	335	8,224	0	8,224
2011	7,889	335	8,224	0	8,224
2012	7,889	335	8,224	0	8,224
2013	7,889	335	8,224	0	8,224
Annual Growth Rates (%)					
1980-1990	9.3	9.3	9.3		9.3
1990-2000	-3.9	-3.9	-3.9		-3.9
2000-2003	12.8	17.1	13.0		13.0
2003-2008	0.0	0.0	0.0		0.0
2008-2013	0.0	0.0	0.0		0.0
2003-2013	0.0	0.0	0.0		0.0

TABLE B-9
Staff's Outlook for the State
Net Energy for Load (GWh)

Year	Total Consumption	Net Losses	Gross Generation	Private Supply	Net Energy for Load
1980	166,976	14,369	181,345	920	180,425
1981	173,653	14,855	188,508	934	187,574
1982	169,483	14,488	183,971	1,231	182,740
1983	172,778	14,810	187,588	2,142	185,446
1984	185,561	15,840	201,401	2,460	198,941
1985	192,520	16,284	208,805	2,877	205,928
1986	193,153	16,235	209,388	3,844	205,544
1987	202,879	16,941	219,821	5,467	214,354
1988	213,036	17,558	230,595	7,665	222,930
1989	219,787	17,979	237,766	8,457	229,309
1990	228,038	18,582	246,620	8,784	237,836
1991	222,259	18,244	240,503	9,156	231,347
1992	226,987	18,658	245,645	9,149	236,495
1993	227,624	18,628	246,252	10,444	235,809
1994	230,098	18,680	248,778	11,136	237,642
1995	230,990	18,856	249,846	11,216	238,631
1996	239,636	19,390	259,026	12,462	246,564
1997	247,476	20,036	267,512	12,481	255,031
1998	244,503	19,926	264,429	11,598	252,830
1999	253,653	20,608	274,262	11,461	262,800
2000	263,599	21,453	285,052	11,135	273,917
2001	253,528	20,671	274,199	10,667	263,533
2002	253,667	20,521	274,188	12,000	262,189
2003	256,476	20,735	277,211	12,337	264,874
2004	262,252	21,210	283,462	12,443	271,019
2005	268,099	21,688	289,787	12,550	277,237
2006	273,329	22,115	295,444	12,658	282,786
2007	277,043	22,416	299,459	12,768	286,692
2008	281,773	22,807	304,580	12,878	291,702
2009	285,155	23,080	308,234	12,990	295,245
2010	288,931	23,393	312,325	13,102	299,222
2011	292,767	23,706	316,473	13,216	303,257
2012	296,582	24,015	320,597	13,331	307,266
2013	299,586	24,264	323,850	13,447	310,403
Annual Growth Rates (%)					
1980-1990	3.2	2.6	3.1	25.3	2.8
1990-2000	1.5	1.4	1.5	2.4	1.4
2000-2003	-0.9	-1.1	-0.9	3.5	-1.1
2003-2008	1.9	1.9	1.9	0.9	1.9
2008-2013	1.2	1.2	1.2	0.9	1.3
2003-2013	1.6	1.6	1.6	0.9	1.6

Table B-10
Staff's Outlook for the State
1 IN 2 Net Energy for Load by CAISO Congestion Zone with Municipal Sales and Direct Access
(GWh)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Growth Rate (%) 2001-2006	Growth Rate (%) 2001-2013
PG&E North	87,761	87,409	88,125	90,125	92,104	93,966	95,328	97,257	98,482	99,940	101,243	102,468	103,422	1.38	1.38
PG&E Direct Access	4,122	9,119	9,119	9,236	9,356	9,477	9,600	9,725	9,852	9,980	10,110	10,242	10,376	18.12	8.00
PG&E Sales	68,175	63,028	63,592	65,046	66,576	68,013	69,034	70,535	71,440	72,539	73,502	74,402	75,084	-0.05	0.81
Muni Sales	15,464	15,262	15,415	15,843	16,172	16,476	16,693	16,997	17,190	17,421	17,630	17,823	17,962	1.28	1.26
PG&E San Francisco	5,828	5,266	5,455	5,761	5,906	5,973	6,059	6,176	6,254	6,346	6,422	6,499	6,559	0.49	0.99
Dept of Water Resources - North	1,048	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	4.44	1.83
North of Path 15	94,637	93,977	94,882	97,188	99,312	101,241	102,689	104,735	106,038	107,587	108,967	110,269	111,283	1.36	1.36
Path 26 Pacific Gas & Electric - South	8,943	8,371	8,448	8,649	8,848	9,034	9,166	9,359	9,476	9,619	9,744	9,861	9,949	0.20	0.89
Path 26 - Dept of Water Resources	1,731	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	4.44	1.83
Total Path 26	10,674	10,522	10,599	10,800	10,999	11,185	11,317	11,510	11,628	11,770	11,895	12,012	12,100	0.94	1.05
Southern California Edison	93,006	90,859	91,805	94,315	97,036	99,371	100,883	102,591	103,922	105,320	106,936	108,578	109,714	1.33	1.39
SCE Sales	79,337	69,900	70,728	72,780	75,044	76,953	78,098	79,421	80,390	81,418	82,645	83,891	84,681	-0.61	0.54
Muni Sales	9,217	9,118	9,237	9,501	9,762	9,988	10,153	10,331	10,483	10,641	10,813	10,987	11,109	1.62	1.57
SCE Direct Access	4,451	11,842	11,841	12,033	12,230	12,429	12,632	12,839	13,048	13,262	13,479	13,700	13,924	22.80	9.97
Pasadena Water and Power Dept	1,193	1,217	1,231	1,249	1,264	1,276	1,280	1,285	1,290	1,295	1,300	1,305	1,308	1.36	0.77
San Diego Gas & Electric	18,701	19,080	19,292	19,753	20,218	20,690	21,068	21,595	21,960	22,291	22,645	23,058	23,349	2.04	1.87
SDG&E Sales	16,064	15,414	15,626	16,006	16,389	16,777	17,068	17,507	17,781	18,019	18,278	18,594	18,785	0.87	1.31
SDG&E Direct Access	2,638	3,666	3,666	3,746	3,829	3,913	4,000	4,088	4,179	4,272	4,367	4,464	4,564	8.21	4.67
Dept of Water Resources - South	3,839	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4.44	1.83
South of Path 15	116,739	115,928	117,099	120,087	123,289	126,108	128,002	130,242	131,943	133,676	135,652	137,712	139,141	1.56	1.47
Sacramento Municipal Utilities District	9,931	10,033	10,175	10,351	10,540	10,704	10,868	11,053	11,223	11,395	11,565	11,727	11,886	1.51	1.51
Los Angeles Department of Water and Power	24,487	24,656	24,946	25,252	25,630	25,930	26,122	26,345	26,489	26,689	26,927	27,110	27,370	1.15	0.93
Burbank Public Service Dept	1,117	1,140	1,153	1,170	1,184	1,195	1,199	1,204	1,209	1,213	1,218	1,222	1,225	1.36	0.77
Glendale Public Service Dept	1,175	1,199	1,212	1,230	1,245	1,257	1,261	1,266	1,270	1,275	1,280	1,285	1,288	1.36	0.77
Imperial Irrigation District	3,078	3,185	3,272	3,360	3,449	3,539	3,629	3,716	3,801	3,889	3,976	4,062	4,148	2.83	2.52
Far North & East Sierra	1,693	1,549	1,535	1,582	1,589	1,628	1,604	1,631	1,644	1,728	1,777	1,868	1,960	-0.79	1.23
Non ISO	41,482	41,762	42,294	42,944	43,637	44,253	44,683	45,214	45,637	46,189	46,743	47,274	47,879	1.30	1.20
Total CAISO	231,982	220,427	222,580	228,075	233,599	238,533	242,008	246,487	249,608	253,034	256,514	259,993	262,524	0.56	1.04
Total State	263,533	262,189	264,874	271,019	277,237	282,786	286,692	291,702	295,245	299,222	303,257	307,266	310,403	1.42	1.37

Table B-11
Staff's High Demand Scenario for the State
1 IN 2 Net Energy for Load by CAISO Congestion Zone with Municipal Sales and Direct Access
(GWh)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Growth Rate (%) 2001-2006	2001-2013
PG&E North Total	87,761	87,409	88,125	91,129	93,864	96,606	98,672	100,334	101,374	102,760	103,958	105,196	106,220	1.94	1.60
PG&E Direct Access	4,122	9,119	9,119	9,236	9,356	9,477	9,600	9,725	9,852	9,980	10,110	10,242	10,376	18.12	8.00
PG&E Sales	68,175	63,028	63,592	65,892	68,056	70,223	71,827	73,092	73,846	74,884	75,764	76,675	77,416	0.59	1.06
Muni Sales	15,464	15,262	15,415	16,001	16,452	16,906	17,244	17,516	17,676	17,896	18,084	18,278	18,428	1.80	1.47
PG&E San Francisco	5,828	5,266	5,455	5,804	5,965	6,092	6,220	6,316	6,383	6,469	6,539	6,616	6,680	0.89	1.14
Dept of Water Resources - North	1,048	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	4.44	1.83
North of Path 15	94,637	93,977	94,882	98,236	101,131	104,000	106,193	107,951	109,059	110,531	111,799	113,114	114,203	1.90	1.58
Path 26 Pacific Gas & Electric - South	8,943	8,371	8,448	8,756	9,036	9,316	9,524	9,688	9,786	9,920	10,034	10,153	10,248	0.82	1.14
Path 26 - Dept of Water Resources	1,731	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	4.44	1.83
Total Path 26	10,674	10,522	10,599	10,907	11,187	11,467	11,675	11,839	11,937	12,072	12,186	12,304	12,399	1.44	1.26
Southern California Edison	93,006	90,859	91,805	95,276	98,683	101,791	104,103	105,659	106,865	108,147	109,590	111,264	112,465	1.82	1.60
SCE Sales	79,337	69,900	70,728	73,667	76,565	79,185	81,066	82,247	83,102	84,021	85,089	86,365	87,215	-0.04	0.79
Muni Sales	9,217	9,118	9,237	9,575	9,888	10,177	10,405	10,574	10,715	10,864	11,022	11,199	11,326	2.00	1.73
SCE Direct Access	4,451	11,842	11,841	12,033	12,230	12,429	12,632	12,839	13,048	13,262	13,479	13,700	13,924	22.80	9.97
Pasadena Water and Power Dept	1,193	1,217	1,231	1,257	1,280	1,299	1,312	1,317	1,321	1,325	1,329	1,333	1,337	1.73	0.96
San Diego Gas & Electric	18,701	19,080	19,292	19,928	20,545	21,156	21,684	22,177	22,533	22,847	23,185	23,604	23,905	2.50	2.07
SDG&E Sales	16,064	15,414	15,626	16,182	16,716	17,242	17,685	18,089	18,354	18,575	18,819	19,140	19,342	1.43	1.56
SDG&E Direct Access	2,638	3,666	3,666	3,746	3,829	3,913	4,000	4,088	4,179	4,272	4,367	4,464	4,564	8.21	4.67
Dept of Water Resources - South	3,839	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4.44	1.83
South of Path 15	116,739	115,928	117,099	121,232	125,279	129,017	131,870	133,923	135,490	137,089	138,875	140,972	142,478	2.02	1.67
Sacramento Municipal Utilities District	9,931	10,033	10,175	10,432	10,683	10,909	11,128	11,297	11,466	11,632	11,799	11,966	12,132	1.90	1.68
Los Angeles Department of Water and Power	24,487	24,656	24,946	25,458	26,000	26,462	26,817	27,018	27,158	27,331	27,533	27,715	27,984	1.56	1.12
Burbank Public Service Dept	1,117	1,140	1,153	1,178	1,199	1,217	1,229	1,233	1,238	1,241	1,245	1,249	1,253	1.73	0.96
Glendale Public Service Dept	1,175	1,199	1,212	1,238	1,261	1,280	1,292	1,297	1,301	1,304	1,309	1,313	1,317	1.73	0.96
Imperial Irrigation District	3,078	3,185	3,272	3,360	3,449	3,539	3,629	3,716	3,801	3,889	3,976	4,062	4,148	2.83	2.52
Far North & East Sierra	1,693	1,549	1,535	1,618	1,664	1,707	1,745	1,757	1,759	1,801	1,850	1,942	2,035	0.16	1.55
Non CAISO	41,482	41,762	42,294	43,283	44,256	45,114	45,841	46,318	46,722	47,199	47,711	48,246	48,868	1.69	1.37
Total CAISO	231,982	230,459	232,755	240,807	248,280	255,393	260,866	265,011	267,951	271,324	274,658	278,356	281,211	1.94	1.62
Total State	263,533	262,189	264,874	273,658	281,853	289,598	295,579	300,032	303,207	306,890	310,571	314,636	317,948	1.90	1.58

TABLE B-12
Staff's Low Demand Scenario for the State
1 IN 2 Net Energy for Load by CAISO Congestion Zone with Municipal Sales and Direct Access
(GWh)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Growth Rate (%) 2001-2006	2003-2013
PG&E North Total	87,761	87,409	88,125	89,628	90,937	92,212	92,846	94,307	95,443	97,032	98,439	99,659	100,756	0.99	1.35
PG&E Direct Access	4,122	9,119	9,119	9,236	9,356	9,477	9,600	9,725	9,852	9,980	10,110	10,242	10,376	18.12	1.30
PG&E Sales	68,175	63,028	63,592	64,635	65,608	66,552	66,957	68,052	68,882	70,087	71,141	72,036	72,832	-0.48	1.37
Muni Sales	15,464	15,262	15,415	15,757	15,974	16,183	16,289	16,529	16,710	16,965	17,188	17,381	17,547	0.91	1.30
PG&E San Francisco	5,828	5,266	5,455	5,731	5,835	5,867	5,949	6,012	6,074	6,166	6,240	6,316	6,389	0.13	1.59
Dept of Water Resources - North	1,048	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	4.44	0.00
North of Path 15	94,637	93,977	94,882	96,661	98,074	99,381	100,097	101,621	102,819	104,499	105,981	107,278	108,447	0.98	1.35
Path 26 Pacific Gas & Electric - South	8,943	8,371	8,448	8,596	8,723	8,846	8,901	9,044	9,152	9,308	9,444	9,561	9,664	-0.22	1.35
Path 26 - Dept of Water Resources	1,731	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	4.44	0.00
Total Path 26	10,674	10,522	10,599	10,747	10,874	10,998	11,052	11,195	11,303	11,459	11,596	11,712	11,815	0.60	1.09
Southern California Edison	93,006	90,859	91,805	93,695	95,593	97,109	97,898	99,422	100,789	102,198	103,767	105,443	106,788	0.87	1.52
SCE Sales	79,337	69,900	70,728	72,210	73,717	74,869	75,346	76,494	77,494	78,528	79,712	80,989	81,971	-1.15	1.49
Muni Sales	9,217	9,118	9,237	9,452	9,646	9,810	9,919	10,089	10,247	10,408	10,577	10,754	10,892	1.25	1.66
SCE Direct Access	4,451	11,842	11,841	12,033	12,230	12,429	12,632	12,839	13,048	13,262	13,479	13,700	13,924	22.80	1.63
Pasadena Water and Power Dept	1,193	1,217	1,231	1,242	1,249	1,252	1,249	1,255	1,260	1,264	1,270	1,275	1,280	0.98	0.39
San Diego Gas & Electric	18,701	19,080	19,292	19,610	19,947	20,260	20,492	20,942	21,276	21,589	21,932	22,335	22,639	1.61	1.61
SDG&E Sales	16,064	15,414	15,626	15,863	16,118	16,347	16,493	16,853	17,097	17,318	17,565	17,871	18,075	0.35	1.47
SDG&E Direct Access	2,638	3,666	3,666	3,746	3,829	3,913	4,000	4,088	4,179	4,272	4,367	4,464	4,564	8.21	2.21
Dept of Water Resources - South	3,839	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4.44	0.00
South of Path 15	116,739	115,928	117,099	119,317	121,560	123,392	124,410	126,389	128,096	129,823	131,739	133,823	135,478	1.11	1.47
Sacramento Municipal Utilities District	9,931	10,033	10,175	10,319	10,456	10,562	10,661	10,812	10,980	11,149	11,317	11,478	11,641	1.24	1.35
Los Angeles Department of Water and Power	24,487	24,656	24,946	25,106	25,314	25,422	25,449	25,640	25,810	26,000	26,227	26,438	26,758	0.75	0.70
Burbank Public Service Dept	1,117	1,140	1,153	1,163	1,170	1,173	1,171	1,175	1,180	1,184	1,189	1,194	1,200	0.98	0.39
Glendale Public Service Dept	1,175	1,199	1,212	1,223	1,230	1,233	1,230	1,235	1,241	1,245	1,250	1,256	1,261	0.98	0.39
Imperial Irrigation District	3,078	3,185	3,272	3,360	3,449	3,539	3,629	3,716	3,801	3,889	3,976	4,062	4,148	2.83	2.40
Far North & East Sierra	1,693	1,549	1,535	1,555	1,546	1,527	1,504	1,521	1,504	1,512	1,522	1,528	1,530	-2.04	-0.03
Non CAISO	41,482	41,762	42,294	42,726	43,165	43,457	43,644	44,099	44,515	44,979	45,483	45,956	46,538	0.93	0.96
Total CAISO	231,982	220,427	222,580	226,726	230,508	233,770	235,559	239,205	242,218	245,781	249,316	252,813	255,739	0.15	1.40
Total State	263,533	262,189	264,874	269,452	273,673	277,227	279,204	283,304	286,733	290,760	294,799	298,769	302,277	1.02	1.33

TABLE D-1
Staff's Outlook for the PG&E Area
Peak Demand (MW)

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Peak Demand	Load Factor (%)
1990	16,203	1,525	17,728	478	17,250	60.1
1991	15,526	1,459	16,985	488	16,497	62.8
1992	15,544	1,462	17,006	473	16,533	63.7
1993	16,431	1,546	17,977	488	17,489	60.1
1994	16,408	1,518	17,926	753	17,173	61.3
1995	17,192	1,593	18,785	769	18,016	59.2
1996	18,189	1,687	19,876	799	19,077	57.1
1997	18,567	1,721	20,288	829	19,459	58.2
1998	19,537	1,813	21,350	841	20,509	54.9
1999	19,417	1,801	21,218	849	20,369	57.6
2000	19,658	1,824	21,482	854	20,628	58.7
2001	18,554	1,717	20,271	858	19,413	60.3
2002	19,563	1,811	21,374	890	20,484	56.3
2003	19,275	1,781	21,056	912	20,145	57.8
2004	19,756	1,827	21,583	921	20,662	57.8
2005	20,159	1,865	22,024	930	21,094	57.8
2006	20,517	1,899	22,416	939	21,477	57.9
2007	20,809	1,926	22,736	949	21,787	57.9
2008	21,201	1,964	23,164	958	22,206	58.0
2009	21,468	1,988	23,456	968	22,488	58.0
2010	21,777	2,018	23,795	977	22,817	58.0
2011	22,038	2,042	24,080	987	23,092	58.0
2012	22,300	2,066	24,366	997	23,369	58.0
2013	22,507	2,085	24,592	1,007	23,585	58.0

Annual Growth Rates (%)

1990-2000	2.0	1.8	1.9	6.0	1.8
2000-2001	-5.6	-5.9	-5.6	0.5	-5.9
2000-2003	-0.7	-0.8	-0.7	2.2	-0.8
2003-2008	1.9	2.0	1.9	1.0	2.0
2008-2013	1.2	1.2	1.2	1.0	1.2
2003-2013	1.6	1.6	1.6	1.0	1.6

Historic data through 2002

TABLE D-2
Staff's Outlook for the SMUD Area
Peak Demand (MW)

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Peak Demand	Load Factor (%)
1990	2,013	182	2,195	0	2,195	46.3
1991	1,987	179	2,166	0	2,166	46.8
1992	1,929	174	2,103	0	2,103	49.1
1993	1,968	178	2,146	0	2,146	47.7
1994	1,875	169	2,044	0	2,044	50.0
1995	2,039	184	2,223	0	2,223	46.2
1996	2,177	196	2,373	0	2,373	45.1
1997	2,240	202	2,442	0	2,442	44.8
1998	2,390	216	2,606	0	2,606	42.5
1999	2,531	228	2,759	0	2,759	41.1
2000	2,466	222	2,688	0	2,688	42.9
2001	2,279	206	2,485	0	2,485	45.6
2002	2,549	230	2,779	0	2,779	41.2
2003	2,437	220	2,657	0	2,657	43.7
2004	2,479	224	2,703	0	2,703	43.7
2005	2,524	228	2,752	0	2,752	43.7
2006	2,555	230	2,785	0	2,785	43.9
2007	2,587	233	2,821	0	2,821	44.0
2008	2,625	237	2,861	0	2,861	44.1
2009	2,661	240	2,901	0	2,901	44.2
2010	2,697	243	2,941	0	2,941	44.2
2011	2,733	247	2,979	0	2,979	44.3
2012	2,767	250	3,017	0	3,017	44.4
2013	2,802	253	3,055	0	3,055	44.4

Annual Growth Rates (%)

2000-2001	-7.6	-7.6	-7.6		-7.6
2000-2003	-0.4	-0.4	-0.4		-0.4
2003-2008	1.5	1.5	1.5		1.5
2008-2013	1.3	1.3	1.3		1.3
2003-2013	1.4	1.4	1.4		1.4

Historic data through 2002

TABLE D-3
Staff's Outlook for the SCE Area
Peak Demand (MW)

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Peak Demand	Load Factor (%)
1990	16,879	1,246	18,125	478	17,647	54.1
1991	16,017	1,180	17,197	488	16,709	56.1
1992	17,585	1,301	18,886	473	18,413	52.1
1993	15,799	1,164	16,963	488	16,475	57.3
1994	17,311	1,274	18,585	541	18,044	53.4
1995	16,860	1,239	18,099	551	17,548	55.0
1996	17,480	1,286	18,766	559	18,207	54.8
1997	18,338	1,350	19,688	570	19,118	53.8
1998	19,104	1,408	20,512	577	19,935	51.6
1999	18,356	1,351	19,707	585	19,122	55.5
2000	18,958	1,395	20,353	596	19,757	57.1
2001	17,227	1,264	18,491	601	17,890	59.3
2002	17,481	1,279	18,760	655	18,105	57.3
2003	18,439	1,350	19,790	672	19,118	54.8
2004	18,952	1,389	20,341	679	19,662	54.8
2005	19,455	1,426	20,881	686	20,196	54.8
2006	19,865	1,457	21,322	692	20,629	55.0
2007	20,123	1,476	21,599	699	20,900	55.1
2008	20,419	1,498	21,917	706	21,211	55.2
2009	20,659	1,516	22,175	713	21,462	55.3
2010	20,908	1,534	22,442	721	21,721	55.4
2011	21,195	1,555	22,750	728	22,022	55.4
2012	21,503	1,578	23,081	735	22,346	55.5
2013	21,707	1,593	23,300	742	22,558	55.5

Annual Growth Rates (%)

2000-2001	-9.1	-9.4	-9.1	0.8	-9.4
2000-2003	-0.9	-1.1	-0.9	4.1	-1.1
2003-2008	2.1	2.1	2.1	1.0	2.1
2008-2013	1.2	1.2	1.2	1.0	1.2
2003-2013	1.6	1.7	1.6	1.0	1.7

Historic data through 2002

TABLE D-4
Staff's Outlook for the LADWP Area
Peak Demand (MW)

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Peak Demand	Load Factor (%)
1990	4,920	0	4,920	117	4,803	56.5
1991	4,771	0	4,771	138	4,633	57.2
1992	4,957	0	4,957	151	4,806	56.5
1993	4,378	0	4,378	146	4,232	65.1
1994	4,716	0	4,716	191	4,525	58.1
1995	4,665	0	4,665	206	4,459	60.8
1996	4,814	0	4,814	209	4,605	59.7
1997	5,248	0	5,248	209	5,039	55.6
1998	5,259	0	5,259	209	5,050	54.9
1999	5,067	0	5,067	209	4,858	57.2
2000	4,986	538	5,524	180	5,344	53.7
2001	4,530	484	5,014	209	4,805	58.2
2002	4,624	495	5,119	209	4,910	57.3
2003	5,040	541	5,581	209	5,372	53.0
2004	5,088	546	5,635	209	5,426	53.1
2005	5,146	553	5,699	209	5,490	53.3
2006	5,185	557	5,742	209	5,533	53.5
2007	5,208	560	5,768	209	5,559	53.6
2008	5,234	563	5,797	209	5,588	53.8
2009	5,252	565	5,817	209	5,608	53.9
2010	5,276	568	5,843	209	5,634	54.1
2011	5,306	571	5,877	209	5,668	54.2
2012	5,328	573	5,902	209	5,693	54.4
2013	5,363	577	5,940	209	5,731	54.5

Annual Growth Rates (%)

2000-2001	-9.1	-10.1	-9.2	16.1	-10.1
2000-2003	0.4	0.2	0.3	5.1	0.2
2003-2008	0.8	0.8	0.8	0.0	0.8
2008-2013	0.5	0.5	0.5	0.0	0.5
2003-2013	0.6	0.6	0.6	0.0	0.6

Historic data through 2002

TABLE D-5
Staff's Outlook for the SDG&E Area
Peak Demand (MW)

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Peak Demand	Load Factor (%)
1990	2,780	0	2,780	0	2,780	63.0
1991	2,828	0	2,828	0	2,828	61.3
1992	3,076	0	3,076	0	3,076	60.0
1993	2,697	0	2,697	0	2,697	68.2
1994	3,107	0	3,107	0	3,107	60.5
1995	3,055	0	3,055	0	3,055	62.1
1996	3,105	0	3,105	0	3,105	63.2
1997	3,438	0	3,438	0	3,438	59.6
1998	3,695	0	3,695	0	3,695	57.1
1999	3,335	0	3,335	0	3,335	65.7
2000	3,230	310	3,540	0	3,540	63.6
2001	2,909	279	3,189	0	3,189	67.0
2002	3,325	312	3,638	71	3,567	61.1
2003	3,546	333	3,880	74	3,806	57.9
2004	3,626	341	3,967	75	3,893	57.9
2005	3,707	349	4,056	75	3,980	58.0
2006	3,785	356	4,141	76	4,065	58.1
2007	3,846	362	4,208	77	4,131	58.2
2008	3,931	370	4,301	78	4,223	58.4
2009	3,990	376	4,366	79	4,287	58.5
2010	4,043	381	4,423	79	4,344	58.6
2011	4,100	386	4,486	80	4,406	58.7
2012	4,167	392	4,559	81	4,478	58.8
2013	4,215	397	4,611	82	4,530	58.8

Annual Growth Rates (%)

2000-2001	-9.9	-9.9	-9.9		-9.9
2000-2003	3.2	2.4	3.1		2.4
2003-2008	2.1	2.1	2.1	1.0	2.1
2008-2013	1.4	1.4	1.4	1.0	1.4
2003-2013	1.7	1.8	1.7	1.0	1.8

Historic data through 2002

TABLE D-6
Staff's Outlook for the BGP Area
Peak Demand (MW)

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Peak Demand	Load Factor (%)
1990	773	39	812	0	812	44.1
1991	718	37	755	0	755	44.4
1992	767	39	806	0	806	44.2
1993	679	35	714	0	714	51.0
1994	760	39	799	0	799	45.6
1995	743	38	781	0	781	48.0
1996	749	38	787	0	787	48.6
1997	810	41	851	0	851	46.2
1998	848	43	891	0	891	44.9
1999	800	41	841	0	841	46.8
2000	785	40	825	0	825	48.9
2001	694	35	729	0	729	54.5
2002	746	38	784	0	784	51.8
2003	822	42	864	0	864	47.5
2004	831	42	874	0	874	47.7
2005	839	43	882	0	882	47.8
2006	843	43	887	0	887	48.0
2007	845	43	888	0	888	48.1
2008	845	43	888	0	888	48.3
2009	846	43	889	0	889	48.4
2010	848	43	891	0	891	48.4
2011	849	43	892	0	892	48.6
2012	850	43	893	0	893	48.7
2013	850	43	894	0	894	48.8

Annual Growth Rates (%)

2000-2001	-11.6	-11.6	-11.6		-11.6	
2000-2003	1.6	1.6	1.6		1.6	
2003-2008	0.6	0.6	0.6		0.6	
2008-2013	0.1	0.1	0.1		0.1	
2003-2013	0.3	0.3	0.3		0.3	

Historic data through 2002

TABLE D-7
Staff's Outlook for the Other Area
Peak Demand (MW)

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	Peak Demand	Load Factor (%)
1990	756	45	801	0	801	53.2
1991	759	46	804	0	804	53.2
1992	802	48	850	0	850	53.2
1993	822	49	872	0	872	53.2
1994	858	51	909	0	909	53.2
1995	872	52	924	0	924	53.2
1996	909	55	964	0	964	53.2
1997	907	54	961	0	961	53.2
1998	893	54	947	0	947	53.2
1999	915	55	970	0	970	53.2
2000	965	58	1,023	0	1,023	53.2
2001	966	58	1,024	0	1,024	53.2
2002	971	58	1,029	0	1,029	52.5
2003	990	59	1,049	0	1,049	52.3
2004	1,018	61	1,079	0	1,079	52.3
2005	1,041	62	1,103	0	1,103	52.1
2006	1,068	64	1,132	0	1,132	52.1
2007	1,083	65	1,148	0	1,148	52.1
2008	1,106	66	1,172	0	1,172	52.1
2009	1,129	68	1,197	0	1,197	52.0
2010	1,166	70	1,236	0	1,236	51.9
2011	1,196	72	1,268	0	1,268	51.8
2012	1,236	74	1,310	0	1,310	51.7
2013	1,278	77	1,354	0	1,354	51.5

Annual Growth Rates (%)

2000-2001	0.1	0.1	0.1		0.1	
2000-2003	0.8	0.8	0.8		0.8	
2003-2008	2.2	2.2	2.2		2.2	
2008-2013	2.9	2.9	2.9		2.9	
2003-2013	2.6	2.6	2.6		2.6	

Historic data through 2002

TABLE D-8
Staff's Outlook for the DWR Area
Peak Demand (MW)

Year	Total End Use Load	Losses	Coincident Peak Demand
1990	227	14	241
1991	375	22	397
1992	242	14	256
1993	208	12	220
1994	88	5	93
1995	236	14	250
1996	398	24	422
1997	237	14	251
1998	236	14	250
1999	236	14	250
2000	236	14	250
2001	124	7	131
2002	322	19	341
2003	322	19	341
2004	322	19	341
2005	322	19	341
2006	322	19	341
2007	322	19	341
2008	322	19	341
2009	322	19	341
2010	322	19	341
2011	322	19	341
2012	322	19	341
2013	322	19	341
Annual Growth Rates (%)			
1990-2000	0.4	0.4	0.4
2000-2003	10.9	10.9	10.9
2003-2008	0.0	0.0	0.0
2008-2013	0.0	0.0	0.0
2003-2013	0.0	0.0	0.0

Historic data through 2002

TABLE D-9
Staff's Outlook for California
Noncoincident Peak Demand (MW)

Year	Total End Use Load	Net Losses	Gross Generation	Private Supply	CED 2003 Peak Demand	Load Factor (%)
1990	44,550	3,822	48,372	1,141	47,231	57.5
1991	42,980	3,625	46,605	1,176	45,429	58.1
1992	44,902	3,783	48,685	1,168	47,517	56.8
1993	42,982	3,614	46,596	1,185	45,411	59.3
1994	45,122	3,737	48,858	1,550	47,308	57.3
1995	45,662	3,782	49,443	1,589	47,854	56.9
1996	47,821	4,039	51,860	1,620	50,240	56.0
1997	49,785	4,125	53,910	1,660	52,250	55.7
1998	51,961	4,439	56,400	1,679	54,721	52.7
1999	50,658	4,347	55,005	1,712	53,293	56.3
2000	51,283	4,397	55,679	1,688	53,991	57.9
2001	47,284	4,046	51,331	1,706	49,625	60.6
2002	49,582	4,243	53,824	1,824	52,000	57.6
2003	50,871	4,346	55,218	1,867	53,351	56.7
2004	52,073	4,450	56,523	1,883	54,639	56.6
2005	53,192	4,545	57,737	1,900	55,837	56.7
2006	54,139	4,626	58,766	1,917	56,849	56.8
2007	54,823	4,685	59,508	1,934	57,574	56.8
2008	55,682	4,760	60,442	1,951	58,491	56.9
2009	56,328	4,815	61,143	1,969	59,174	57.0
2010	57,037	4,876	61,913	1,986	59,926	57.0
2011	57,739	4,935	62,674	2,004	60,670	57.1
2012	58,472	4,997	63,469	2,022	61,447	57.1
2013	59,043	5,045	64,088	2,040	62,048	57.1
						57

Annual Growth Rates (%)

1990-2000	1.4	1.4	1.4	4.0	1.3	0.1
2000-2001	-7.8	-8.0	-7.8	1.1	-8.1	4.7
2000-2003	-0.3	-0.4	-0.3	3.4	-0.4	-0.7
2003-2008	1.8	1.8	1.8	0.9	1.9	0.1
2008-2013	1.2	1.2	1.2	0.9	1.2	0.1
2003-2013	1.5	1.5	1.5	0.9	1.5	0.1

Historic data through 2002

TABLE D-10
Staff's Baseline Outlook for the State
1 IN 2 Electric Peak Demand by ISO Congestion Zone with Municipal Sales
(MW)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Growth Rate (%) 2001-2006	Growth Rate (%) 2001-2013
PG&E North	16,653	17,706	17,371	17,792	18,160	18,496	18,763	19,124	19,367	19,650	19,887	20,125	20,311	2.12	1.67
PG&E Sales	13,719	14,615	14,332	14,664	14,971	15,253	15,477	15,782	15,986	16,225	16,424	16,625	16,784	2.14	1.69
Muni Sales	2,934	3,092	3,038	3,128	3,189	3,243	3,286	3,342	3,381	3,425	3,463	3,501	3,528	2.02	1.55
PG&E San Francisco	979	885	917	968	992	1,004	1,018	1,038	1,051	1,066	1,079	1,092	1,102	0.49	0.99
Dept of Water Resources - North	21	54	54	54	54	54	54	54	54	54	54	54	54	21.00	8.27
North of Path 15	17,653	18,645	18,341	18,814	19,206	19,553	19,835	20,215	20,472	20,770	21,020	21,271	21,467	2.07	1.64
Path 26 Pacific Gas & Electric - South	1,781	1,893	1,857	1,902	1,942	1,978	2,006	2,045	2,071	2,101	2,126	2,152	2,172	2.12	1.67
Path 26 - Dept of Water Resources	34	89	89	89	89	89	89	89	89	89	89	89	89	21.00	8.27
Total Path 26	1,815	1,982	1,947	1,992	2,031	2,067	2,095	2,134	2,160	2,190	2,216	2,241	2,261	2.63	1.85
Southern California Edison	17,890	18,105	19,118	19,662	20,196	20,629	20,900	21,211	21,462	21,721	22,022	22,346	22,558	2.89	1.95
SCE Sales	16,117	16,288	17,194	17,682	18,164	18,556	18,796	19,075	19,297	19,527	19,796	20,085	20,274	2.86	1.93
Muni Sales	1,773	1,817	1,923	1,981	2,032	2,074	2,103	2,136	2,165	2,194	2,227	2,261	2,284	3.18	2.13
Pasadena Water and Power Dept	257	277	305	308	311	313	313	313	314	314	315	315	315	3.98	1.71
San Diego Gas & Electric	3,147	3,567	3,806	3,893	3,980	4,065	4,131	4,223	4,287	4,344	4,406	4,478	4,530	5.25	3.08
Dept of Water Resources - South	76	198	198	198	198	198	198	198	198	198	198	198	198	21.00	8.27
South of Path 15	21,371	22,147	23,426	24,061	24,685	25,204	25,542	25,945	26,261	26,578	26,941	27,337	27,600	3.36	2.15
Sacramento Municipal Utilities District	2,485	2,779	2,657	2,703	2,752	2,785	2,821	2,861	2,901	2,941	2,979	3,017	3,055	2.31	1.73
Los Angeles Department of Water and Power	4,805	4,910	5,372	5,426	5,490	5,533	5,559	5,588	5,608	5,634	5,668	5,693	5,731	2.86	1.48
Burbank Public Service Dept	232	249	275	278	280	282	282	282	283	283	284	284	284	3.98	1.71
Glendale Public Service Dept	240	258	285	288	290	292	292	293	293	294	294	294	294	3.98	1.71
Imperial Irrigation District	725	750	770	791	812	833	854	875	895	915	936	956	976	2.82	2.51
Far North & East Sierra	299	279	279	288	291	299	294	297	302	321	332	354	378	0.02	1.99
Non ISO	8,786	9,226	9,637	9,773	9,915	10,024	10,102	10,196	10,282	10,388	10,493	10,598	10,719	2.67	1.67
Total ISO	43,324	42,774	43,714	44,866	45,922	46,824	47,472	48,295	48,892	49,538	50,177	50,849	51,329	1.57	1.42
Total State	49,625	52,000	53,351	54,639	55,837	56,849	57,574	58,491	59,174	59,926	60,670	61,447	62,048	2.76	1.88
														0.55	1.34
Coincident Demand															
Total ISO Coincident Demand	42,286	41,750	42,667	43,792	44,822	45,703	46,335	47,138	47,721	48,352	48,975	49,631	50,100	1.57	1.42
Total Statewide Coincident Demand	48,436	50,755	52,073	53,331	54,500	55,487	56,195	57,090	57,757	58,491	59,217	59,975	60,562	2.76	1.88

Historic data through 2002
SMUD is included in ISO total through 2001.

TABLE D-11
Staff's Outlook for the State
1 IN 5 Electric Peak Demand by CAISO Congestion Zone
(MW)

														Growth Rate (%)	
Noncoincident Demand	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2001-2006	2001-2013
PG&E North	16,653	17,706	18,030	18,460	18,846	19,200	19,483	19,863	20,120	20,407	20,653	20,900	21,094	2.89	1.99
PG&E San Francisco	979	885	952	1,014	1,034	1,040	1,049	1,064	1,072	1,096	1,109	1,122	1,133	1.21	1.22
Dept of Water Resources - North	21	54	54	54	54	54	54	54	54	54	54	54	54	21.00	8.27
North of Path 15	17,653	18,645	19,036	19,527	19,934	20,294	20,586	20,981	21,246	21,557	21,816	22,077	22,280	2.83	1.96
Path 26 - Pacific Gas & Electric - South	1,781	1,893	1,928	1,974	2,015	2,053	2,083	2,124	2,151	2,182	2,208	2,235	2,255	2.89	1.99
Path 26 - Dept of Water Resources	34	89	89	89	89	89	89	89	89	89	89	89	89	21.00	8.27
Total Path 26	1,815	1,982	2,017	2,063	2,104	2,142	2,172	2,213	2,240	2,271	2,297	2,324	2,345	3.37	2.16
Southern California Edison	17,890	18,105	19,748	20,311	20,862	21,310	21,590	21,911	22,170	22,438	22,749	23,083	23,302	3.56	2.23
Pasadena Water and Power Dept	257	277	320	323	326	328	328	329	329	330	330	331	331	4.98	2.11
San Diego Gas & Electric	3,147	3,567	3,929	4,019	4,109	4,196	4,265	4,360	4,426	4,485	4,549	4,623	4,677	5.92	3.36
Dept of Water Resources - South	76	198	198	198	198	198	198	198	198	198	198	198	198	21.00	8.27
South of Path 15	21,371	22,147	24,195	24,851	25,496	26,032	26,381	26,798	27,123	27,451	27,826	28,235	28,507	4.03	2.43
Sacramento Municipal Utilities District	2,485	2,779	2,758	2,806	2,856	2,891	2,928	2,970	3,012	3,052	3,093	3,131	3,171	3.07	2.05
Los Angeles Department of Water and Power	4,805	4,910	5,635	5,692	5,759	5,804	5,831	5,861	5,883	5,911	5,946	5,972	6,012	3.85	1.89
Burbank Public Service Dept	232	249	288	291	294	296	296	296	297	297	298	298	298	4.98	2.11
Glendale Public Service Dept	240	258	299	302	305	306	307	307	307	308	308	309	309	4.98	2.11
Imperial Irrigation District	725	750	792	814	836	857	879	900	921	942	963	984	1,004	3.41	2.75
Far North & East Sierra	299	279	257	265	268	275	269	272	276	294	305	326	350	-1.66	1.33
Non ISO	8,786	9,226	10,029	10,169	10,317	10,429	10,510	10,607	10,695	10,804	10,912	11,019	11,144	3.49	2.00
Total CAISO Noncoincident Demand	43,324	42,774	45,249	46,441	47,534	48,469	49,139	49,991	50,610	51,279	51,940	52,636	53,132	2.27	1.72
Total State	49,625	52,000	55,277	56,611	57,851	58,898	59,649	60,598	61,305	62,083	62,852	63,655	64,276	3.49	2.18
Coincident Demand															
Total CAISO Coincident Demand	42,286	41,750	44,165	45,329	46,396	47,308	47,962	48,794	49,398	50,051	50,696	51,375	51,860	2.27	1.72
Total Statewide Coincident Demand	48,436	50,755	53,953	55,255	56,466	57,488	58,220	59,147	59,837	60,596	61,347	62,131	62,737	3.49	2.18

Historic data through 2002
SMUD is included in ISO total through 2001.

TABLE D-12
Staff's Baseline Outlook for the State
1 IN 10 Electric Peak Demand by CAISO Congestion Zone
(MW)

																Growth Rate (%)	
Noncoincident Demand	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2001-2006	2001-2013
PG&E North	17,569	17,779	16,653	17,706	18,580	19,030	19,424	19,783	20,069	20,455	20,715	21,018	21,272	21,526	21,725	3.50	2.24
PG&E San Francisco	921	948	979	885	927	979	1,004	1,015	1,030	1,050	1,063	1,079	1,092	1,105	1,115	0.72	1.09
Dept of Water Resources - North	40	40	21	54	54	54	54	54	54	54	54	54	54	54	54	21.00	8.27
North of Path 15	18,530	18,767	17,653	18,645	19,561	20,064	20,482	20,853	21,153	21,559	21,832	22,151	22,417	22,685	22,894	3.39	2.19
Path 26 - Pacific Gas & Electric - South	1,879	1,901	1,781	1,893	1,987	2,035	2,077	2,115	2,146	2,187	2,215	2,247	2,274	2,302	2,323	3.50	2.24
Path 26 - Dept of Water Resources	65	65	34	89	89	89	89	89	89	89	89	89	89	89	89	21.00	8.27
Total Path 26	1,944	1,966	1,815	1,982	2,076	2,124	2,166	2,204	2,235	2,276	2,304	2,337	2,364	2,391	2,412	3.97	2.40
Southern California Edison	19,122	19,757	17,890	18,105	20,274	20,852	21,417	21,877	22,164	22,494	22,760	23,035	23,355	23,698	23,923	4.11	2.45
Pasadena Water and Power Dept	294	291	257	277	323	326	329	331	332	332	332	333	333	334	334	5.18	2.19
San Diego Gas & Electric	3,574	3,476	3,147	3,567	3,996	4,087	4,179	4,268	4,338	4,434	4,501	4,561	4,626	4,702	4,756	6.28	3.50
Dept of Water Resources - South	145	145	76	198	198	198	198	198	198	198	198	198	198	198	198	21.00	8.27
South of Path 15	23,135	23,669	21,371	22,147	24,791	25,463	26,124	26,674	27,031	27,458	27,792	28,127	28,512	28,931	29,210	4.53	2.64
Sacramento Municipal Utilities District	2,759	2,688	2,485	2,779	2,835	2,884	2,936	2,972	3,010	3,053	3,096	3,138	3,179	3,219	3,259	3.64	2.29
Los Angeles Department of Water and Power	5,407	5,344	4,805	4,910	5,689	5,746	5,813	5,860	5,887	5,917	5,939	5,967	6,002	6,029	6,069	4.05	1.97
Burbank Public Service Dept	268	262	232	249	291	294	297	298	299	299	299	300	300	301	301	5.18	2.19
Glendale Public Service Dept	279	272	240	258	301	305	308	309	310	310	310	311	311	312	312	5.18	2.19
Imperial Irrigation District	728	705	725	750	815	837	860	882	904	926	947	969	991	1,012	1,033	3.99	3.00
Far North & East Sierra	242	318	299	279	234	242	244	250	244	246	249	267	277	298	321	-3.48	0.61
Non ISO	9,683	9,589	8,786	9,226	10,165	10,308	10,457	10,571	10,653	10,751	10,841	10,952	11,061	11,170	11,296	3.77	2.12
Total CAISO Noncoincident Demand	46,369	45,124	43,324	42,774	46,428	47,651	48,772	49,731	50,419	51,293	51,928	52,615	53,293	54,007	54,517	2.80	1.93
Total State	53,293	53,991	49,625	52,000	56,593	57,958	59,229	60,302	61,072	62,044	62,769	63,566	64,354	65,177	65,812	3.97	2.38
Coincident Demand																	
Total CAISO Coincident Demand	45,258	44,043	42,286	41,750	45,316	46,510	47,604	48,540	49,212	50,065	50,685	51,355	52,017	52,714	53,211	2.80	1.93
Total Statewide Coincident Demand	52,016	52,699	48,436	50,755	55,238	56,571	57,811	58,858	59,609	60,559	61,266	62,044	62,813	63,616	64,236	3.97	2.38

Historic data through 2002
SMUD is included in ISO total through 2001.

TABLE D-13
Staff's Outlook for the State
1 IN 40 Electric Peak Demand by CAISO Congestion Zone
(MW)

																Growth Rate (%)	
Noncoincident Demand	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2001-2006	2001-2013
PG&E North	17,569	19,555	18,312	19,463	19,088	19,543	19,952	20,327	20,626	21,028	21,301	21,604	21,864	22,127	22,331	2.11	1.67
PG&E San Francisco	921	962	1,001	912	952	1,014	1,034	1,040	1,049	1,064	1,072	1,096	1,109	1,122	1,133	0.77	1.04
Dept of Water Resources - North	40	40	21	54	54	54	54	54	54	54	54	54	54	54	54	21.00	8.27
North of Path 15	18,530	20,557	19,334	20,429	20,094	20,611	21,041	21,421	21,730	22,146	22,427	22,754	23,027	23,303	23,518	2.07	1.65
Path 26 - Pacific Gas & Electric - South	1,879	2,091	1,958	2,081	2,041	2,090	2,133	2,173	2,205	2,248	2,278	2,310	2,338	2,366	2,388	2.11	1.67
Path 26 - Dept of Water Resources	65	65	34	89	89	89	89	89	89	89	89	89	89	89	89	21.00	8.27
Total Path 26	1,944	2,156	1,992	2,170	2,130	2,179	2,223	2,263	2,295	2,338	2,367	2,399	2,427	2,455	2,477	2.58	1.83
Southern California Edison	19,122	21,496	19,464	19,699	20,800	21,392	21,973	22,445	22,739	23,077	23,351	23,633	23,960	24,312	24,543	2.89	1.95
Pasadena Water and Power Dept	294	311	275	296	326	329	332	334	335	335	335	336	336	337	337	3.98	1.71
San Diego Gas & Electric	3,574	3,686	3,337	3,783	4,036	4,128	4,221	4,310	4,381	4,479	4,546	4,607	4,673	4,749	4,803	5.25	3.08
Dept of Water Resources - South	145	145	76	198	198	198	198	198	198	198	198	198	198	198	198	21.00	8.27
South of Path 15	23,135	25,638	23,153	23,975	25,359	26,048	26,724	27,287	27,652	28,089	28,430	28,773	29,167	29,596	29,881	3.34	2.15
Sacramento Municipal Utilities District	2,759	2,946	2,724	3,046	2,912	2,962	3,016	3,053	3,091	3,136	3,180	3,223	3,265	3,306	3,348	2.31	1.73
Los Angeles Department of Water and Power	5,407	5,713	5,137	5,249	5,743	5,800	5,868	5,915	5,943	5,973	5,995	6,023	6,059	6,086	6,127	2.86	1.48
Burbank Public Service Dept	268	280	248	266	294	297	300	301	302	302	302	303	303	304	304	3.98	1.71
Glendale Public Service Dept	279	291	257	276	304	308	311	312	313	313	313	314	314	315	315	3.98	1.71
Imperial Irrigation District	728	767	789	816	838	861	883	906	929	952	974	996	1,018	1,040	1,062	2.82	2.51
Far North & East Sierra	242	256	235	213	211	218	220	226	218	220	223	241	250	270	292	-0.80	1.85
Non ISO	9,683	10,253	9,389	9,866	10,301	10,446	10,598	10,713	10,796	10,896	10,987	11,099	11,210	11,320	11,447	2.67	1.67
Total CAISO Noncoincident Demand	46,369	49,141	47,203	46,574	47,584	48,837	49,987	50,971	51,677	52,573	53,224	53,927	54,622	55,354	55,876	1.55	1.42
Total State	53,293	58,604	53,868	56,440	57,885	59,284	60,585	61,684	62,472	63,468	64,211	65,026	65,831	66,673	67,323	2.75	1.88
Coincident Demand																	
Total CAISO Coincident Demand	45,258	47,964	46,072	45,459	46,444	47,668	48,790	49,750	50,439	51,314	51,949	52,635	53,314	54,028	54,538	1.55	1.42
Total Statewide Coincident Demand	52,016	57,201	52,578	55,089	56,499	57,864	59,134	60,207	60,976	61,949	62,673	63,468	64,255	65,077	65,711	2.75	1.88

Historic data through 2002
SMUD is included in ISO total through 2001.

TABLE B-10
Staff's Baseline Outlook for the State
1 IN 2 Net Energy for Load by CAISO Congestion Zone with Municipal Sales and Direct Access
(GWh)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Growth Rate (%) 2001-2006	Growth Rate (%) 2001-2013
PG&E North	87,761	87,409	88,125	90,125	92,104	93,966	95,328	97,257	98,482	99,940	101,243	102,468	103,422	1.38	1.38
PG&E Direct Access	4,122	9,119	9,119	9,236	9,356	9,477	9,600	9,725	9,852	9,980	10,110	10,242	10,376	18.12	8.00
PG&E Sales	68,175	63,028	63,592	65,046	66,576	68,013	69,034	70,535	71,440	72,539	73,502	74,402	75,084	-0.05	0.81
Muni Sales	15,464	15,262	15,415	15,843	16,172	16,476	16,693	16,997	17,190	17,421	17,630	17,823	17,962	1.28	1.26
PG&E San Francisco	5,828	5,266	5,455	5,761	5,906	5,973	6,059	6,176	6,254	6,346	6,422	6,499	6,559	0.49	0.99
Dept of Water Resources - North	1,048	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	4.44	1.83
North of Path 15	94,637	93,977	94,882	97,188	99,312	101,241	102,689	104,735	106,038	107,587	108,967	110,269	111,283	1.36	1.36
Path 26 Pacific Gas & Electric - South	8,943	8,371	8,448	8,649	8,848	9,034	9,166	9,359	9,476	9,619	9,744	9,861	9,949	0.20	0.89
Path 26 - Dept of Water Resources	1,731	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	4.44	1.83
Total Path 26	10,674	10,522	10,599	10,800	10,999	11,185	11,317	11,510	11,628	11,770	11,895	12,012	12,100	0.94	1.05
Southern California Edison	93,006	90,859	91,805	94,315	97,036	99,371	100,883	102,591	103,922	105,320	106,936	108,578	109,714	1.33	1.39
SCE Sales	79,337	69,900	70,728	72,780	75,044	76,953	78,098	79,421	80,390	81,418	82,645	83,891	84,681	-0.61	0.54
Muni Sales	9,217	9,118	9,237	9,501	9,762	9,988	10,153	10,331	10,483	10,641	10,813	10,987	11,109	1.62	1.57
SCE Direct Access	4,451	11,842	11,841	12,033	12,230	12,429	12,632	12,839	13,048	13,262	13,479	13,700	13,924	22.80	9.97
Pasadena Water and Power Dept	1,193	1,217	1,231	1,249	1,264	1,276	1,280	1,285	1,290	1,295	1,300	1,305	1,308	1.36	0.77
San Diego Gas & Electric	18,701	19,080	19,292	19,753	20,218	20,690	21,068	21,595	21,960	22,291	22,645	23,058	23,349	2.04	1.87
SDG&E Sales	16,064	15,414	15,626	16,006	16,389	16,777	17,068	17,507	17,781	18,019	18,278	18,594	18,785	0.87	1.31
SDG&E Direct Access	2,638	3,666	3,666	3,746	3,829	3,913	4,000	4,088	4,179	4,272	4,367	4,464	4,564	8.21	4.67
Dept of Water Resources - South	3,839	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4.44	1.83
South of Path 15	116,739	115,928	117,099	120,087	123,289	126,108	128,002	130,242	131,943	133,676	135,652	137,712	139,141	1.56	1.47
Sacramento Municipal Utilities District	9,931	10,033	10,175	10,351	10,540	10,704	10,868	11,053	11,223	11,395	11,565	11,727	11,886	1.51	1.51
Los Angeles Department of Water and Power	24,487	24,656	24,946	25,252	25,630	25,930	26,122	26,345	26,489	26,689	26,927	27,110	27,370	1.15	0.93
Burbank Public Service Dept	1,117	1,140	1,153	1,170	1,184	1,195	1,199	1,204	1,209	1,213	1,218	1,222	1,225	1.36	0.77
Glendale Public Service Dept	1,175	1,199	1,212	1,230	1,245	1,257	1,261	1,266	1,270	1,275	1,280	1,285	1,288	1.36	0.77
Imperial Irrigation District	3,078	3,185	3,272	3,360	3,449	3,539	3,629	3,716	3,801	3,889	3,976	4,062	4,148	2.83	2.52
Far North & East Sierra	1,693	1,549	1,535	1,582	1,589	1,628	1,604	1,631	1,644	1,728	1,777	1,868	1,960	-0.79	1.23
Non ISO	41,482	41,762	42,294	42,944	43,637	44,253	44,683	45,214	45,637	46,189	46,743	47,274	47,879	1.30	1.20
Total CAISO	231,982	220,427	222,580	228,075	233,599	238,533	242,008	246,487	249,608	253,034	256,514	259,993	262,524	0.56	1.04
Total State	263,533	262,189	264,874	271,019	277,237	282,786	286,692	291,702	295,245	299,222	303,257	307,266	310,403	1.42	1.37

Historic data through 2002
SMUD is included in ISO total through 2001.

Table B-10
Staff's Outlook for the State
1 IN 2 Net Energy for Load by CAISO Congestion Zone with Municipal Sales and Direct Access
(GWh)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Growth Rate (%) 2001-2006	Growth Rate (%) 2001-2013
PG&E North	88,737	91,657	87,761	87,409	88,125	90,125	92,104	93,966	95,328	97,257	98,482	99,940	101,243	102,468	103,422	1.38	1.38
PG&E Direct Access	8,722	9,202	4,122	9,119	9,119	9,236	9,356	9,477	9,600	9,725	9,852	9,980	10,110	10,242	10,376	18.12	8.00
PG&E Sales	64,053	65,972	68,175	63,028	63,592	65,046	66,576	68,013	69,034	70,535	71,440	72,539	73,502	74,402	75,084	-0.05	0.81
Muni Sales	15,962	16,483	15,464	15,262	15,415	15,843	16,172	16,476	16,693	16,997	17,190	17,421	17,630	17,823	17,962	1.28	1.26
PG&E San Francisco	5,483	5,644	5,828	5,266	5,455	5,761	5,906	5,973	6,059	6,176	6,254	6,346	6,422	6,499	6,559	0.49	0.99
Dept of Water Resources - North	902	902	1,048	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	1,302	4.44	1.83
North of Path 15	95,122	98,203	94,637	93,977	94,882	97,188	99,312	101,241	102,689	104,735	106,038	107,587	108,967	110,269	111,283	1.36	1.36
Path 26 Pacific Gas & Electric - South	8,555	8,816	8,943	8,371	8,448	8,649	8,848	9,034	9,166	9,359	9,476	9,619	9,744	9,861	9,949	0.20	0.89
Path 26 - Dept of Water Resources	1,491	1,491	1,731	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	2,151	4.44	1.83
Total Path 26	10,046	10,307	10,674	10,522	10,599	10,800	10,999	11,185	11,317	11,510	11,628	11,770	11,895	12,012	12,100	0.94	1.05
Southern California Edison	92,904	98,835	93,006	90,859	91,805	94,315	97,036	99,371	100,883	102,591	103,922	105,320	106,936	108,578	109,714	1.33	1.39
SCE Sales	74,106	79,171	79,337	69,900	70,728	72,780	75,044	76,953	78,098	79,421	80,390	81,418	82,645	83,891	84,681	-0.61	0.54
Muni Sales	9,379	9,727	9,217	9,118	9,237	9,501	9,762	9,988	10,153	10,331	10,483	10,641	10,813	10,987	11,109	1.62	1.57
SCE Direct Access	9,419	9,937	4,451	11,842	11,841	12,033	12,230	12,429	12,632	12,839	13,048	13,262	13,479	13,700	13,924	22.80	9.97
Pasadena Water and Power Dept	1,205	1,246	1,193	1,217	1,231	1,249	1,264	1,276	1,280	1,285	1,290	1,295	1,300	1,305	1,308	1.36	0.77
San Diego Gas & Electric	19,202	19,731	18,701	19,080	19,292	19,753	20,218	20,690	21,068	21,595	21,960	22,291	22,645	23,058	23,349	2.04	1.87
SDG&E Sales	13,621	13,842	16,064	15,414	15,626	16,006	16,389	16,777	17,068	17,507	17,781	18,019	18,278	18,594	18,785	0.87	1.31
SDG&E Direct Access	5,581	5,888	2,638	3,666	3,666	3,746	3,829	3,913	4,000	4,088	4,179	4,272	4,367	4,464	4,564	8.21	4.67
Dept of Water Resources - South	3,306	3,306	3,839	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4,771	4.44	1.83
South of Path 15	116,617	123,118	116,739	115,928	117,099	120,087	123,289	126,108	128,002	130,242	131,943	133,676	135,652	137,712	139,141	1.56	1.47
Sacramento Municipal Utilities District	9,923	10,098	9,931	10,033	10,175	10,351	10,540	10,704	10,868	11,053	11,223	11,395	11,565	11,727	11,886	1.51	1.51
Los Angeles Department of Water and Power	24,328	25,136	24,487	24,656	24,946	25,252	25,630	25,930	26,122	26,345	26,489	26,689	26,927	27,110	27,370	1.15	0.93
Burbank Public Service Dept	1,098	1,123	1,117	1,140	1,153	1,170	1,184	1,195	1,199	1,204	1,209	1,213	1,218	1,222	1,225	1.36	0.77
Glendale Public Service Dept	1,143	1,164	1,175	1,199	1,212	1,230	1,245	1,257	1,261	1,266	1,270	1,275	1,280	1,285	1,288	1.36	0.77
Imperial Irrigation District	2,845	2,841	3,078	3,185	3,272	3,360	3,449	3,539	3,629	3,716	3,801	3,889	3,976	4,062	4,148	2.83	2.52
Far North & East Sierra	1,678	1,928	1,693	1,549	1,535	1,582	1,589	1,628	1,604	1,631	1,644	1,728	1,777	1,868	1,960	-0.79	1.23
Non ISO	41,015	42,289	41,482	41,762	42,294	42,944	43,637	44,253	44,683	45,214	45,637	46,189	46,743	47,274	47,879	1.30	1.20
Total CAISO	231,708	241,726	231,982	220,427	222,580	228,075	233,599	238,533	242,008	246,487	249,608	253,034	256,514	259,993	262,524	0.56	1.04
Total State	262,800	273,917	263,533	262,189	264,874	271,019	277,237	282,786	286,692	291,702	295,245	299,222	303,257	307,266	310,403	1.42	1.37

SMUD is included in ISO total through 2001.

Planning Area Totals	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Growth Rate (%) 2001-2006	Growth Rate (%) 2001-2013
PG&E	102,775	106,117	102,532	101,046	102,027	104,535	106,858	108,973	110,553	112,792	114,212	115,904	117,409	118,828	119,930	0.14	1.02
SMUD	9,923	10,098	9,931	10,033	10,175	10,351	10,540	10,704	10,868	11,053	11,223	11,395	11,565	11,727	11,886	0.86	1.37
SCE	92,904	98,835	93,006	90,859	91,805	94,315	97,036	99,371	100,883	102,591	103,922	105,320	106,936	108,578	109,714	-0.37	0.87
LADWP	24,328	25,136	24,487	24,656	24,946	25,252	25,630	25,930	26,122	26,345	26,489	26,689	26,927	27,110	27,370	0.39	0.71
BGP	3,447	3,533	3,485	3,557	3,597	3,648	3,693	3,728	3,741	3,755	3,769	3,782	3,799	3,811	3,822	0.89	0.66
SDG&E	19,202	19,731	18,701	19,080	19,292	19,753	20,218	20,690	21,068	21,595	21,960	22,291	22,645	23,058	23,349	0.49	1.41
Other	4,522	4,768	4,771	4,734	4,807	4,942	5,038	5,167	5,233	5,347	5,445	5,617	5,753	5,930	6,108	1.11	2.09
DWR	5,699	5,699	6,619	8,224	8,224	8,224	8,224	8,224	8,224	8,224	8,224	8,224	8,224	8,224	8,224	7.61	3.10
Total	262,800	273,917	263,533	262,189	264,874	271,019	277,237	282,786	286,692	291,702	295,245	299,222	303,257	307,266	310,403	0.24	1.05

Source: Appendix B, CALIFORNIA ENERGY DEMAND 2003-2013 FORECAST, August 2003

TABLE D-10
Staff's Baseline Outlook for the State
1 IN 2 Electric Peak Demand by ISO Congestion Zone with Municipal Sales
(MW)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Growth Rate (%) 2001-2006	Growth Rate (%) 2001-2013
PG&E North	16,653	17,706	17,371	17,792	18,160	18,496	18,763	19,124	19,367	19,650	19,887	20,125	20,311	2.12	1.67
PG&E Sales	13,719	14,615	14,332	14,664	14,971	15,253	15,477	15,782	15,986	16,225	16,424	16,625	16,784	2.14	1.69
Muni Sales	2,934	3,092	3,038	3,128	3,189	3,243	3,286	3,342	3,381	3,425	3,463	3,501	3,528	2.02	1.55
PG&E San Francisco	979	885	917	968	992	1,004	1,018	1,038	1,051	1,066	1,079	1,092	1,102	0.49	0.99
Dept of Water Resources - North	21	54	54	54	54	54	54	54	54	54	54	54	54	21.00	8.27
North of Path 15	17,653	18,645	18,341	18,814	19,206	19,553	19,835	20,215	20,472	20,770	21,020	21,271	21,467	2.07	1.64
Path 26 Pacific Gas & Electric - South	1,781	1,893	1,857	1,902	1,942	1,978	2,006	2,045	2,071	2,101	2,126	2,152	2,172	2.12	1.67
Path 26 - Dept of Water Resources	34	89	89	89	89	89	89	89	89	89	89	89	89	21.00	8.27
Total Path 26	1,815	1,982	1,947	1,992	2,031	2,067	2,095	2,134	2,160	2,190	2,216	2,241	2,261	2.63	1.85
Southern California Edison	17,890	18,105	19,118	19,662	20,196	20,629	20,900	21,211	21,462	21,721	22,022	22,346	22,558	2.89	1.95
SCE Sales	16,117	16,288	17,194	17,682	18,164	18,556	18,796	19,075	19,297	19,527	19,796	20,085	20,274	2.86	1.93
Muni Sales	1,773	1,817	1,923	1,981	2,032	2,074	2,103	2,136	2,165	2,194	2,227	2,261	2,284	3.18	2.13
Pasadena Water and Power Dept	257	277	305	308	311	313	313	313	314	314	315	315	315	3.98	1.71
San Diego Gas & Electric	3,147	3,567	3,806	3,893	3,980	4,065	4,131	4,223	4,287	4,344	4,406	4,478	4,530	5.25	3.08
Dept of Water Resources - South	76	198	198	198	198	198	198	198	198	198	198	198	198	21.00	8.27
South of Path 15	21,371	22,147	23,426	24,061	24,685	25,204	25,542	25,945	26,261	26,578	26,941	27,337	27,600	3.36	2.15
Sacramento Municipal Utilities District	2,485	2,779	2,657	2,703	2,752	2,785	2,821	2,861	2,901	2,941	2,979	3,017	3,055	2.31	1.73
Los Angeles Department of Water and Power	4,805	4,910	5,372	5,426	5,490	5,533	5,559	5,588	5,608	5,634	5,668	5,693	5,731	2.86	1.48
Burbank Public Service Dept	232	249	275	278	280	282	282	282	283	283	284	284	284	3.98	1.71
Glendale Public Service Dept	240	258	285	288	290	292	292	293	293	294	294	294	294	3.98	1.71
Imperial Irrigation District	725	750	770	791	812	833	854	875	895	915	936	956	976	2.82	2.51
Far North & East Sierra	299	279	279	288	291	299	294	297	302	321	332	354	378	0.02	1.99
Non ISO	8,786	9,226	9,637	9,773	9,915	10,024	10,102	10,196	10,282	10,388	10,493	10,598	10,719	2.67	1.67
Total ISO	43,324	42,774	43,714	44,866	45,922	46,824	47,472	48,295	48,892	49,538	50,177	50,849	51,329	1.57	1.42
Total State	49,625	52,000	53,351	54,639	55,837	56,849	57,574	58,491	59,174	59,926	60,670	61,447	62,048	2.76	1.88
														0.55	1.34
Coincident Demand															
Total ISO Coincident Demand	42,286	41,750	42,667	43,792	44,822	45,703	46,335	47,138	47,721	48,352	48,975	49,631	50,100	1.57	1.42
Total Statewide Coincident Demand	48,436	50,755	52,073	53,331	54,500	55,487	56,195	57,090	57,757	58,491	59,217	59,975	60,562	2.76	1.88

Historic data through 2002
SMUD is included in ISO total through 2001.

Planning Area Totals	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2001-2006	2001-2013
PG&E	19,413	20,484	20,145	20,662	21,094	21,477	21,787	22,206	22,488	22,817	23,092	23,369	23,585	0.45	1.12
SMUD	2,485	2,779	2,657	2,703	2,752	2,785	2,821	2,861	2,901	2,941	2,979	3,017	3,055	0.47	1.07
SCE	17,890	18,105	19,118	19,662	20,196	20,629	20,900	21,211	21,462	21,721	22,022	22,346	22,558	0.44	1.11
LADWP	4,805	4,910	5,372	5,426	5,490	5,533	5,559	5,588	5,608	5,634	5,668	5,693	5,731	0.54	0.58
BGP	729	784	864	874	882	887	888	888	889	891	892	893	894	1.34	0.67
SDG&E	3,147	3,567	3,806	3,893	3,980	4,065	4,131	4,223	4,287	4,344	4,406	4,478	4,530	2.75	2.23
Other	1,024	1,029	1,049	1,079	1,103	1,132	1,148	1,172	1,197	1,236	1,268	1,310	1,354	1.52	2.37
DWR	131	341	341	341	341	341	341	341	341	341	341	341	341	6.40	2.62
Total	49,625	52,000	53,351	54,639	55,837	56,849	57,574	58,491	59,174	59,926	60,670	61,447	62,048	0.67	1.17

Source: Appendix D, CALIFORNIA ENERGY DEMAND 2003-2013 FORECAST, August 2003

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

California Independent System Operator Corporation	)	Docket No. ER04-____-000

DIRECT TESTIMONY OF
PHILIP R. LEIBER
ON BEHALF OF THE
CALIFORNIA INDEPENDENT SYSTEM
OPERATOR CORPORATION

Q1. Please state your name and business address.

A1. My name is Philip R. Leiber and my business address is 151 Blue Ravine Road, Folsom, California, 95630.

Q2. By whom and in what capacity are you employed?

A2. I am employed by the California Independent System Operator ("ISO") as Treasurer and Director of Financial Planning.

Q3. What are your duties and responsibilities?

A3. As Director of Financial Planning, I am responsible for coordinating the development of the ISO's annual operating and capital budgets, variance reporting, and rate filings. I am also responsible for treasury functions, including borrowing and investing of funds, risk management, and insurance.

Q4. Please describe your educational background.

A4. I received my Bachelor of Business Administration and Master of Accounting from the University of Michigan. I hold a Certified Public Accountant ("CPA") license issued by the State of California, the Certified Treasury Professional ("CTP") designation, and Certified Business Manager ("CBM") credential.

Q5. Please state your work experience prior to the work you are doing today.

A5. From 1992 through 1997, I was employed by Coopers & Lybrand, LLP in San Francisco, in various positions, most recently as a Manager in the Financial Advisory

Services group, and prior to that assignment in the audit practice. I performed financial analysis activities in a variety of contexts, including mergers and acquisitions, business reorganizations, and litigation.

In the audit practice, I was responsible for planning, executing, and reporting of financial audits of public and private companies, including some in the regulated utility industry, high technology, investment, and other industries.

My other employment has included teaching positions for university-level accounting courses, private CPA exam review courses, internal auditing and other public accounting firm experience.

I became involved in the electric industry restructuring efforts through my employment with Coopers & Lybrand. In late 1996, Coopers & Lybrand was retained by the ISO Restructuring Trust ("Trust"), a predecessor to the California ISO, as financial administrator for the Trust. I worked in this capacity for approximately 9 months, and then joined the ISO as an employee.

Q6. What is the purpose of your testimony in this proceeding?

A6. I am providing this testimony to support the ISO's 2004 Grid Management Charge ("GMC") rates. I was project co-lead for the 2004 GMC Rate Structure Project, a stakeholder process. Through this process, the ISO developed the rate structure for 2004, including the selection of service categories, and billing determinants. The

2004 GMC Rate Structure Project is described in detail in the testimony of Mr. Ben Arikawa, Exh. No. ISO-51. The structure of the ISO's new charge categories and the related billing determinants is described in the testimony of Dr. Barbara Barkovich, Exh. No. ISO-1, and Ms. Catherine Yap, Exh. No. ISO-3. The revenue requirements for each service category were first determined from the outcome of the ISO's 2004 budgeting process, which I will describe here.

Q7. Will you be sponsoring any exhibits in connection with your direct testimony?

A7. Yes. I will be sponsoring Exh. Nos. ISO-25 through 50, which were prepared under my direction and supervision. These exhibits include the Federal Energy Regulatory Commission ("FERC") Section 35.13 cost statements required in rate filings. The exhibits are numbered follows:

Exh. No. ISO-25	Section 35.13 Cost Statements, Period I
Exh. No. ISO-26	Section 35.13 Cost Statements, Period II
Exh. No. ISO-27	2004 Cost Allocation Calculation of Operations and Maintenance Revenue Requirement Spreadsheet
Exh. No. ISO-28	Memorandum from President CEO Terry Winter to ISO Personnel, June 30, 2003
Exh. No. ISO-29	September 25, 2003 Board of Governors Meeting: 2004 Budget Presentation Memorandum Dated September 19, 2003
Exh. No. ISO-30	September 25, 2003 Board of Governors Meeting: Proposed FY 2004 CAISO Budget
Exh. No. ISO-31	September 25, 2003 Board of Governors Meeting: Summary of Proposed FY 2004 Budgets Presentation
Exh. No. ISO-32	October 3, 2003 Public Budget Meeting: Agenda

Exh. No. ISO-33	October 3, 2003 Public Budget Meeting: Attendance
Exh. No. ISO-34	October 3, 2003 Public Budget Meeting: Summary of Proposed FY 2004 CAISO Budget
Exh. No. ISO-35	October 3, 2003 Public Budget Meeting: 2004 Budget Presentation Memorandum Dated September 19, 2003
Exh. No. ISO-36	October 3, 2003 Public Budget Meeting: Proposed FY 2004 CAISO Budget
Exh. No. ISO-37	October 3, 2003 Public Budget Meeting: Summary of Proposed FY 2004 Budgets Presentation
Exh. No. ISO-38	October 3, 2003 Public Budget Meeting: Calculation of Financial and Capital Operating Reserve Credit for 2004
Exh. No. ISO-39	October 3, 2003 Public Budget Meeting: Rate and Budget Summary
Exh. No. ISO-40	October 3, 2003 Public Budget Meeting: Development of ISO Rates Presentation
Exh. No. ISO-41	October 3, 2003 Public Budget Meeting: Rate Calculation and Work Papers (Draft and Preliminary)
Exh. No. ISO-42	October 3, 2003 Public Budget Meeting: Questions Submitted by the California Municipal Utilities Association and ISO Responses
Exh. No. ISO-43	October 3, 2003 Public Budget Meeting: Questions submitted by Pacific Gas and Electric Company and ISO Responses
Exh. No. ISO-44	October 15, 2003 Finance Committee Meeting: Summary of and Response to Stakeholder Comments on Proposed ISO 2004 Budget
Exh. No. ISO-45	October 15, 2003 Finance Committee Meeting: California Municipal Utilities Association Comments
Exh. No. ISO-46	October 15, 2003 Finance Committee Meeting: California Department of Water Resources Comments
Exh. No. ISO-47	October 15, 2003 Finance Committee Meeting: Approved Motion for 2004 Budget Approval
Exh. No. ISO-48	October 23, 2003 Board of Governors Meeting: Billing Determinant Update (Draft and Preliminary)

Exh. No. ISO-49	October 23, 2003 Board Presentation Regarding Proposed Budget and GMC Rates
Exh. No. ISO-50	October 23, 2003 Board of Governors Meeting: Budget Vote

Q8. How will your testimony be organized?

A8. First, I will describe the GMC and the components of the ISO revenue requirement.

Second, I will provide an overview of the budget process followed to develop the 2004 revenue requirement.

Third, I will describe changes in the ISO's revenue requirement from 2003 to 2004.

Fourth, I will describe the Section 35.13 Cost Statements included with this filing.

Last, I will describe some of the changes to the ISO Tariff being proposed in this filing.

Q9. As you testify, will you be using any specialized terms?

A9. Yes, I will use capitalized terms as defined in the Master Definitions Supplement, Appendix A of the ISO Tariff.

I. GMC And Revenue Requirement Overview

Q10. What is the GMC?

A10. The GMC is the mechanism through which the ISO recovers the costs necessary to perform its function as operator of most of California's electricity grid. These costs collectively are called the ISO's revenue requirement. The GMC for 2004 will consist of several service categories that were developed during a stakeholder process on a new GMC rate structure for 2004. Testimony by other ISO staff and experts will discuss these service categories, while my testimony will focus on the revenue requirement.

Q11. What are the elements of the ISO'S revenue requirement?

A11. The revenue requirement consists of five categories of costs that I will discuss throughout my testimony. These are operating and maintenance ("O&M") expenses, cash funded capital expenditures, debt service expenses, other expense recoveries, and the credit or debit from the operating reserve.

Cash funded capital expenditures are the capital expenditures funded through current year rates. Debt service costs consist of principal and interest payments for the ISO's start-up and development costs and some previous capital expenditures. The revenue requirement also contains certain offsets to such costs in the form of interest earnings on invested funds and certain minor fees collected outside the GMC. In addition, an operating reserve credit or deficiency affects the total amount of funds collected through the GMC. Collectively, all of these categories of costs comprise the ISO's overall revenue requirement that is recovered through the GMC. These various types of costs are budgeted and accounted for on a detailed basis, but in slightly different ways in the ISO's accounting systems.

Q12. Please discuss the operating and maintenance costs.

A12. The operating and maintenance costs are the operating costs for the ISO's various divisions, and include such costs as:

- Salaries and benefits;
- Building, leases, and facilities costs;
- Insurance;
- Third-party vendor contracts;
- Professional and consulting services;
- Legal and audit costs;
- Training, travel and professional dues; and
- Other miscellaneous costs.

Operating and maintenance (O&M) costs are both budgeted and incurred by the ISO's cost centers. The ISO currently has 73 cost centers, or departments, that are used to budget and record costs. The 73 cost centers are aggregated further to ISO Divisions, which are the responsibility of an ISO Officer. The ISO's Divisions include:

- Chief Executive Officer/MD02/Grid Planning
- Chief Financial Officer
- Information Services
- Grid Operations
- General Counsel
- Market Services
- Corporate & Strategic Development

During the budgeting process, each ISO cost center develops a proposed budget that is the subjected to the review process I will describe later. After the budget is created, approved, and filed, when the new year begins and as operating costs are incurred, they are recorded to individual cost centers. In addition to recording expenditures and budgeted amounts by cost center and expense type (as I have listed above), all ISO costs also are coded to an account in accordance with the FERC Uniform System of Accounts. In this rate filing, the ISO refers to both approaches to recording costs. For example, the budget presented to stakeholders for review and the ISO Governing Board for approval used the ISO's approach of displaying costs by cost center and expense type. Ultimately, the costs in this filing are presented in accordance with the FERC Uniform System of Accounts in the Section 35.13 statements required as part of a rate filing. These statements are provided in Exh. Nos. ISO-25 and 26.

Q13. How detailed is the operating cost information?

A13. Expenses are budgeted and recorded with a high degree of detail. The ISO records its expenses using a functional basis of accounting that provides detail on the nature of the expenditure and the responsible department, in addition to the use of the standard Uniform System of Accounts. For example, a cost center may budget for three consultants during the upcoming year. Information that would be recorded would include a description of the consulting projects or consultants, and the monthly expenses for each. This detailed information is recorded in the ISO's budgeting system, and is available for reference during the year. That level of detail has not been provided in this filing, however, where slightly more aggregated information is provided.

Q14. What are the ISO's capital related costs?

A14. Capital expenditures are defined as spending in excess of $2,000 for assets that provide a benefit beyond the current year. The ISO's capital costs consist primarily of computer software development and acquisition costs, but also include other items such as computer hardware and facilities related items. Most of the computer software is developed by outside vendors under contracts with the ISO. In the budgeting process, which I will discuss in further detail later, the ISO gathers information about each proposed program, including internal sponsor, description, justification, and cost. This information is recorded outside of the ISO's accounting system in a database.

During the budget year, after a project has gone through the required approval process, and as the work is being performed, the ISO records payments made under such contracts to its project accounting system, and such costs are recorded on the ISO's balance sheet and considered Construction in Progress ("CWIP"). Upon project completion the costs are transferred to the accounting systems fixed asset system to begin depreciation of these assets. These costs are not recorded by ISO Division or cost center, but rather by fixed asset categories, such as "EMS" and "Scheduling Infrastructure."

Q15. What are the debt service costs?

A15. In addition to operating and capital costs recovered through the GMC, the ISO recovers debt service related to bonds previously issued by the ISO that funded the ISO's startup and development costs, and certain later capital expenditure program costs. Over time, the interest and principal payments related to the bonds are paid by GMC collections. The ISO's bonds were issued in 2000, and will be fully retired in 2009. Debt service collections comprise approximately 20 percent of the total GMC.

Q16. What are the expense recovery items?

A16. The ISO also has certain other offsets to its revenue requirements, including interest earnings and other fee collections, such as fees charged to participants of ISO-sponsored training classes. As ISO Treasurer, I budget for these items. During the year, they are accounted for in a similar manner as operating expenses, except revenues are not recorded against a particular cost center.

Q17. What is the operating reserve credit?

A17. In addition to operating and debt service costs, the ISO collects operating reserve funds through the GMC. Operating reserve collections are intended to provide coverage for unforeseen expenses and to provide a cushion to enable debt service payments to be made. Operating reserve collections provide a necessary level of financial security demanded by ISO creditors. Operating reserve collections are budgeted in setting the annual GMC, and are collected at the rate of 25 percent of budgeted debt service each year. Operating reserve funds, to the extent that they exceed 15 percent of the operating budget for a particular GMC service category, also are available as an offset to the ISO's overall revenue requirement (or, in the case of a deficiency, are collected as an element of the ISO's overall revenue requirement). The 2004 revenue requirement includes a credit that reduces the revenue requirement by $17.8 million. The calculation of this amount is discussed elsewhere in my testimony.

II. The ISO's Budget Process

Q18. Please describe the ISO's current budget development and approval process.

A18. The current ISO budget approval process is described in general terms in the ISO Tariff (Appendix F, Schedule 1, Part D), and generally follows the practice used in previous years. In June 2003, the ISO Governing Board approved a schedule by which various events in the budget process are to take place.

The process of developing the 2004 budget began in July, when the ISO's various departments began preparation of their proposed budgets for the subsequent year. The process began with a memorandum from Terry Winter, the ISO's Chief Executive Officer, to all employees who would be involved in the budgeting process, providing the general framework and assumptions that would be used in the process. That memorandum is provided with this filing as Exh. No. ISO-28. After the preliminary budget was prepared and subjected to the internal review procedure, it was presented to the ISO's Finance Committee in early September for comments and guidance. The Finance Committee reviewed the proposed budget and recommended certain revisions. The budget was then posted to the ISO's website (Exh. No. ISO-30 "Proposed FY2004 CAISO Budget") and reviewed by the Governing Board in a pubic session at its September 25 meeting. While the ISO is a utility with certain legal obligations and must retain the ultimate authority to set a budget that meets its legal obligations and prudently incurred expenses as determined by ISO management, officers, and its Governing Board, posting of the preliminary proposed budget allows for public input on the budget before approval by the ISO Board of Governors and filing with FERC. Stakeholders were invited to submit comments and ask questions about the budget at a public budget meeting held on October 3 (Exh. Nos. ISO-34 through ISO-41). Some questions were asked and responded to by the ISO prior to the public budget workshop (Exh. Nos. ISO-42 through 43). The budget workshop was attended by ISO officers, various managers and staff, and stakeholders. In the three-hour meeting, the budget was examined in detail, and all interested parties were given the opportunity to participate in the discussion. Stakeholders were encouraged to submit any further questions in writing, so that they could be presented to the Finance Committee at its scheduled meeting on October 15.

At the October 15 Finance Committee meeting, the Committee was provided with a summary of stakeholder comments received by the ISO, Exh. No. ISO-44. Other written comments on the budget also were received and presented to the Finance Committee (Exh. No. ISO-45 and ISO-46). The ISO also presented the proposed budget at the Market Issues Forum stakeholder meeting on October 9, and held separate informational meetings on the proposed budget with the California Public Utilities Commission or CPUC on October 9. The ISO's Finance Committee recommended adoption of the proposed budget on October 15, 2003 (Exh. No. ISO-47). The final version of the budget was submitted for approval by the ISO's Governing Board on October 23 (Exh. Nos. ISO-49 and ISO-50.). During October, the ISO staff also prepared the Section 35.13 cost statements and testimony related to the 2004 budget and rates. (Exh. Nos. ISO-25 and 26).

Q19. Has this process generally been consistent with the process followed in previous years?

A19. Yes. The current budget process is a result of a settlement reached in the 1998 GMC filing, providing for transparency and public insight into the ISO's budgeting process, a settlement reached with respect to the 2002 and 2003 budgets, and also efforts to further improve the effectiveness of this process from year to year. The ISO has compiled with the terms of the Tariff that require the publication of budget calendar prior to the commencement of the budget process, and the holding of a budget workshop to discuss the proposed budget with stakeholders.

Q20. What was the goal for the O&M budget set forth by the ISO's CEO for 2004?

A20. The O&M budget was to provide adequate funding for the essential services provided by the ISO, but with due recognition of the need to constrain and reduce overall costs. The ISO's budget guidance indicated that the goal for the O&M budget was a budget at least $15 million lower than the 2003 O&M budget of $171.8 million. This

$15 million reduction was related to anticipated savings from a new communications service contract for 2004. Apart from these savings, the objective was for flat, or preferably reduced spending. To encourage this, each ISO Division (the vice presidential level in the organization) was instructed to present a reduced budget, or ways that the proposed budget could be reduced by 7%.

Q21. How was the O&M budget constructed?

A21. The O&M budget was constructed in the same manner as in past years. Consistent with the budget guidance provided by the CEO, departments were instructed to develop a "base budget", which would include those services contemplated in the 2003 budget that would be necessary for 2004. Additional programs would be documented separately as "incremental programs." Possible cost saving measures that would have a significant impact on ISO service were documented separately as "decremental programs". These budgets are reviewed and modified through several iterations. The ISO Officers considered all of these separate programs and developed a "management recommended budget" consisting of the base budgets, the most essential incremental programs, and the cost saving programs that could be realistically implemented without an excessively negative impact on the overall level of service offered by the ISO.

Q22. Was the O&M budget goal achieved?

A22. Yes. The proposed O&M budget of $151.7 million is $20.1 million lower than the 2003 budget. To arrive at this reduced budget, each ISO Division complied with the budget goal set forth in the CEO's guidance memorandum, either presenting a reduced budget or ways that the budget could be reduced at some cost to service levels. Certain Divisions proposed lower base budgets, meaning they indicated they could perform their required functions for 2004 at less cost than in 2003, without a significant impact on service levels. Others presented potential "decremental programs" for discussion to meet the 7% goal. Not all of the presented decremental programs were accepted, however, as some were viewed as having too significant of an adverse impact on service. Additionally, there were certain incremental programs that were viewed as necessary for 2004. The management-recommended budget of $151.7 million provides for reduced spending in five of the ISO's seven Divisions. For two of the Divisions, spending is higher than in the 2003 budget, due to a variety of factors. For these Divisions, incremental programs included in the management-recommended budget or cost increases in the base budgets exceeded any decremental programs that were included. As examples, in the Chief Financial Officer Division, cost increases were the result of higher insurance costs in 2004 for the same level of coverage maintained in 2003, higher audit costs due to increased audit scopes, higher facility operating expenses, and expanded building security costs. Extensive discussions of the responsibilities and costs for each ISO cost center were prepared during the budgeting process to justify these and other cost changes.

Certain of this cost material provides budget detail that the ISO desires not to release for public dissemination to avoid providing information to prospective vendors. The ISO will make this information available during the course this rate case proceeding.

This material was provided to the ISO's Governing Board, as well as to stakeholders executing a confidentiality agreement during October 2003. A version of the ISO's budget proposal that omitted this detail was posted to the ISO website and is submitted as Exh. No. ISO-30 – "Proposed FY2004 CAISO Budget".

Q23. How does the ISO's staff prepare the proposed capital budgets each year?

A23. During July, the ISO Finance Department commences the budgeting process. The capital budgeting process is performed concurrently with the operating budget development process, as they are related -- the size and composition of the capital budget can have an effect on the operating budget. As a starting point, the Finance Department distributes a list of projects that were proposed earlier, but which have not yet commenced. Managers and directors review the list, and make additions and deletions to arrive at a list of potential projects that might be completed in the subsequent year (*i.e.*, the "Budget Year"). These projects include internally-generated project proposals or process changes, regulatory-mandated changes, stakeholder requests, and other business needs.

The sponsor of each potential project is responsible for developing or reviewing the capital cost estimate and justifying the benefits and need for the program. The number of projects suggested generally will exceed the number the ISO is able to implement in terms of staffing resources and preliminary funding limits. The ISO Directors and Officers therefore will eliminate those projects that are beyond the preliminary budget and staffing constraints. This is an iterative process that goes through several cycles. The Finance Department maintains the list of proposed projects and re-circulates it to ISO Directors and Officers throughout the process. The projects that are included in the final proposed project listing are those projects considered most critical by management. The list, including descriptions of proposed projects, was made available to stakeholders by a posting on the ISO's website (Exh. No. ISO-30). The listing was masked to exclude the dollars associated with individual projects, but a summary of costs by area was provided. The masking of individual project costs is necessary to avoid releasing sensitive data to potential ISO vendors.

This process results in the capital budget that is reviewed with the Finance Committee of the Board and then submitted to the full Board for approval.

It is important to recognize that the capital budget that is approved by the Board is not a static list of projects that will be implemented during the next year. Rather, it is a list indicative of the magnitude of anticipated overall spending, and the priorities at that time.

Q24. Is there any additional review of proposed projects before they are implemented?

A24. Yes. During the course of the Budget Year, before spending on a project proceeds, the project is subjected to a rigorous internal review at the ISO. First, a proposed project is brought to the ISO Project Steering Committee, consisting of ISO Directors, and also attended by ISO Officers and Managers. A summary of the proposed project is presented and the project sponsor must justify the need for the project. If a proposed project clears this Committee, the project sponsor may proceed to prepare the additional documentation that is required before any project commences. This project documentation consists of a business impact analysis, risk analysis, system impact analysis, and cost-benefit analysis. Once completed, the documentation is reviewed by all parties required to authorize a project in the ISO. These parties include a responsible Directors, Executive Sponsor (an ISO Officer), the ISO Project Steering Committee leader, the Chief Financial Officer, and CEO (if the project is over $100,000). All projects with a value in excess of $100,000 must be approved by the ISO's CEO. All projects with costs in excess of $1 million are brought to the Board for approval.

All approved Capital Projects are tracked and results reported to management on a monthly basis, both with regard to their financial status and their level of completion to date.

Q25. Were any changes made to the budget or rates after the posting of the preliminary proposed budget on the ISO website?

A25. The ISO's preliminary budget was first posted to its website on September 19, 2003. This posting listed a proposed O&M and capital budget of $151.7 million and $32 million respectively. These have remained unchanged, and are the amounts included in this filed revenue requirement. That posting did contain certain assumptions that have changed, however. For example, that posting indicated that additional study was necessary to finalize the operating reserve credit for 2004, the cost allocation factors for the GMC service categories, and the billing determinants for 2004. As this work was completed, updates of the budget and rates proposed for 2004 were released later in September and through October.

III. Changes In Revenue Requirement From 2003 To 2004

Q26. How did the ISO's overall revenue requirement change from 2003 to 2004?

A26. For the ISO as a whole, the revenue requirement decreased from $237.6 million to $218 million. These figures are the ISO's net revenue requirement, after the effect of any carry-forwards from the prior year due to the effect of the ISO's operating reserve. On a gross basis, the revenue requirement decreased from $246 million to $236 million. Because the ISO's rates are unbundled, a separate revenue requirement is calculated for each service category. At this point I will generally describe the revenue requirement of the ISO as a whole.

Q27. What were the causes of the changes from 2003 to 2004?

A27. Four main factors caused the change in the overall revenue requirement. These were:

- Operating and Maintenance Budget
- Cash Funded Capital Expenditure Budget
- Expense Recovery Budget
- The Available Revenue Credit or Deficiency

Q28. Please explain the decrease in the O&M budget.

A28. The O&M budget decreased from $171.8 million to $151.7 million, a decrease of $20 million, or about 11.6% percent. The decrease was the result of reduced telecommunications costs, lease expenses, consulting, travel and training, legal costs, employee relocation costs, professional dues, and an additional allowance for headcount vacancy. These reductions were offset partially by increases in salary and benefits (for four additional staff, and Salary and compensation adjustments for ISO employees), insurance costs, audit costs, facilities operating expenses, building security, temporary staff, property taxes, and office supplies. These changes in costs are detailed in Exh. No. ISO-30.

Q29. Please explain the changes in the debt service budget.

A29. Overall debt service is anticipated to remain nearly constant from 2003 to 2004, at $43.8 million and $43.7 million respectively. The ISO's bonds, issued in year 2000, are amortized over 9 years. The bond amortization schedule was decided to provide relatively level overall debt service. Each year, more of the debt service is applied to principal, and proportionately less to interest. Additionally, each year the ISO updates the anticipated interest related expenses by developing a forecast of interest costs, based on actual interest costs paid on the bonds in past years. The ISO's bonds are variable rate demand bonds, for which the interest rates are reset weekly. The ISO has an interest rate swap that eliminates most variable interest rate risk on about 2/3 of the outstanding bonds.

Q30. Please explain the changes in the cash funded capital expenditure budget.

A30. The ISO has budgeted $32 million to support its capital expenditure needs for 2004. The $32 million compares with a capital budget of $22 million in 2003. The $32 million budget consists of $22 million for MD02 and $10 million for other projects. For 2003, the composition was $15 million and $7 million respectively. This $32 million is to be funded directly from the revenue requirement. Direct funding of capital expenditure through the revenue requirement is also the approach used by the ISO in its 2003 rates.

Q31. Why has the ISO not planned to fund 2004 capital expenditures with a bond issuance?

A31. In the ISO's rate filing for 2002, the ISO anticipated a bond issuance to fund a portion of its capital expenditure budget. Because of the continuing after effects of the energy crisis of 2000/2001, however, such a bond offering was not possible. While the outlook for the ISO's ability to issue bonds has improved since that time, it is still unclear whether the ISO would have access to the bond market in 2004. The ISO, at the time of this filing, still has a "D" credit rating from one of the national credit rating agencies, and this rating has made even renewing existing bond related agreements very problematic. While the ISO has been in discussions with this credit rating agency to address this issue, the duration and outcome of this effort is uncertain. Even if the ISO's credit rating is restored to an investment grade rating, which would facilitate a bond offering, there may be other factors that still exist that would make obtaining such financing infeasible.

Q32. What are those factors?

A32. First, there are still certain issues that are likely to make creditors reluctant to lend to the ISO. The ISO governance issue has yet to be resolved. Based on discussions with the ISO's financial advisor in 2001, this uncertainty would have precluded a bond offering at that time, even apart from the other events and uncertainty of the financial crisis at that time. Additionally, during the past year there have been various bills introduced in the California legislature that would effect the structure and outlook of the electric industry in California significantly, including SB888, which purported to "not mend, but end deregulation" in California. Similarly, the recent change in administrations of the California governor raises the question of significant change in the energy structure in California. For example, there has been talk of consolidating the multiple state agencies that have a role in the energy sector in California (including the California Energy Commission, CPUC, Consumer Power Authority, and EOB). It is uncertain whether these changes would have direct effect on the ISO, but significant uncertainty remains at this time that might make borrowing problematic.

Q33. What would be the impact on the revenue requirement if the ISO could make a bond offering to fund capital spending?

A33. Because the ISO has not executed a bond offering since 2000, and has funded capital expenditures through direct funding from the GMC rate in 2002 and 2003, the ISO has reached a "steady state" with respect to the rate impact of funding its capital expenditure program. If the ISO's capital funding needs are relatively stable, as they have been since 2002 and going into 2004, the effect of bond financing these expenditures versus funding them through the rates provides roughly the same overall rate level.

Q34. Please explain this concept.

A34. It appears that the ISO's capital expenditure needs have stabilized to between $22 million and $32 million per year. Most capital project spending is for computer software development, which has an expected useful life of between 3 to 5 years. If such spending is funded with bonds that are amortized over a three-year period, the effect of funding the expenditures directly through rates equals the cost of debt service had a bond offering been done each year for the past three years.

Q35. Can you provide an example to illustrate this point?

A35. Yes. Consider the following two options to fund a steady stream of capital expenditures of $30 million per year:

Option A: Fund through rates

	Year 1	Year 2	Year 3	Year 4
Capital Budget	$30	$30	$30	$30
Effect on revenue requirement	$30	$30	$30	$30

Option B: Issue Bonds

	Year 1	Year 2	Year 3	Year 4
Capital Budget	$30	$30	$30	$30
Effect on revenue requirement	$10	$20	$30	$30
Consisting of:				
Principal Repayment, Year 1	$10	$10	$10	-
Principal Repayment, Year 2	-	$10	$10	$10
Principal Repayment, Year 3	-	-	$10	$10
Principal Repayment, Year 4	-	-	-	$10

As this example illustrates, if capital expenditure needs are relatively stable, as they appear to be in the case of the ISO, and the expenditures fund assets with relatively short useful lives, such as computer software, by year 3, the cost to ratepayers for the capital expenditure program is the same under either approach. It appears the ISO has reached this steady state, and accordingly, continued bond offerings may not be advantageous. Should capital needs be significantly higher in one year versus others, this conclusion would not hold, and it accordingly might be appropriate to fund the costs over several years through a bond offering.

Q36. What if the ISO'S credit rating is restored later in 2003 or during 2004 and a bond offering becomes possible?

A36. The question is speculative as it is not at all certain that the ISO's credit rating will be upgraded in that time frame. If it does turn out that the ISO's credit rating is increased to a level where a bond offering would be possible, however, the ISO would evaluate at that time whether a bond offering would be advisable. This assessment would consider factors such as the transaction costs of an offering, the anticipated spending needs in the subsequent year, and the possibility of refinancing existing debt for savings opportunities. If a bond offering turns out to be possible and advisable in 2004, and permits a temporary reduction in the ISO revenue requirement, the reduction would be reflected via adjustment to the ISO rates in 2005, through the operating of the operating reserve, which I discuss below.

Additionally, given the illustration I just discussed, by the end of 2006, assuming level spending, the revenue requirement would be at approximately the same level whether we continue funding capital expenditures directly from rates or by issuing bonds. So, any "savings" that might result from executing a bond offering in 2004, should one be possible, would be only temporary. If a bond offering is possible and planned in 2004, the ISO would file with the Commission a Section 204 filing requesting authorization for the issuance, if necessary.

Q37. Please explain the changes to the expense recovery budget.

A37. The expense recovery budget decreased from $2.6 million in 2003 to $2.3 million in 2004. This budget consists of various offsets to the ISO revenue requirement, including interest income, Western Electricity Coordinating Council ("WECC") reimbursements for the security coordination function, and Scheduling Coordinator application fees. The decrease is due to lower budgeted interest earnings on the

ISO's operating funds. Interest rates have fallen since 2002, when the 2003 budget was prepared. Because the ISO's cash balances are invested primarily in investments with very short durations (either money market mutual funds or highly rated bonds with maturities of less than five years), the low interest rates in the current environment reduce the ISO's interest earnings.

Q38. How does the operating reserve account affect the 2004 revenue requirement?

A38. The operating reserve acts as a balancing account related to the costs of previous years. Accordingly, costs and revenues from year 2003 (and earlier years) affect the revenue requirement in 2004. The balances in the operating reserve account were calculated by considering all of the items that effect the operating reserve, including revenues, expenses, and other uses of the reserve account.

Q39. How did the operating reserve affect the revenue requirement for each 2004 GMC category?

A39. First, the operating reserve balances were calculated on the basis of the existing three GMC service categories that have been in effect for 2003. A revenue requirement credit was calculated for 1) Control Area Services, 2) Congestion Management, and 3) Ancillary Services and Real Time Energy Operations. Because these categories are to be replaced with new services in 2004, the credits had to be "mapped" or applied to the new service categories. I discuss this process later in my testimony.

Q40. Did the ISO follow the procedure discussed in the 2001 rate filing with respect to this issue?

A40. Yes. In my testimony related to the 2001 rates, I discussed the process that the ISO would use to reconcile the actual costs and revenues for its services with the budgeted costs and revenues. I noted that the rates for the three ISO Service Categories will be set annually based on budgeted costs and a forecast of the billing determinant for each service, and that an operating reserve will be maintained for each ISO service category to record the variance between budget and actual figures. I also noted that the operating reserve is funded annually with a collection of 25 percent of budgeted debt service, and that the operating reserve ultimately is targeted to build to a level equal to 15 percent of overall budgeted operating expenses by ISO service category. I also noted that because the operating reserve includes the effects of variances from one year to the next, it is possible that some excess collections in one year will be used to subsidize rates in a subsequent year, or vice-versa. Finally, I discussed that the operating reserve helps serve an essential purpose to ensure that the ISO will have sufficient resources in the event of variances during the year.

This mechanism has served its intended purpose, and has worked according to the procedures I noted would be in place in the 2001 rate filing.

Q41. How was the operating reserve calculated for each service category?

A41. This required a comprehensive analysis, which was performed separately for each service category, in a two-part process: first a true-up of the reserve balance as of

December 31, 2002, and then forecasting the reserve balance as of December 31, 2003 I will now provide an overview of the steps involved in the process. The final calculation was provided in the budget package submitted to the ISO Governing Board for approval that was also posted to the ISO web-site on October 17, 2003. Exh. No. ISO-49. The steps were as follows:

- Start with the beginning reserve balance at January 1, 2002
- Next, show the 2002 items that affected the reserve balance, first according to the 2003 rate filing (which included forecasts/estimates), and then based on actual experience. This included listing items affecting the reserve during 2002, including revenues, expenses, capital expenditure funding, and other items affecting the reserve including Amendment 33 fines revenue, interest on refunds in the 2002 GMC settlement. Several pending matters require that funds be set aside for likely distribution in 2004. Examples of these include the potential refunds related to the 2001 GMC rate case and other Matters Pending Dispute Resolution, Litigation or Appeal including interest on potential awards or judgments. The results of this calculation show the reserve balance and credit available for 2003 as estimated, and based on actual experience.
- Next, for items affecting the reserve during 2003, two sets of columns are shown. First, a budget column is shown, which illustrates what would happen to the reserve balance if everything in 2003 happened according to the budget. The next set of columns uses actual/forecast experience in 2003. In these columns, several matters affect the reserve balance that were not contemplated earlier. As these

columns require a forecast for the full year of 2003, these amounts are projected full 2003 year amounts.

- The results of this last step provide a forecasted ending reserve balance as of December 31, 2003.
- Compare the ending balance to the reserve requirement of 15 percent of 2004 O&M costs
- Use any excess or short-fall is used to adjust the 2004 revenue requirement.
- These steps are done separately for each of the GMC service categories that were in effect during 2002 and 2003.

Q42. What were the results of this calculation?

A42. For the Control Area Services category, there was a shortfall of $2.6 million. Several factors led to this result. Most significantly were items affecting the reserve balance as of December 31, 2002, including Matters Pending Dispute Resolution, Litigation or Appeal including interest on potential awards or judgments. Such matters primarily affected the Control Area Services category. This resulted in a lower ending reserve balance going into 2003 than was estimated in the 2003 rate filing, of $9.5 million versus $18 million. Items affecting the reserve balance in 2003 were positive overall, providing a contribution of $2 million, thus bringing the reserve balance to $11.5 million. To determine whether a credit or a deficit is to be applied to 2004, this balance is compared to 15% of the 2004 O&M budget. This results in a reserve deficit for the Control Area Services category of $2.6 million, which is collected through 2004 rates (through certain of the new GMC service categories for 2004.)

The other two GMC service categories have reserve credits for 2004. The same process as described for Control Area Services was followed in the calculation of these amounts. The reserve credit for Congestion Management is $2.8 million, while the reserve credit for Ancillary Services and Real Time Energy is $17.6 million. The credit is large for the latter category primarily because revenues for that GMC service are forecast to be significantly ahead of budget during 2003, by approximately $12 million.

Q43. Why is it necessary to collect the under-recoveries in 2004? Isn't it possible to just net the amounts together?

A43. The ISO Tariff requires that the reserve be calculated separately for each service category. The shortfall for the previous Control Area Services category must be maintained separately, and associated with the revenue requirement for the appropriate new GMC service categories for 2004. We are obligated to collect any shortfall and provide any revenue credit separately for each service category. This avoids cross-subsidies among customers that paid different GMC rates for the particular services used.

Q44. How are the reserve balances translated into the new GMC service categories for 2004?

A44. The reserve calculation I have discussed was based on the GMC service categories in effect during 2002 and 2003. Because the ISO is proposing new GMC service categories for 2004, it was necessary to reallocate the reserve credits and shortfalls from the old categories to the new ones. This was done by preparing a comparison of how 2003 and 2004 service categories related to each other, developing factors that associated reserve credits from the old to the new categories, and then using those factors to reallocate the reserve credit balances from the existing categories to the new categories for 2004. For each category of reserve credit (Control Area Services, Congestion Management, and Ancillary Services Real Time Energy Operations), the old GMC allocations were associated with the new allocations for the 2004 categories on a cost center by cost center basis. These associations were summed over all the cost centers to develop the factors to reallocate each category of reserve credit or shortfall. The detailed steps involved in this process are documented on a workpaper (Exh. No. ISO-27).

Q45. How did the rates change for 2004 from 2003 and from the indicative rates that were presented throughout 2003?

A45. The rates for the GMC service categories are different from what was in effect during 2003, as the service categories are different (although two of the new categories are similar to previous categories). Accordingly, direct comparisons of unbundled rates from 2003 to 2004 are not possible. Indicative rates for the new service categories were published during the stakeholder process and prior to this filing (pending availability of final budget information for 2004). The rates in this filing are comparable to those numbers, but differ due to several reasons, including use of the 2004 revenue requirement, cost allocation factors, and billing determinant forecasts for 2004. For the revenue requirement, the rates first published during 2003 used the 2003 revenue requirement to provide "indicative" rates under the new GMC structure. The 2004 revenue requirement is lower than the 2003 revenue requirement. Second, the indicative rates used cost allocations that were for 2003, while new cost allocations have been developed for this filing. Finally, the billing determinants used in this filing are the ISO's forecast for 2004, while previous rates were calculated based on 2001/2002 data.

Q46. How did the budget and rates change for 2004 change from what initially were presented to stakeholders for review in September 2003 and this filing?

A46. No changes were made to the O&M budget, debt service budget, or capital budget. The initial budget posting for stakeholder review did, however, indicate that certain items were tentative and subject to additional refinement up to the point of ISO Board review of the budgets and rates, and these items did in fact change. Changes were made to the operating reserve calculation, cost allocations, expense recovery budget, and billing determinant forecasts. I will discuss each of these in turn.

First, with respect to the operating reserve calculation, the ISO published an initial forecast of the Revenue requirement for 2004 that indicated the operating reserve credit could vary between $15 million and $28 million (Exh. No. ISO-30, page 16). Next, a detailed calculation of the operating reserve was released on October 1, 2003 (Exh. No. ISO-38, "Calculation of Financial and Capital Operating Reserve Credit for 2004"). This showed a reserve credit totaling $18.1 million. The final calculation showed a balance of close to the same amount, $17.8 million (Exh. No. ISO-27). The changes were the result of updating the forecast of 2003 revenues, increasing the provision for Matters Pending Dispute Resolution, Litigation or Appeal including interest on potential awards or judgment, interest on the Amendment 33 fine (see detail below) refunds, and the 2003 O&M expense forecast.

Second, the Expense Recovery Budget was updated to reflect a revised forecast for interest earnings in 2004. The amount was increased to reflect higher cash balances that likely would persist further into 2004. This was an increase of some $200,000.

Third, the cost allocations were updated. In the first budget posting (Exh. No. ISO-30, Proposed FY2004 CAISO Budget) in late September 2003, the ISO used placeholders for cost allocation factors. These placeholders were those factors developed during the GMC stakeholder process, and were the factors that applied to the 2003 budget. The cost allocation factors for the 2004 budget were still under development as of late September. The first cost allocation factors applicable to the 2004 budget were posted to the website on October 2, *see* Exh. No. ISO-41 "Rate Calculation and Work papers (Draft and Preliminary)." The final figures used in this filing continued to be checked for errors and refined throughout October 2003.

Finally, like the cost allocation factors, the billing determinants initially presented in late September were used as placeholders pending availability of forecasted billing determinants for 2004. The first forecasted numbers for 2004 were posted to the ISO's website on October 1 (Exh. No. ISO-39, "Rate and Budget Summary"). Like the cost allocation factors, these figures were refined throughout October with the aim of developing an accurate forecast of volumes in 2004. The final billing determinants were posted to the ISO's website for the October 23, 2003 Board of Governors meeting (Exh. No. ISO-48).

IV. <u>SECTION 35.13 COST STATEMENTS</u>

Q47. What is the purpose of this part of your testimony?

A47. The purpose of this part of my testimony is to provide an explanation of the Period I and Period II cost statements included with this filing. In this filing, the ISO has used actual data from 2002 for Period I, and budgeted figures for 2004 for Period II. These statements are required by 18 C.F.R. § 35.13 and include:

Statement AA: Balance Sheets
Statement AB: Income Statements
Statement AC: Retained Earnings Statements
Statement AD: Cost of Plant
Statement AE: Accumulated Depreciation and Amortization
Statement AF: Specified Deferred Credits

Statement AG:	Specified Plant Accounts (other than Plant in Service) and Deferred Debits)
Statement AH:	Operation and Maintenance Expenses
Statement AI:	Wages and Salaries
Statement AJ:	Depreciation and Amortization Expenses
Statement AK:	Taxes Other than Income Taxes
Statement AL:	Working Capital
Statement AM:	Construction Work in Progress
Statement AN:	Notes Payable
Statement AO:	Rate for Allowance for Funds Used During Construction
Statement AP:	Federal Income Tax Deductions - Interest
Statement AQ:	Federal Income Tax Deductions - Other Than Interest
Statement AR:	Federal Tax Adjustments
Statement AS:	Additional State Income Tax Deductions
Statement AT:	State Tax Adjustments
Statement AU:	Revenue Credits
Statement AV:	Rate of Return
Statement AW:	Cost of Short-Term Debt
Statement AX:	Other Recent and Pending Rate Changes
Statement AY:	Income and Revenue Tax Rate Data
Statement BA:	Wholesale Customer Rate Groups
Statement BB:	Allocation of Demand and Capability Data
Statement BC:	Reliability Data

Statement BD:	Allocation Energy and Supporting Data
Statement BE:	Specific Assignment Data
Statement BF:	Exclusive-Use Commitments of Major Power Supply Facilities
Statement BG:	Revenue Data to Reflect Changed Rates
Statement BH:	Revenue Data to Reflect Present Rates
Statement BI	Final Cost Adjustment Factors
Statement BJ:	Summary Data Tables
Statement BK:	Electric Cost of Service, Total and as Allocated
Statement BL:	Rate Design Information
Statement BM:	Construction Program Statement

Some of these statements are not applicable to the ISO, as I will explain in each relevant case.

Q48. How is this portion of your testimony organized?

A48. I will provide a brief explanation of each statement according to the order listed above.

Q49. Do the statements listed above identify the costs by unbundled cost category?

A49. Yes, they do, where appropriate. For 2004, the new GMC service categories are used, and the costs reflect the proposed 2004 budget and cost allocations. For 2002, the ISO had a different GMC rate structure in effect. For comparative purposes, therefore, the costs have been shown on a pro forma basis, as if the new rate structure had been in effect.

Statement AA: Balance Sheets

Statement AB: Income Statements

Q50. Please summarize the contents of Statements AA And Statement AB.

A50. Statements AA and AB contain the FY2002 Balance Sheet and Income Statement (Period I), and a forecasted Balance Sheet and Income Statement for FY 2004 (Period II). The financial statements are prepared on an accrual basis of accounting in accordance with generally accepted accounting principles ("GAAP"). The total and component values of Statement AA for Period I agree with the ISO's FERC Form 1 filing for 2002. The values for the Period II Statement AA are forecast for December 31, 2003.

Q51. Please explain the various accounts included in the financial statements.

A51. I will provide details and explanation of the various accounts throughout my testimony.

Q52. Does Statement AB serve as support for the ISO'S rates and revenue requirement?

A52. Not really. This statement provides some information about the ISO's financial results, but is not directly used in setting the rates or revenue requirement. The reason for this is that the ISO's rates are calculated based on actual spending in a given year, including O&M costs and debt service costs. Statement AB includes depreciation, which is not an actual cash expenditure, and does not include debt service principal payments. Also, it does not include cash funded capital expenditures, which may be collected through the ISO's rates. In summary, this statement does not match the rate formula used to establish the ISO's revenue requirement, as set forth in the ISO Tariff. The statement for Period II shows that the ISO has significant "net income" of nearly $46 million. This is due to relatively low depreciation expenses in 2004; the rates, however, are based recovery of debt service, not depreciation. The rates are set based on the cash needs of the ISO, and do not results in an "over-collection" on this basis.

Statement AC: Retained Earnings

Q53. Please provide an explanation of Statement AC, Retained Earnings.

A53. In a for-profit entity, retained earnings are net profits that are kept to accumulate in a business after dividends are paid. A retained earnings statement is required by GAAP whenever comparative balance sheets and income statements are presented. The ISO, however, is a not-for-profit, public benefit corporation. Therefore, the ISO does not have "retained earnings" in the sense that the term is typically used.

Q54. What is included in the ISO's statement AC, Retained Earnings?

A54. The retained earnings statement shows changes to the account, such as profits or losses from operations and any items charged or credited to retained earnings. Retained earnings are negative for the ISO for Period I, due to start-up costs which, for generally accepted accounting purposes, were charged to earnings as incurred. For rate-making purposes, these costs are recovered over time, through debt service charges that comprise part of the ISO's annual revenue requirement. Over time, as the ISO approaches the end of its debt service term (primarily in 2008, with $4 million of remaining debt to be retired in 2009), the retained earnings will eventually reach "0". The negative retained earnings balance does not adversely affect the ISO, but requires explanation to potential lenders or creditors. For Period II statements, the "retained earnings" balance is positive due to the relatively large "net income" carried forward from Statement AB.

Statement AD: Cost Of Plant

Q55. Please provide an explanation of Statement AD, Cost of Plant.

A55. Statement AD provides an overview of the ISO's cost of plant, consistent with standard FERC reporting categories. The average balances are based on a beginning-of-period and end-of-period simple average. All fixed assets are recorded at cost. The cost of plant is split into two functional classifications: Intangible and General. The Intangible Plant functional classification includes the following items:

Software - Primary Systems
Energy Management System (EMS)
Scheduling Infrastructure (SI)
Scheduling Applications (SA)
Settlements System
Metering and Data Acquisition System (MDAS)
Security (CUDA)
Others
Software - Corp Systems

The General Plant functional classification includes:

Structures and Improvements
Leasehold Improvements
Office Furniture and Equipment
Furniture
Transportation Equipment
Field Vehicles
Communication Equipment
Other Tangible Property
Hardware - Primary Systems
Energy Management System (EMS)
Scheduling Infrastructure (SI)
Scheduling Applications (SA)
Settlements System
Metering and Data Acquisition System (MDAS)
Others
Hardware - Corp Systems

The information is presented for Period I and Period II. Period I uses actual recorded data for the year 2002. Period II averages are based on partial year 2003 actual data, forecast information for the remainder of 2003, and the 2004 proposed capital budget.

Statement AE: Accumulated Depreciation And Amortization

Q56. Please explain the purpose of Statement AE, Accumulated Depreciation And Amortization.

A56. Statement AE presents the accumulated depreciation data for the recorded year 2002, and forecast balances for year 2004. Averages for accumulated depreciation and amortization are based on a beginning-of-period and end-of-period simple average. Depreciation is computed on the straight-line method over the assets' estimated useful lives, which range from 3-10 years. Software is generally 5 years, computer hardware 3 years, and leasehold improvements 10 years. The amortization and depreciation rates are calculated by dividing the average balances by their respective depreciation expenses.

Q57. When were most of the ISO's fixed assets placed in service?

A57. Most fixed assets were placed in service on March 31, 1998, when the ISO commenced operations. The ISO has continued to make a substantial investment in necessary fixed assets since that date, however. The cost of improvements to, or replacement of, fixed assets is capitalized. Because the ISO revenue requirement is based on debt service recovery rather than depreciation, the issue of when assets are formally placed in service does not have an impact on rates. Accordingly, this concept is not as important for the ISO as it is for utilities that request a return on rate base.

Q58. How does the ISO account for assets that are retired?

A58. When assets are retired or otherwise disposed of, the cost and related depreciation are removed from the accounts and any resulting gain or loss is reflected in income for the Period. Gains and losses on dispositions of assets are not used in setting the ISO's GMC rates, but are only used for financial statement purposes. Repairs and maintenance costs are charged to expense when incurred.

Large portions of the ISO's existing software infrastructure will be retired in 2005 when the new MD02-related systems are deployed, but this is not reflected in the 2004 balances. It is also worthwhile to note that the ISO still may be recovering the costs of assets that are no longer in service through the revenue requirement, as the revenue requirement includes funds for debt service on the ISO's year 2000 bond issuance.

Q59. What assets are capitalized?

A59. The ISO generally capitalizes costs in excess of $2,000 where the spending provides a benefit for beyond the current fiscal year. For GAAP financial statement purposes, the ISO capitalizes direct costs of salaries and certain indirect costs incurred to develop or obtain software for internal use. Costs of software development related to abandoned projects are expensed when the decision to abandon is made. Internal ISO costs are not capitalized for purposes of the GMC rates, however -- items originally budgeted as O&M costs are not reclassified to the capital budget. Debt issuance costs also are capitalized and amortized, using the bonds outstanding method.

Statement AF: Specified Deferred Credits

Q60. Please explain the contents of Statement AF, Specified Deferred Credits.

A60. Deferred credits include Post Retirement Liability and Supplemental Executive Retirement Plan liability. The Post Retirement Medical Benefit Plan provides for post retirement health care benefits to all employees who retire from the ISO on or after attaining age 60 with at least five years of service. The Supplemental Executive Retirement Plan is a non-qualified plan intended to provide selected executives of the

ISO with target retirement benefits. Amounts for 2004 are estimated pending the availability of actuarial calculations in 2005.

Statement AG: Specified Plant Accounts And Deferred Debits

Q61. Please explain the contents of Statement AG.

A61. Averages for deferred debits are based on a beginning of Period and end of Period simple average. Year-ending balances of capitalized debt issuance costs are the only items on this schedule. The balances for December 31, 2004 include the remaining un-amortized balance of debt issuance costs from the year 2000 bond issuance.

Statement AH: Operation And Maintenance (O&M) Expenses

Q62. What expenses are included in Statement AH?

A62. Statement AH is a summary of nearly all O&M expenses (only property taxes are excluded.) Period I includes actual data for FY2002. Period II costs are forecasted based on the 2004 budget. Allocations to the unbundled cost categories for FY2004 are based on a thorough allocation process described by another ISO witness. Because the ISO's GMC was not unbundled in the same manner in FY2002 as in FY2004, the allocations for FY2002 are estimated. The cost allocation percentages are those during the stakeholder process for discussion purposes for the FY2003 budget. Expenses for the following line items are included in Statement AH:

560 Operation Supervision and Engineering

561 Load Dispatching

566	Miscellaneous Transmission Expenses
568	Maintenance Supervision and Engineering
901	Supervision
902	Meter Reading Expenses
903	Customer Record and Collection Expenses
905	Miscellaneous Customer Accounts Expenses
907	Customer Service and Informational Expenses – Supervision
908	Customer Assistance Expenses
909	Informational and Instructional Advertising Expenses
920	Administrative and General Salaries
921	Office Supplies and Expenses
923	Outside Services Employed
924	Property Insurance
925	Injuries and Damage
928	Regulatory Commission Expenses
930	Miscellaneous General Expenses
931	Rents
935	Maintenance of General Plant

Q63. Please provide a detailed explanation of the O&M costs.

A63. The ISO prepares elaborate detail to support its annual budget proposal. All of this information is retained by the ISO, and a summary of it (including major changes in the ISO's budget from 2003 to 2004) is made available during ISO's budget stakeholder review process. *See* Exh. No. ISO-30, Proposed FY2004 CAISO Budget. The ISO does not release to the public all supporting budget information due to the need to keep certain of this information from being used by ISO vendors against the interests of the ISO and ratepayers.

Statement AI: Wages and Salaries

Q64. What expenses are included in Statement AI?

A64. Statement AI includes all wages and salary expenses. Period I includes actual data for FY2002. Period II costs are forecasted based on a comprehensive budgeting process described earlier in my testimony. Allocations to the unbundled cost categories for FY2004 are based on a thorough allocation process described in the testimony of Dr. Barbara Barkovich (Exh. No. ISO-1) and Catherine E. Yap (Exh. No. ISO-3. Expenses for the following line items are included in Statement AI:

560	Operation Supervision and Engineering
561	Load Dispatching
566	Miscellaneous Transmission Expenses
568	Maintenance Supervision and Engineering
901	Supervision
902	Meter Reading Expenses
903	Customer Record and Collection Expenses
905	Miscellaneous Customer Accounts Expenses
907	Supervision

908 Customer Assistance Expenses

920 Administrative and General Salaries

921 Office Supplies and Expenses

935 Maintenance of General Plant

ISO salary costs are budgeted using actual salaries for all positions that currently are filled, and estimated costs for unfilled or new positions. Budgeted salary costs initially assume all positions are filled throughout the year. Some of the cost savings generated from actual position vacancies generally are used to fund other human resource related costs, such as recruiting costs, relocation costs, or temporary and contract staff to fulfill the work while the position is vacant. Beginning in 2003, however, the ISO also began to reduce its budgeted salary and benefit costs through the inclusion of a "headcount vacancy factor." This headcount vacancy factor was estimated as $1.2 million in 2003, and increased to $2 million in 2004. The $2 million figure is approximately 2.4% of salary and benefit costs, and would equate to providing funding for 585 staff on an annualized basis, rather than the ISO's gross budgeted staff of 599.5. The headcount vacancy factor was distributed to each ISO Division based on its proportional share of total salaries and benefits.

In addition to actual base salary costs, the compensation figures include related benefit costs, budgeted at 33 percent of base salary costs, to cover all employer paid compensation costs such as payroll taxes, and the cost of benefits such as medical, dental, vision, and life insurance coverage. The figures also include the costs of the

ISO's incentive compensation program. All ISO employees are eligible to receive from 12-20 percent of their compensation (the eligibility percentage is from 50 to 100 percent for ISO Corporate Officers) in an annual incentive payment based on the achievement of corporate goals. The actual pay-out will vary between 0 and 100 percent of the theoretical maximum depending on how well the ISO achieves its corporate goals. For budget purposes, a pay-out ratio of 73 percent for 2004 was assumed, based on historical payments that have ranged from roughly 70-85%.

ISO staff and officer compensation is benchmarked annually against the utility industry and other peer organizations. ISO total compensation is established to be in the 75th percentile of comparable firms.

Statement AJ: Depreciation And Amortization Expenses

Q65. Please explain the purpose of Statement AJ.

A65. Statement AJ shows the depreciation expenses for Period I (FY 2002) and Period II (estimated FY2004). As I mentioned earlier, depreciation expense is not used in the calculation of the ISO's rates.

Q66. Please explain how depreciation rates are computed in Statement AJ.

A66. The annual depreciation rates shown in this schedule are calculated by dividing annual depreciation expenses by the average fixed asset balances. Depreciation expenses for FY2002 are actual amounts. The depreciation expenses amounts are calculated using estimated fixed asset balances by asset class, assuming capital additions according to the ISO's 2004 capital budget.

Q67. Please explain what assets are included in the general and intangible functional categories.

A67. Assets are divided according to the same split into the General and Intangible functional categories as found in Statement AD, Cost of Plant.

Statement AK: Taxes Other Than Income Taxes

Q68. Please explain what is included on Statement AK, Taxes Other Than Income Taxes.

A68. The following tax expenses are included on Statement AK: property taxes (including state use tax and environmental fees), and employer payroll taxes.

Q69. What is included with the employer payroll taxes?

A69. Employer payroll taxes include the following: FICA, Medicare, and California State Tax. FICA is based on 6.2 percent of employee wages up to the FICA wage limit. Medicare taxes include 1.45 percent of employee wages. The California State Unemployment Tax is 2.4 percent of first $7000 of compensation per employee. Employer payroll taxes are included in the labor costs detailed in Statement AI.

Q70. Please explain why property taxes are included on Statement AK.

A70. The ISO is exempt from most property tax due to a successful exemption petition completed in 2001 by the ISO (based on the ISO's tax-exempt status under section 501(c)(3) of the Internal Revenue Code). The ISO does pay property taxes on any equipment used but not owned by the ISO, however, including leased equipment. Additionally, the ISO pays property taxes on its unused land, purchased in 2000 for a headquarters facility that has not been constructed due the ISO's facility plan being put on hold as a result of the energy crisis. The 2004 budget amount is for these items.

Statement AL: Working Capital

Q71. Please explain the purpose of Statement AL.

A71. Statement AL shows an estimate of the ISO working capital by month during Periods I and II. For Period II, the beginning and ending balances are the forecasted operating reserve balances by service category. This information is not used directly in the calculation of the ISO's rates.

Q72. Can you explain what you mean by the "operating reserve"?

A72. As I described earlier in my Testimony, the GMC is designed to recover the Company's operating costs and debt service requirement and to provide for an operating reserve. The operating reserve (formally referred to in the ISO Tariff as the "Financial and Capital" Operating Reserve to distinguish it from the same term referring to an Ancillary Service) is funded annually by collections of 25 percent of debt service payments. The operating reserve accumulates until the reserve becomes fully funded (at 15 percent of budgeted annual operating and maintenance costs). At that point, any excess may be used to reduce the following year's GMC rate.

Q73. Will the operating reserve be fully funded at year end?

A73. Yes. It is anticipated that as of December 31, 2003, the operating reserve will, on a bundled basis, be fully funded. As I explained earlier, the operating reserve is calculated separately for each GMC service category.

Q74. Can you explain what type of cash and cash equivalents are included in the operating reserve?

A74. Cash and cash equivalents include cash on hand, governmental securities, commercial paper, mutual funds, and certificates of deposit with original maturities of three months or less. Cash and cash equivalents include restricted amounts held by a bond trustee under and indenture agreement and restricted amounts held for operating reserves. Cash and cash equivalents are held primarily with five financial institutions.

Statement AM: Construction Work In Progress

Q75. Please explain the purpose of Statement AM.

A75. Statement AM represents the FY2002 and FY2004 estimated average balances for construction work in progress ("CWIP"). The averages are based on a beginning of Period and end of Period simple average.

The ISO classifies its CWIP for purposes of this statement into two functional classifications: Intangible and General. Eighty percent of construction work in progress is considered intangible, and twenty percent is considered tangible.

The ISO does not earn a return on rate base as most utilities do, so this schedule is not used in any way in the calculation of the ISOs rates.

Statement AN: Notes Payable

Q76. Please explain the purpose of Statement AN

A76. Statement AN includes notes payable. The ISO did not have any notes payable in 2002, and does not project having any notes payable in 2004.

Statement AO: Rate For Allowance For Funds Used During Construction

Q77. Why has this statement not been completed?

A77. As a not-for-profit entity, the ISO does not require or request a return on funds used during construction. Accordingly, this statement has not been completed.

Statement AP: Federal Income Tax Deductions - Interest

Q78. Why has this statement not been completed?

A78. As a not-for-profit entity, the ISO does not pay Federal income tax. Accordingly, this statement has not been completed.

<u>Statement AQ: Federal Income Tax Deductions – Other Than Interest</u>

Q79. Why has this statement not been completed?

A79. As a not-for-profit entity, the ISO does not pay Federal income tax. Accordingly, this statement has not been completed.

<u>Statement AR: Federal Tax Adjustments</u>

Q80. Why has this statement not been completed?

A80. As a not-for-profit entity, the ISO does not pay Federal income tax. Accordingly, this statement has not been completed.

<u>Statement AS: Additional State Income Tax Deductions</u>

Q81. Why has this statement not been completed?

A81. The ISO is a not-for-profit entity under both State and Federal law. Accordingly, this statement has not been completed.

<u>Statement AT: State Tax Adjustments</u>

Q82. Why has this statement not been completed?

A82. The ISO is a not-for-profit entity under both State and Federal law. Accordingly, this statement has not been completed.

Statement AU: Revenue Credits

Q83. Please explain the contents of Statement AU, Revenue Credits.

A83. This statement shows all the revenue that the ISO expects to receive in 2004, and that it received in 2002. Revenue credits include "Other Operating Revenues", which are comprised of the following: the Grid Management Charge, Communications Subscriber charges (Telecommunications), WECC security coordinator fees, Scheduling Coordinator application fees, and fines and penalties.

This schedule also shows the net revenue requirement to be collected through the GMC for each service category, and how the operating reserve credit is applied to each service category.

Q84. Since you already have explained the Grid Management Charge, please provide an explanation for the remaining line items included in Statement AU.

A84. The major items on this statement include WECC security coordinator fees and fines and penalties. Below is a description of these items:

<u>WECC Security Coordinator Fees:</u> The ISO acts as a security coordinator for the WECC (formerly Western System Coordinating Council or WSCC). As a security coordinator, it is reimbursed for expenses related to this function.

Fines and Penalties: On December 8, 2000, FERC approved Amendment No. 33 to the ISO Tariff, which allowed the imposition of penalties on participating generators that fail to comply fully with dispatch instructions when the Company is seeking to prevent an imminent or threatened system emergency. During 2000/2001, a total of approximately \$120 million in fines was assessed. Authority to continue levying these fines subsequently was revoked. A total of approximately \$60 million in fines was collected by the ISO. Of that \$60 million, the ISO estimates that approximately \$41 million ultimately will be returned to the parties against which it was levied, due to the ongoing FERC refund proceedings that will have an effect on the energy prices and penalties applied during 2001/2002. The approximately \$19 million in fines that the ISO expected it would be able to keep have been used to reduce the ISO's revenue requirement during 2002 and 2003. No further fines are budgeted for 2004. To the extent that fines of any sort are assessed by the ISO and retained by the ISO, credits would be applied toward the subsequent year's revenue requirement through the operating reserve mechanism.

Statement AV: Rate Of Return

Q85. Please explain the purpose of Statement AV, Rate of Return.

A85. Statement AV shows the actual amount of debt outstanding for Period I and estimated amount to be outstanding for Period II. Outstanding debt consists of Variable Rate

Demand Revenue Bonds ("the Bonds"). The average interest cost is also shown on this statement.

The ISO, as a not-for-profit corporation, does not receive a return on rate base. Instead, debt service costs are recovered through rates. The ISO's capital structure is debt financed. This statement shows the cost of debt for the ISO's year 2000 bond issuance.

Q86. When did the ISO issue the bonds?

A86. In April 2000, the ISO issued $293,000,000 of Variable Rate Demand Revenue Bonds through the California Infrastructure and Economic Development Bank ("CIEBD"). The proceeds of the bonds were used to retire $256,900,000 of Variable Rate Demand Revenue Bonds issued through the California Economic Development Financial Authority ("CEDFA"), a predecessor to CIEDB, with the remainder available to finance the Company's capital expenditures for 2000 and 2001.

Q87. How is repayment of the Bonds guaranteed?

A87. The Bonds are guaranteed by a pledge of the ISO's revenues. Additional credit assurance is provided to bondholders through a standby bond purchase agreement provided by a banking syndicate that can be drawn upon in the event of default of the Bonds, or to reimburse the re-marketing agents who act as dealers for the Bonds. Additionally, as I will discuss below, the Bonds are insured for repayment of principal and interest by MBIA, a firm that provides such bond insurance.

Q88. Please Describe the standby bond purchase agreement.

A88. The original standby agreement expired on April 12, 2001, and the ISO secured three subsequent 364-day extensions, at a cost over three times the original agreement due to the financial uncertainty resulting from the California energy crisis, and to changes in the market for such credit products. The current agreement will expire in April 2004, and will need to be renewed again. As a reflection of the difficulties the ISO has had in obtaining credit with its current "D" credit rating, the lead and agent bank credit provider notified the ISO in May 2003 that it would not be renewing the standby bond purchase agreement in 2004. The ISO will need to identify other providers of this bank liquidity.

Q89. Does the ISO have bond insurance?

A89. Yes. Without such bond insurance, the bonds initially would have required a much higher interest rate for potential investors. In the recent environment, they would have been unmarketable due to credit concerns about the ISO. The bond insurance is effective for the term of the Bonds, and is not subject to cancellation provided that annual insurance payments are made.

Q90. What interest rate do the Bonds bear?

A90. The Bonds bear interest on a weekly rate. Accordingly, the interest rate changes every week. The interest rate forecast for 2004 is the average rate paid on the bonds since issuance to July 2003.

Q91. What other bond-related financial agreements does the ISO have?

A91. The ISO also has entered into a variable to fixed interest rate swap agreement ("Swap") with a financial institution. Under the Swap, the ISO pays the Swap counter-party a fixed rate of 4.82 percent. In return, the counter-party pays the ISO a variable rate interest, at the Bond Market Association ("BMA") Municipal SWAP Index Rate. The BMA swap rate approximates, but does not exactly match, the variable rate of the ISO's bonds. Until the financial crisis that overtook the California energy markets in January 2001, the ISO's bonds yielded approximately 0.4 percent (40 basis points) below the BMA index. During the crisis, ISO bonds yielded 3-4 percent above the BMA index. Recently this premium has fallen, and the yield on ISO bonds is just at about BMA rate.

Q92. What is the term of the swap?

A92. The term of the Swap matches the maturity of the Bonds, and expires in 2008.

Q93. What interest expenses are recorded by the ISO?

A93. Interest expenses include amounts paid on the Bonds, payments and receipts under the Swaps, bond re-marketing costs, and bond insurance and liquidity costs. In addition, amortization of bond issuance costs are shown as Interest Expense on Statement AB.

Q94. Why didn't the ISO issue additional bonds, as planned, in FY2001 AND FY2002?

A94. Due to uncertainties in the California energy market, the ISO's credit rating was downgraded to below investment grade levels by both Standard and Poor's and Moody's credit rating agencies. The ISO, therefore, was not able to issue debt as planned in either of these years. For reasons I explain earlier in my testimony, the ISO has not planned on a bond issuance in 2004.

Statement AW: Cost Of Short-Term Debt

Q95. Why has this statement not been completed?

A95. The ISO did not have short-term debt outstanding in Period I. The ISO does not expect to have short-term debt outstanding in Period II.

Statement AX: Other Recent And Pending Rate Changes

Q96. What is the purpose of this statement?

A96. This statement is intended to document other pending rate changes. The ISO has none at this time.

Statement AY: Income And Revenue Tax Rate Data

Q97. Why has this statement has not been completed?

A97. The ISO is a not-for-profit entity under both State and Federal law. Accordingly, this statement has not been completed.

Statement BA: Wholesale Customer Rate Groups

Q98. Please summarize the contents of Statement BA.

A98. Statement BA provides a description of the service categories that comprise the ISO's Grid Management Charge, both actual and proposed. For Period I, year 2002, the ISO had an unbundled GMC with the following service categories: (1) Control Area Services, (2) Congestion Management, and (3) Ancillary Services and Real Time Energy Operations. For Period II, the proposed GMC categories are changed, and include: (1) Core Reliability Services, (2) Energy Transmission Services (including two subcategories), (3) Forward Scheduling, (4) Congestion Management, (5) Market Usage, and (6) Settlements, Metering, and Client Relations. These categories are described in the testimony of Dr. Barkovich, Exh. No. ISO-1.

It is important to note that these are not customer classes. Customer classes are not used as a basis for setting rates by the ISO. The ISO's customers are primarily Scheduling Coordinators, although some services are provided to non-Scheduling Coordinators, such as Firm Transmission Right holders or entities outside the Control Area. For example, the ISO could purchase power on behalf of its users in an "out of market" transaction. Such a party would pay the "Market Usage" charge on the energy sale to the ISO. Nor does the ISO distinguish between different types of Scheduling Coordinators -- such as power marketers, investor owned utilities, municipal utilities, other governmentally owned utilities, or generators -- for rate making purposes.

Statement BB: Allocation Of Demand And Capability Data

Q99. Why has this statement not been completed?

A99. This statement does not appear to be applicable to the ISO. Billing determinants used in the 2004 rates are set forth on Statement BD.

Statement BC: Reliability Data

Q100. Why has this statement not been completed?

A100. This statement does not appear to be applicable to the ISO. The ISO does not maintain data for generating capacity reserves, and this information is not used in setting the GMC rates.

Statement BD: Allocation Energy And Supporting Data

Q101. Please summarize the contents of Statement BD, Allocation Energy.

A101. Statement BD is a statement of the ISO's billing determinant volumes for Period I and Period II. Period I volumes are the actual monthly volumes experienced in year 2002 for the proposed GMC service categories for 2004. The billing determinant volumes for 2004 are forecast. The basis for the forecasts is described in the testimony of Ms. Yap, Exh. No. ISO-3.

Q102. It appears that Statement BD relates to a utility's wholesale customer groups. Does the ISO have different wholesale customer groups?

A102. While the ISO does not use the concept of "wholesale customer groups" in setting its rates, it does have different GMC service categories. As I discussed above, these categories differ in 2002 and 2004.

Statement BE: Specific Assignment Data

Q103. Why has this statement not been completed?

A103. This statement does not appear relevant to the ISO's rate structure. The results of the cost allocation and assignment process are shown on Statement BK and are discussed by other ISO witnesses.

Statement BF: Exclusive - Use Commitments Of Major Power Supply Facilities

Q104. Why has this statement not been completed?

A104. This statement does not appear to be applicable to the ISO. The ISO does not own any electric utility generation plants or transmission facilities.

Statement BG: Revenue Data To Reflect Changed Rates

Q105. What is the purpose of Statement BG, Revenue Data To Reflect Changed Rates?

A105. For Period II, Statement BG shows the projected billing determinant volumes, rates per unit, and resulting revenues for the ISO's unbundled service categories. This statement demonstrates that the total revenue collected essentially equals the ISO's

2004 revenue requirement. By definition, the ISO's rates are set to cover the revenue requirement. The minor differences result from rounding the rates to three significant digits. For Period I, Statement BG shows monthly billing determinant volumes for FY2002 based on the new 2004 rate structure, the rate that would have been in effect based on those volumes, and resulting pro forma FY2002 revenues.

<u>Statement BH: Revenue Data To Reflect Present Rates</u>

Q106. What is the purpose of Statement BH, Revenue Data To Reflect Present Rates?

A106. For Period II, Statement BH presents the revenue that would be collected assuming a continuation of the current GMC service categories, and no change in rates. This would result in an over-collection, as the ISO proposed revenue requirement has been reduced for 2004. This statement does not provide meaningful information, however, as the rate structure, volumes, and revenue requirement are all different in 2004 from prior years, and it is appropriate that the rates changes to reflect this.

<u>Statement BI: Fuel Cost Adjustment Factors</u>

Q107. Why has this statement not been completed?

A107. This statement is not applicable to the ISO. The ISO does not use fuel cost adjustment factors in setting its GMC rates.

Statement BJ: Summary Data Tables

Q108. Please describe Statement BJ, Summary Data Tables.

A108. Statement BJ is a summary presentation of certain significant values used in the Section 35.13 statements.

Statement BK: Electric Cost Of Service, Total And As Allocated

Q109. Please describe Statement BK, Electric Utility Cost Of Service, Total and as Allocated.

A109. Statement BK is a presentation of cost data that supports the ISO's GMC rates. This statement presents an overview of the methodology for computing the ISO's FY2002 GMC rate, assuming the new FY2004 service categories were in effect, and the proposed GMC rates for FY2004. The statement shows the 2002 rates using the 2004 proposed service categories.

The ISO is a not-for-profit public benefit corporation, and its method of rate-making is different than that of a for-profit entity. As I described earlier, the ISO charges a Grid Management Charge to the Market Participants or Scheduling Coordinators to recover the Company's costs and to provide an operating reserve. The Company's costs recovered in a given year are the projected actual cash spending on O&M costs and debt service costs, and accordingly, the rate calculation excludes non-cash charges such as depreciation and amortization expenses. There is no rate base upon which a return is calculated.

Q110. What are the additional supporting statements you have provided with Statement BK?

A110. Four other statements are provided in support of Statement BK. The first three show the ISO's complete O&M budget and salary/labor costs listed by both FERC account and by ISO cost center, and show the results of the cost allocations into the new GMC service categories. The ISO's cost allocations are derived and documented elsewhere (*see* Exh. No. ISO-10). The final statement shows the calculation of the revenue credit resulting from the ISO's operating reserve. I have discussed the format of this calculation elsewhere in my testimony, but to recap, it shows the operating reserve balances as of December 31, 2002 and December 31, 2003. For December 31, 2002, a reconciliation is shown between the assumptions made in the ISO's previous rate filing (for year 2003) and the actual balances as of that date. For December 31, 2003, the various factors that affect the reserve balance are shown. As 2003 has not been completed, estimated amounts for 2003 are required. To the extent that actual experiences differ from estimates, such differences would be recorded in the subsequent year's calculation.

Statement BL: Rate Design Information

Q111. Please discuss this statement.

A111. Reference is made to documents which provide the information this statement is to contain. The testimony of Dr. Barbara Barkovich (Exh. No. ISO-1) and Ms. Catherine E. Yap (Exh. No. ISO-3) describes the ISO's 2004 rate design.

Statement BM: Construction Program Statement

Q112. Why has this statement not been completed?

A112. This statement is not applicable to the California ISO, which does not have a construction program to replace or expand its power supply.

V. Tariff Changes

Q113. What changes to the ISO Tariff are proposed in this GMC filing?

A113. The Tariff changes proposed in this proceeding are designed to implement the new GMC rate structure for 2004, establish a formula rate, and improve the effectiveness of the quarterly rate adjustment mechanism.

Q114. Will you be discussing the changes necessary to implement the new rate structure and to establish a formula rate?

A114. No. These changes are discussed in the testimony of Ms. Catherine E. Yap (Exh. No. ISO-3), the ISO's rate design consultant.

Q115. Please discuss the changes related to the quarterly rate adjustment.

A115. Appendix F, Schedule 1, Part B of the existing ISO Tariff provides the ISO the ability to adjust GMC rates to reflect changes in billing determinant volumes during the year. This provision provides protection for both the ISO and ratepayers. In setting the rates for a given year, the ISO must forecast billing determinant volumes in

September and October of the previous year. Some of the billing determinants that must be forecast are relatively stable, and the ISO can have a relatively high degree of confidence that actual volumes will match the forecasted volumes closely. For other billing determinants, it is more difficult to attach a high degree of confidence in the forecasts, given more volatile billing determinants, or changes that may be planned for the ISO markets with an uncertain implementation date that will have an effect on such volumes. Particularly for these more difficult to forecast volumes is it important to be able to make a change to rates during the year if actual volumes differ from forecast. Appendix F, Schedule 1, Part B permits the ISO to adjust rates on quarterly basis if, on an annual basis, the ISO expects volumes to differ by more than 5% from the volumes used to set the rates.

Q116. What changes does the ISO propose with respect to this tariff provision?

A116. The ISO is proposing a relatively minor change that will increase the utility of this provision. The provision indicates that rates may change "quarterly". There is an implication here that a change must take place at the start of a calendar quarter, or January 1, April 1, July 1, or October 1. The ISO proposes to clarify that a rate change may be implemented not more than once during a calendar quarter, but that a new rate can commence on the first date of any calendar month within that quarter.

Q117. Why is this change necessary?

A117. The ISO believes requiring a new rate to take effect on a calendar quarter limits the usefulness of this provision. The proposed change would enhance the flexibility of the ISO to adjust rates as necessary in the event of an anticipated change in volumes. A deficiency of the current provision is that it is difficult to use, due to timing issues. First, there is the time required to identify the need for a change, bring the change through the internal review procedure, including ISO Governing Board approval, develop an informational filing for FERC, and file such a notice with adequate notice of a rate change. This is impractical, particularly for April 1, as the ISO typically does not have enough information very early in the year to determine that a change is necessary. There is a lag of at least 45 days for the availability of settlement information, and it is impractical to forecast a year's results based on only the results of the first few weeks of results in a given year. Additionally, the other steps I just noted make this too difficult to achieve for April 1. For a July 1 target, more information is available, but the steps involved in the internal review process still make a July 1 target difficult. Having the flexibility to implement a change at the start of any given calendar month would make the coordination efforts far less complicated, and would increase the practical applicability of this rate change provision.

Q118. Has the ISO used the quarterly adjustment mechanism previously?

A118. The ISO, to date, has not used the existing quarterly adjustment provision of the Tariff. The ISO still would aim to develop as accurate of a forecast as possible, and would not intend to use the improved quarterly adjustment tool unless necessary. Having the adjustment mechanism in place, however, would provide greater assurance that the ISO's collections in a given year would match the revenue requirement. This is of value both to the ISO, to avoid the risk of significant under-collections, and to ratepayers so that current year revenues can be as closely matched to current year ISO costs as possible.

Q119. Does this conclude your testimony?

A119. Yes.

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

County of Sacramento	)
State of California	)

AFFIDAVIT OF WITNESS

I, Philip R. Leiber, being duly sworn, depose and say that the statements and exhibits contained in my Direct Testimony on behalf of the California Independent System Operator Corporation in this proceeding are true and correct to the best of my knowledge, information, and belief.

Philip Leiber

Philip R. Leiber

Subscribed and sworn before
me this 27th day of October, 2003

Virginia B. Davis

Notary Public
State of California

VIRGINIA B. DAVIS
Commission # 1266266
Notary Public - California
Sacramento County
My Comm. Expires Jun 30, 2004

California Independent System Operator
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For the year ended 12/31/2002

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California Independent System Operator
Statement AA
Balance Sheet
December 31, 2002
In Thousands

Line No.	Account Description	Balance at Beginning of Year	Balance at End of Year	Line No.
	Utility Plant			
1	Utility Plant	$232,126	$249,706	1
2	Less: Accumulated Depreciation and Amortization	140,284	185,281	2
3	Net Utility Plant	91,841	64,424	3
	Other Property and Investments			
4	Special Funds	111,542	147,199	4
5	Other Investments	0	24,587	
6	Total Other Property and Investments	111,542	171,785	6
	Current and Accrued Assets			
7	Cash - Unrestricted	129,325	105,518	7
8	Special Deposits	0	28,704	8
9	Customer Accounts Receivable	2,407	476	9
10	Prepayments	1,408	317	10
11	Accrued Utility Revenues	44,848	39,020	11
11.5	Other	275	3,392	11.5
12	Total Current and Accrued Assets	178,263	177,427	12
	Deferred Debits			
13	Unamortized Debt Expense	680	507	13
14	Other	130	(21)	13
15	Total Deferred Debits	811	486	15
16	Total Assets and Other Debits	$382,457	$414,122	16

Notes:
Line 4
ISO Market Related Funds temporarily held pending distribution to market participants.

California Independent System Operator
Statement AA
Balance Sheet
December 31, 2002
In Thousands

Line No.	Account Description	Balance at Beginning of Year	Balance at End of Year	Line No.
	Proprietary Capital			
17	Retained Earnings	($25,574)	($41,167)	17
18	Total Proprietary Capital	(25,574)	(41,167)	18
	Long-Term Debt			
19	Bonds	261,300	228,800	19
20	Notes Payable .	0	0	20
20.5	Other Long Term Debt	6,994	10,788	18.5
21	Net Long-Term Debt	268,294	239,588	21
	Current and Accrued Liabilities			
22	Accounts Payable	28,612	23,853	22
23	Taxes Accrued	181	1,492	23
24	Interest Accrued	0	0	24
24.5	Other	109,698	144,374	
25	Total Current and Accrued Liabilities	138,491	169,720	25
	Deferred Credits & Other Non-Current Liabilities			
26	Other	1,246	45,981	26
	Total Deferred Credits	1,246	45,981	
27	Total Liabilities and Other Credits	$382,457	$414,122	27

Notes:
Other Deferred Credits includes Amendment 33 Fines to be returned

California Independent System Operator
Statement AB
Income Statement
For the Period Ending December 31, 2002
In Thousands

Line No.	Account Description	Total	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmissio n Services Uninstructed Deviations (ETS-UD)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations	Line No.
	Utility Operating Income									
1	Operating Revenues	194,358	$76,508	$48,642	$12,160	$17,483	$13,690	$31,536	($5,662)	1
2	Operating Expenses:									2
3	Operating Expenses	129,957	56,037	17,647	4,412	8,610	3,765	9,837	29,649	3
4	Maintenance Expenses	21,820	8,619	1,643	411	2,329	1,722	3,730	3,367	4
5	Depreciation Expenses	45,682	17,822	4,652	1,163	4,133	2,235	4,822	10,854	5
6	Taxes Other Than Income Taxes	552	243	95	24	19	22	56	93	6
7	Total Utility Operating Expenses	198,010	82,721	24,036	6,009	15,091	7,744	18,445	43,964	7
8	Net Utility Operating Income	(3,652)	(6,213)	24,606	6,151	2,392	5,947	13,091	(49,626)	8
	Other Income and Deductions									
9	Interest Income	2,642	1,031	619	155	239	180	412	7	9
10	Miscellaneous Non-operating Income	139	54	33	8	13	9	22	0	10
11	Miscellaneous Income Deductions	0	0	0	0	0	0	0	0	
12	Total Other income and Deductions	2,781	1,085	651	163	252	190	434	7	
	Interest Charges									
13	Interest on Long-term Debt	10,459	4,080	1,065	266	946	512	1,104	2,485	13
14	Amortization of Debt Discount and Expense (including FAS 133)	3,968	1,548	404	101	359	194	419	943	14
15	Other Interest Expense	296	115	30	8	27	14	31	70	15
16	Total Interest Charges	14,722	5,744	1,499	375	1,332	720	1,554	3,498	16
17	Reallocation of SMCR costs	-	-	(29,666)	(7,416)	-	(4,337)	(11,298)	52,718	
18	Net Income	($15,593)	($10,871)	($5,908)	($1,477)	$1,311	$1,079	$673	($399)	18

Notes:

California ISO calculates its rates using the debt service coverage principle. Depreciation is not used in the calculation. Instead, actual debt service principal and interest costs are recovered through the rate. "Net income" is prior to cash funded capital expenditures, and the difference between debt service and depreciation expense.

Accordingly, this statement is not the basis upon which the GMC rates are calculated.

Lines 3-4: Excludes $4.1 million in internally capitalized O&M costs for capital projects.

Line 14: Includes non-cash item: mark to market of interest rate swap: $3,052. This item excluded from Operating Reserve Calculation.

Line 17: Reallocation of costs from SMCR to other service categories is used to reduce the SMCR charge to $500 per SCID month.

California Independent System Operator
Statement AC
Retained Earnings
For the Period Ending December 31, 2002
In Thousands

Line No.	Account Description	Amount	Line No.
	Unappropriated Retained Earnings		
1	Unappropriated Retained Earnings - Beginning of Year	($25,574)	1
2	Balance Transferred from Income (Account 433)	(15,593)	2
3	Appropriations of Retained Earnings (Account 436)	0	3
4	Unappropriated Retained Earnings - End of Year	($41,167)	4
	Appropriated Retained Earnings		
5	Appropriated Retained Earnings - Beginning of Year	$0	5
6	Increase in Appropriations of Retained Earnings	0	6
7	Decrease in Appropriations of Retained Earnings	0	7
8	Appropriated Retained Earnings - End of Year	$0	8

Note:
As a not-for-profit, public benefit corporation, the California ISO does not have "retained earnings" in the sense that this term is typically used.

California Independent System Operator
Statement AD
Cost of Plant
For the Period Ending December 31, 2002
In Thousands

Line No.	Functional Classification	Average Balance	#	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-UD)	#	Forward Scheduling (FS)	#	Congestion Management (CONG)	#	Market Usage (MU)	#	Settlements, Metering and Client Relations	#	Line No.
1	Transmission	$0		$0	$0	$0		$0		$0		$0		$0		1
2	Intangible	190,130		74,176	19,360	4,840		17,203		9,304		20,070		45,177		2
3	General	50,786		19,813	5,171	1,293		4,595		2,485		5,361		12,067		3
4	Total Plant	$240,916		$93,989	$24,531	$6,133		$21,799		$11,789		$25,431		$57,244		4

		Balance 12/31/01	Balance 12/31/02	Simple Average 1/	
5	Transmission	$0	$0	$0	5
6	Intangible	182,868	197,392	190,130	6
7	General	49,257	52,315	50,786	7
	Total	232,125	249,707	240,916	

1/ Averages for Transmission, Intangibles and General are based on a beginning-of-period, and end-of-period simple average.

California Independent System Operator
Statement AE
Accumulated Depreciation and Amortization
For the Period Ending December 31, 2002
In Thousands

Line No.	Functional Classification	Average Balance	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations	Line No.
1	Transmission	$0	$0	$0	$0	$0	$0	$0	$0	1
2	Intangible	131,217	51,192	13,361	3,340	11,873	6,421	13,851	31,178	2
3	General	31,885	12,439	3,247	812	2,885	1,560	3,366	7,576	3
	Total Accumulated Depreciation and Amortization	$163,101	$63,631	$16,608	$4,152	$14,758	$7,981	$17,217	$38,754	

		Balance		Simple	
		12/31/01	12/31/02	Average 1/	
4	Transmission	$0	$0	$0	4
5	Intangible	110,756	151,677	131,217	5
6	General	29,528	34,242	31,885	6
		140,284	185,919	163,101	

1/ Averages for Accumulated Depreciation and Amortization are based on a beginning-of-period, and end-of-period simple average.

California Independent System Operator
Statement AF
Deferred Credits
For the Period Ending December 31, 2002
In Thousands

Line No.	Account Description	Amount	Line No.
1	Post-retirement Liability	$ 1,492	1
2	Supplemental Executive Retirement Plan Liability	(12)	2
3	Other Deferred Credits	44,502	3
4	Total Deferred Credits	$ 45,981	

Notes:
Other Deferred Credits includes Amendment 33 Fines to be returned

California Independent System Operator
Statement AG
Specified Plant Accounts and Deferred Debits
For the Period Ending December 31, 2002
In Thousands

Line No.	Functional Classification	Balance 12/31/01	Balance 12/31/02	Average 1/ Balance	Line No.
	Account 181 - Unamortized Debt Expense				
1	General	$680	$507	$594	1
2	Total - Specified Plant Accounts and Deferred Debits	$680	$507	$594	2

1/ Averages for Deferred Debits are based on a beginning-of-period, and end-of-period simple average.

California Independent System Operator
Statement AH
Operation and Maintenance Expenses
For the Period Ending December 31, 2002
In Thousands

Line No.	Description	Amount	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-UD)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations (SMCR)	Line No.
1	Transmission	$39,311	$23,363	$8,104	$2,026	$1,332	$1,252	$2,660	$573	1
2	Customer Accounts	7,443	$1,919	$210	$53	$48	$46	$116	$5,050	2
3	Customer Service and Informational	2,360	$3	$0	$0	$0	$0	$0	$2,358	3
4	Administrative and General	102,663	$39,371	$10,975	$2,744	$9,558	$4,188	$10,791	$25,036	4
5	Total	$151,777	$64,656	$19,290	$4,822	$10,938	$5,487	$13,567	$33,017	5

California Independent System Operator
Statement AH
Operation and Maintenance Expenses
For the Period Ending December 31, 2002
In Thousands

Line No.	FERC Account	Description	Amount	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-UD)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations (SMCR)	Line No.
		Transmission Expenses - Operation									
1	560	Operation Supervision and Engineering	$3,490	$2,217	$1,018	$255	$0	$0	$0	$0	1
2	561	Load Dispatching	$24,335	$16,408	$6,391	$1,598	($5)	($4)	($20)	($33)	2
3	566	Miscellaneous Transmission Expenses	$0	$0	$0	$0	$0	$0	$0	$0	3
4		Total Operation	$27,825	$18,625	$7,409	$1,852	($5)	($4)	($20)	($33)	4
		Transmission Expenses - Maintenance									
5	568	Maintenance Supervision and Engineering	$11,486	$4,738	$695	$174	$1,338	$1,256	$2,679	$607	5
6		Total Maintenance	$11,486	$4,738	$695	$174	$1,338	$1,256	$2,679	$607	6
7		Total Transmission Expenses	$39,311	$23,363	$8,104	$2,026	$1,332	$1,252	$2,660	$573	7

California Independent System Operator
Statement AH
Electric Operating and Maintenance Expenses
For the Period Ending December 31, 2002
In Thousands

Line No.	FERC Account	Description	Amount	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-UD)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations (SMCR)	Line No.
		Customer Accounts Expenses - Operation									
8	901	Supervision	$342	$58	$7	$2	$32	$32	$70	$142	8
9	902	Meter Reading Expenses	$2,363	$503	($0)	($0)	$0	$0	$13	$1,847	9
10	903	Customer Record and Collection Expenses	$4,657	$1,358	$204	$51	$16	$14	$34	$2,980	10
11	905	Miscellaneous Customer Accounts Expenses	$81	$0	$0	$0	$0	$0	$0	$81	11
12		Total Customer Accounts Expenses	$7,443	$1,919	$210	$53	$48	$46	$116	$5,050	12
		Customer Service and Informational Expenses - Operation									
13	907	Supervision	$0	$0	$0	$0	$0	$0	$0	$0	13
14	908	Customer Assistance Expenses	$2,360	$3	$0	$0	$0	$0	$0	$2,358	14
15	909	Informational and Instructional Advertising Expenses	$0	$0	$0	$0	$0	$0	$0	$0	15
16		Total Customer Service - Informational Expenses	$2,360	$3	$0	$0	$0	$0	$0	$2,358	16

California Independent System Operator
Statement AH
Electric Operating and Maintenance Expenses
For the Period Ending December 31, 2002
In Thousands

Line No.	FERC Account	Description	Amount	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)		Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations (SMCR)	Line No.
		Administrative and General Expenses - Operation									
17	920	Administrative and General Salaries	$25,619	$8,997	$2,935	$734	$2,190	$1,172	$3,122	$6,469	17
18	921	Office Supplies and Expenses	$5,201	$1,956	$487	$122	$536	$208	$521	$1,371	18
19	923	Outside Services Employed	$13,003	$5,157	$2,034	$508	$630	$731	$1,615	$2,327	19
20	924	Property Insurance	$1,327	$584	$228	$57	$50	$61	$139	$207	20
21	925	Injuries and Damage	$0	$0	$0	$0	$0	$0	$0	$0	21
22	928	Regulatory Commission Expenses	$2,548	$1,122	$439	$110	$96	$118	$266	$398	22
23	930	Miscellaneous General Expenses	$221	$97	$38	$9	$8	$10	$23	$35	23
24	931	Rents	$44,411	$17,577	$3,866	$967	$5,056	$1,423	$4,054	$11,467	24
25		Total Operation	$92,329	$35,490	$10,028	$2,507	$8,567	$3,723	$9,740	$22,275	25
		Administrative and General Expenses - Maintenance									
26	935	Maintenance of General Plant	$10,334	$3,881	$948	$237	$991	$466	$1,051	$2,761	26
27		Total Maintenance	$10,334	$3,881	$948	$237	$991	$466	$1,051	$2,761	27
28		Total Administrative and General Expenses	$102,663	$39,371	$10,975	$2,744	$9,558	$4,188	$10,791	$25,036	28
29		Total Operating and Maintenance Expenses	$151,777	$64,656	$19,290	$4,822	$10,938	$5,487	$13,567	$33,017	29

California Independent System Operator
Statement AH
Operation and Maintenance Expenses
Itemization of Miscellaneous General Expenses - Account 930.2
For the Period Ending December 31, 2002
In Thousands

Line No.	FERC Account	Description	Total	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-UD)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations (SMCR)	Line No.
1	930	Recruiting/ Advertising	$26	$11	$4	$1	$1	$1	$3	$4	1
2		Total	$26	$11	$4	$1	$1	$1	$3	$4	2

California Independent System Operator
Statement AH
Operation and Maintenance Expenses
Itemization of Miscellaneous General Expenses - Account 930.2
For the Period Ending December 31, 2002
In Thousands

Line No.	FERC Account	Description	Total	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-UD)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations (SMCR)	Line No.
1	930	Board Compensation and Expen	$92	$40	$16	$4	$3	$4	$10	$14	1
2		Total	$92	$40	$16	$4	$3	$4	$10	$14	2

California Independent System Operator
Statement AH
Operation and Maintenance Expenses
Itemization of Miscellaneous General Expenses - Account 930.2
For the Period Ending December 31, 2002
In Thousands

Line No.	FERC Account	Description	Total	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-UD)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations (SMCR)	Line No.
1	930	Bank Service Fees	$99	$45	$18		$4	$5	$11	$16	1
2		Total	$99	$45	$18		$4	$5	$11	$16	2

California Independent System Operator
Statement AI
Wages and Salaries
For the Period Ending December 31, 2002
In Thousands

Line No.	Description	Amount	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-	Forward Scheduling (FS)	Congestion Management (CONG)	#	Market Usage (MU)	#	Settlements, Metering and Client Relations		No.
1	Transmission	$32,439	$19,723	$6,789	$1,697	$987	$905		$1,890		$449	#	1
2	Customer Accounts	6,414	1,659	192	48	45	43		110		4,315		2
3	Customer Service and Informational	2,073	3	0	0	0	0		0		2,071		3
4	Administrative and General	25,611	8,994	2,935	734	2,189	1,172		3,122		6,467		4
5	Total	$66,538	$30,379	$9,916	$2,479	$3,221	$2,120		$5,122		$13,302		5

Note:

$66,538K differs from FERC Form 1 total Wages and Salaries of $70,649K. $4,111K difference is due to capitalized labor on capital projects.

California Independent System Operator
Statement AI
Wages and Salaries
For the Period Ending December 31, 2002
In Thousands

Line No.	FERC Account	Description	Amount	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations	Line No.
		Transmission Expenses - Operation									
1	560	Operation Supervision and Engineering	$2,461	$1,560	$721	$180	$0	$0	$0	$0	1
2	561	Load Dispatching	$21,306	$14,460	$5,546	$1,387	($9)	($7)	($27)	($44)	2
3	566	Miscellaneous Transmission Expenses	$0	$0	$0	$0	$0	$0	$0	$0	3
4		Total Operation	$23,767	$16,020	$6,267	$1,567	($9)	($7)	($27)	($44)	4
		Transmission Expenses - Maintenance									
5	568	Maintenance Supervision and Engineering	$8,672	$3,702	$522	$130	$996	$912	$1,917	$493	5
6		Total Maintenance	$8,672	$3,702	$522	$130	$996	$912	$1,917	$493	6
7		Total Transmission Salary Expenses	$32,439	$19,723	$6,789	$1,697	$987	$905	$1,890	$449	7

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California Independent System Operator
Statement AI
Electric Wages and Salaries
For the Period Ending December 31, 2002
In Thousands

Line No.	FERC Account	Description	Amount	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-UD)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations	Line No.
		Customer Accounts Expenses - Operation									
8	901	Supervision	$317	$54	$6	$2	$30	$30	$65	$131	8
9	902	Meter Reading Expenses	$1,781	$378	($0)	($0)	$0	$0	$13	$1,390	9
10	903	Customer Record and Collection Expenses	$4,254	$1,227	$186	$47	$16	$14	$33	$2,731	10
11	905	Miscellaneous Customer Accounts Expenses	$62	$0	$0	$0	$0	$0	$0	$62	11
12		Total Customer Accounts Expenses	$6,414	$1,659	$192	$48	$45	$43	$110	$4,315	12
		Customer Service and Informational Expenses - Operation									
13	907	Supervision	$0	$0	$0	$0	$0	$0	$0	$0	13
14	908	Customer Assistance Expenses	$2,073	$3	$0	$0	$0	$0	$0	$2,071	14
15		Total Customer Service - Informational Expenses	$2,073	$3	$0	$0	$0	$0	$0	$2,071	15

California Independent System Operator
Statement AI
Wages and Salaries
For the Period Ending December 31, 2002
In Thousands

Line No.	FERC Account	Description	Amount	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-UD)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations	Line No.
		Administrative and General Expenses - Operation									
16	920	Administrative and General Salaries	$25,617	$8,996	$2,935	$734	$2,189	$1,172	$3,122	$6,468	16
17	921	Office Supplies and Expenses	($6)	($2)	($1)	($0)	($1)	($0)	($1)	($1)	17
18		Total Operation	$25,611	$8,994	$2,935	$734	$2,189	$1,172	$3,122	$6,467	18
		Administrative and General Expenses - Maintenance									
19	935	Maintenance of General Plant	$0	$0	$0	$0	$0	$0	$0	$0	19
20		Total Maintenance	$0	$0	$0	$0	$0	$0	$0	$0	20
21		Total Administrative and General Salary Expenses	$25,611	$8,994	$2,935	$734	$2,189	$1,172	$3,122	$6,467	21
22		Total Operating and Maintenance Salary Expenses	$66,538	$30,379	$9,916	$2,479	$3,221	$2,120	$5,122	$13,302	22

California Independent System Operator
Statement AJ
Depreciation and Amortization Expenses
For the Period Ending December 31, 2002
In Thousands

Line No.	Functional Classification	2002 Average Depreciable Cost of Plant	Annual Depreciation Rate	Amount of Expense	Core Reliability Services (CRS) #	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS UD) #	Forward Scheduling (FS) #	Congestion Management (CONG) #	Market Usage (MU) #	Settlements, Metering and Client Relations	Line No.
1	Transmission	$0	0.00%	$0	$0	$0	$0	$0	$0	$0	$0	1
2	General	50,786	4.10%	2,083	813	212	53	189	102	220	495	2
3	Intangibles	190,130	22.93%	43,598	17,009	4,439	1,110	3,945	2,133	4,602	10,359	3
4	Total	$240,916		$45,682	$17,822	$4,652	$1,163	$4,133	$2,235	$4,822	$10,854	4

California Independent System Operator
Statement AK
Taxes Other Than Income Taxes
For the Period Ending December 31, 2002
In Thousands

Line No.	Account Description	Total	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Transmission Services Uninstructed Deviations (ETS-UD)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations	Line No.
1	Property Taxes	552	243	95	24	19	22	56 #	93	1
2	Total Taxes Other Than Income Taxes	$552	$243	$95	$24	$19	$22	$56	$93	2
	Employer Payroll Taxes									
3	FICA	$2,635								3
4	Medicare	787								4
5	California Unemployment Tax	101								5
6	California Employee Training Tax	2								6
7	Dist. Of Col. Unemployment Tax	0								7
8	Total Taxes	$3,525								8

California Independent System Operator
Statement AL
Working Capital
For the Period Ending December 31, 2002
In Thousands

Line No.	Month/Year	Average Working Cash	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-UD)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations	Line No.
1	December-01	$62,710	$24,465	$6,385	$1,596	$5,674	$3,069	$6,620	$14,901	1
2	January-02	27,815	$10,851	$2,832	$708	$2,517	$1,361	$2,936	$6,609	2
3	February-02	24,721	$9,645	$2,517	$629	$2,237	$1,210	$2,610	$5,874	3
4	March-02	24,078	$9,393	$2,452	$613	$2,179	$1,178	$2,542	$5,721	4
5	April-02	24,732	$9,649	$2,518	$630	$2,238	$1,210	$2,611	$5,877	5
6	May-02	24,514	$9,564	$2,496	$624	$2,218	$1,200	$2,588	$5,825	6
7	June-02	24,185	$9,435	$2,463	$616	$2,188	$1,183	$2,553	$5,747	7
8	July-02	24,764	$9,661	$2,522	$630	$2,241	$1,212	$2,614	$5,884	8
9	August-02	26,356	$10,282	$2,684	$671	$2,385	$1,290	$2,782	$6,262	9
10	September-02	26,885	$10,489	$2,738	$684	$2,433	$1,316	$2,838	$6,388	10
11	October-02	27,833	$10,858	$2,834	$709	$2,518	$1,362	$2,938	$6,613	11
12	November-02	29,352	$11,451	$2,989	$747	$2,656	$1,436	$3,098	$6,974	12
13	December-02	29,184	$11,386	$2,972	$743	$2,641	$1,428	$3,081	$6,934	13
14	13-Month Total	$377,128	$147,130	$38,401	$9,600	$34,123	$18,455	$39,809	$89,609	14
15	13-Month Average	$29,010	$11,318	$2,954	$738	$2,625	$1,420	$3,062	$6,893	15

Note:
Average working cash approximates ISO Operating Reserve balance.

California Independent System Operator
Statement AM
Construction Work in Process
For the Period Ending December 31, 2002
In Thousands

Line No.	Functional Classification	Average Balance	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS UD)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations	Line No.
1	Transmission	$0	$0	$0	$0	$0	$0	$0	$0	1
2	Intangible	17,069	$6,659	$1,738	$435	$1,544	$835	$1,802	$4,056	2
3	General	4,267	$1,665	$435	$109	$386	$209	$450	$1,014	3
4	Total Plant	21,337	$8,324	$2,173	$543	$1,931	$1,044	$2,252	$5,070	4

Line No.		Balance 12/31/01	Balance 12/31/02	Simple Average 1/	Line No.
5	Intangible	15,536	18,602	17,069	5
6	General	3,884	4,651	4,267	6
	Total	19,420	23,253		

1/ Averages for Construction Work in Process are based on a beginning-of-period, and end-of-period simple average.

California Independent System Operator
Statement AN
Notes Payable
For the Period Ending December 31, 2002
In Thousands

Line No.	Date		Amount	Line No.
1	01/01/02		$0	1
2	01/31/02		0	2
3	02/28/02		0	3
4	03/31/02		0	4
5	04/30/02		0	5
6	05/31/02		0	6
7	06/30/02		0	7
8	07/31/02		0	8
9	08/31/02		0	9
10	09/30/02		0	10
11	10/31/02		0	11
12	11/30/02		0	12
13	12/31/02		0	13
14		Total	$0	14
15		Average Balance	$0	15

California Independent System Operator
Statement AO
Rate for Allowance for Funds Used During Construction
12/31/02

This Statement was not prepared because the ISO does not intend to request a return on funds used during construction.

California Independent System Operator
Statement AP
Federal Income Tax Deductions - Interest
12/31/02

This Statement was not prepared because the ISO is tax-exempt under section 501(c)(3) of the Internal Revenue Code.

California Independent System Operator
Statement AQ
Federal Income Tax Deductions - Other than Interest
12/31/02

This Statement was not prepared because the ISO is tax-exempt under section 501(c)(3) of the Internal Revenue Code.

California Independent System Operator
Statement AR
Federal Tax Adjustments
12/31/02

This Statement was not prepared because the ISO is tax-exempt under section 501(c)(3) of the Internal Revenue Code.

California Independent System Operator
Statement AS
Additional State Income Tax Deduction
12/31/02

This Statement was not prepared because the ISO is tax-exempt under section 501(c)(3) of the Internal Revenue Code.

California Independent System Operator
Statement AT
State Tax Adjustments
12/31/02

This Statement was not prepared because the ISO is tax-exempt under section 501(c)(3) of the Internal Revenue Code.

California Independent System Operator
Statement AU
Revenue Credits
For the Period Ending December 31, 2002
In Thousands

Line No.	FERC Account	Description	Amount	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS UD)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations (SMCR)	Line No.
1	456	Other Operating Revenue									1
2		Grid Management Charge	219,014	85,445	51,268	12,817	19,817	14,953	34,259	455	2
3		Communications Subscriber Charges	0	-	-	-	-	-	-	-	3
4		WSCC Security Coordinator Fees	1,127	1,127							4
5		SC Application Fees	12							12	5
6		Fines and Penalties (including interest payable)	(25,794)	(10,063)	(2,626)	(657)	(2,334)	(1,262)	(2,723)	(6,129)	6
7		Total Operating Revenue (Account 456)	194,358	76,508	$48,642	$12,160	$17,483	$13,690	$31,536	($5,662)	7
8		Total Revenue Credits	194,358	76,508	48,642	12,160	17,483	13,690	31,536	(5,662)	8
9	419, 421, 431	Interest & Other Income									9
11		Interest and Dividend Income	2,469	963	578	145	223	169	385	6	11
12		Interest Inc on Bond Funds	173	68	41	10	16	12	27	0	12
13		Gains on Investments	24	9	6	1	2	2	4	0	13
14		Miscellaneous Non-Oper Income	115	45	27	7	10	8	18	0	14
15		Arbitrage Rebate Lbty Exp	0	0	0	0	0	0	0	0	15
16		Total Interest & Other Income	2,781	1,085	$651	$163	$252	$190	$434	$7	16

Note:
Fines and penalties were applied to the Operating Reserve using an approach that differs from that above.
Interest & Other Income was applied to these pro-forma GMC service categories on a pro-rata basis.

Assumes that 2004 GMC rate categories were in effect during 2002.
Actual 2002 GMC collections were for service categories in effect during 2002:
- Control Area Services
- Congestion Management
- Ancillary Services and Real Time Energy Operations

California Independent System Operator
Statement AV
Rate of Return
For the Period Ending December 31, 2002
In Thousands

Line No.	Component	Capitalization Amount	Capitalization Ratio	Component Cost	Weighted Component Cost	Line No.
1	Long-Term Debt	$228,800	100%	5.89%	5.89%	1

Long Term Debt Reconciliation:

Debt Outstanding at 1/1/2002:	261,300
Debt Retired During 2002:	(32,500)
Debt Issued During 2002:	-
Total Debt Outstanding 12/31/2002:	228,800

Average capital cost noted above is calculated by dividing interest expense by average outstanding debt.

California Independent System Operator
Statement AW
Cost of Short-Term Debt
For the Period Ending December 31, 2002
In Thousands

Line No.	Type of Short-term Financing	Balance End of Year 12/31/02	Interest Rate	Interest Charges on an Annual Basis	Line No.
1	Line of Credit	$0	N/A	0	1
2	Total, All Short-Term Debt	$0	N/A	0	2

Note:
The ISO did not incurr short-term debt costs in 2002.

California Independent System Operator
Statement AX
Other Recent and Pending Rate Changes
For the Period Ending December 31, 2002

The ISO's filed rates for 2002 were later modified with a settlement agreement between the ISO and its ratepayers.

These revised rates, and refunds related to the difference between filed and settlement rates were issued in February 2003.

New rates were established for 2003.

California Independent System Operator
Statement AY
Income and Revenue Tax Rate Data
For the Period Ending December 31, 2002

This Statement was not prepared because the ISO is tax-exempt under section 501(c)(3) of the Internal Revenue Code.

California Independent System Operator
Statement BA
Wholesale Customer Rate Groups

Control Area Services	This category is responsible for managing the Control Area and the ISO Controlled Grid to "keep the lights on," i.e., ensure safe, reliable operation of the transmission grid and dispatch of bulk power supplies in accordance with regional and national reliability standards, including, but not limited to: · performing operation studies; · system security analyses; · transmission maintenance standards; · system planning to ensure overall reliability; · integration with other Control Areas; · emergency management; · outage coordination; · transmission planning; and · scheduling generation, imports, exports, and wheeling in the Day-Ahead and Hour-Ahead of actual operations.
Congestion Management	Provides for the administration of Congestion management. Congestion exists when power flowing on a transmission path exceeds the transmission path capacity. Congestion management is conducted by the ISO during the scheduling process and results in the economic rationing of transmission service in order to prevent congestion. Currently provides for only interzonal congestion.
Ancillary Services and Real Time Energy Operations	Provides for ancillary service and real-time energy related services, including, but not limited to: providing open and non-discriminatory access for market making activities for participants through Ancillary Services auctions and Energy balancing services, Posting of market information; Market surveillance and analysis; Settlement, billing, and metering related to the above;

Notes and Assumptions:
The above are not wholesale customer rate groups per se, but are the categories of service provided by the California ISO during 2002.

The Period I statements in this filing for 2002 assume that the new GMC service categories proposed for 2004 were in effect during 2002. See Statement BA in for Period II (12/31/2004) for descriptions of the 2004 GMC service categories.

California Independent System Operator
Statement BB
Allocation of Demand and Capability Data

The California ISO does not allocate costs to wholesale services based on allocation demand and capability data. Services are allocated based on energy data which is provided in Statement BD.

California Independent System Operator
Statement BC
Reliability Data

The California ISO does not maintain data for generating capacity reserves.

California Independent System Operator
Statement BD
Allocation of Energy and Supporting Data

Line No.		Period I: Actual — Billable Quantities (MWh)						
		Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-UD)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations (SMCR)
1	Jan	39,650	19,762,706	1,271,309	966,442	7,221,308	3,756,413	70
2	Feb	38,248	17,493,126	911,266	928,685	6,452,561	3,157,194	73
3	Mar	36,879	19,145,884	967,145	1,031,549	6,782,106	3,484,324	74
4	Apr	37,773	18,565,485	1,149,512	1,007,846	7,634,142	3,439,526	72
5	May	43,702	19,894,564	1,303,706	1,077,546	7,146,983	3,703,240	73
6	Jun	50,740	21,410,086	1,528,504	1,068,867	8,391,100	3,996,023	75
7	Jul	54,466	23,927,916	1,695,332	1,141,240	9,468,986	4,092,762	78
8	Aug	50,045	23,089,531	1,634,715	1,133,562	8,657,460	3,744,858	76
9	Sep	50,475	21,611,036	1,682,331	1,135,685	8,016,125	3,804,609	75
10	Oct	41,971	19,684,915	1,308,466	1,158,201	7,396,523	3,012,013	72
11	Nov	41,102	18,988,767	1,663,907	1,097,196	7,271,549	3,388,105	82
12	Dec	39,870	20,025,912	1,606,764	1,105,911	7,094,691	3,467,227	90
13	Total	524,920	243,599,928	16,722,959	12,852,730	91,533,535	43,046,293	910
14	Average	43,743	20,299,994	1,393,580	1,071,061	7,627,795	3,587,191	76

Notes:
These billing determinant quantities were gathered from ISO systems and relate to information for 2002.
However, these billing determinants were not the basis for the GMC assessments in 2002, as a different rate structure was in effect at that time.

California Independent System Operator
Statement BE
Specific Assignment Data

See Statement BK for the results of the allocation of ISO costs into GMC service categories.

California Independent System Operator
Statement BF
Exclusive Use Commitments of Major Power Supply Facilities

This statement is not applicable to the California ISO. It owns no generation and has no exclusive use commitments.

California Independent System Operator
Statement BG
Revenue Data to Reflect Changed Rates

N/A for Period I

California Independent System Operator
Statement BH
Revenue Data to Reflect Present Rates

completed 9/2003

Period I Billable Quantities (MWh)

Line No.		Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-UD)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations (SMCR)
1	Jan	39,650	19,762,706	1,271,309	966,442	7,221,308	3,756,413	70
2	Feb	38,248	17,493,126	911,266	928,685	6,452,561	3,157,194	73
3	Mar	36,879	19,145,884	967,145	1,031,549	6,782,106	3,484,324	74
4	Apr	37,773	18,565,485	1,149,512	1,007,846	7,634,142	3,439,526	72
5	May	43,702	19,894,564	1,303,706	1,077,546	7,146,983	3,703,240	73
6	Jun	50,740	21,410,086	1,528,504	1,068,867	8,391,100	3,996,023	75
7	Jul	54,466	23,927,916	1,695,332	1,141,240	9,468,986	4,092,762	78
8	Aug	50,045	23,089,531	1,634,715	1,133,562	8,657,460	3,744,858	76
9	Sep	50,475	21,611,036	1,682,331	1,135,685	8,016,125	3,804,609	75
10	Oct	41,971	19,684,915	1,308,466	1,158,201	7,396,523	3,012,013	72
11	Nov	41,102	18,988,767	1,663,907	1,097,196	7,271,549	3,388,105	82
12	Dec	39,870	20,025,912	1,606,764	1,105,911	7,094,691	3,467,227	90
13	Total	524,920	243,599,928	16,722,959	12,852,730	91,533,535	43,046,293	910

Period I Revenues $

Line No.		Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-UD)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations (SMCR)	Total
	Rate $/MWh	$ 162.78	$ 0.21	$ 0.77	$ 1.54	$ 0.16	$ 0.80	$ 500.00	
1	Jan	$ 6,454,094	$ 4,159,279	$ 974,376	$ 1,490,094	$ 1,179,653	$ 2,989,606	$ 35,000	$ 17,282,103
2	Feb	$ 6,225,791	$ 3,681,621	$ 698,427	$ 1,431,879	$ 1,054,073	$ 2,512,708	$ 36,500	15,640,998
3	Mar	$ 6,002,969	$ 4,029,462	$ 741,255	$ 1,590,478	$ 1,107,906	$ 2,773,059	$ 37,000	16,282,130
4	Apr	$ 6,148,583	$ 3,907,310	$ 881,027	$ 1,553,932	$ 1,247,092	$ 2,737,407	$ 36,000	16,511,351
5	May	$ 7,113,618	$ 4,187,030	$ 999,207	$ 1,661,398	$ 1,167,512	$ 2,947,288	$ 36,500	18,112,552
6	Jun	$ 8,259,238	$ 4,505,988	$ 1,171,500	$ 1,648,017	$ 1,370,747	$ 3,180,304	$ 37,500	20,173,294
7	Jul	$ 8,865,827	$ 5,035,893	$ 1,299,362	$ 1,759,604	$ 1,546,828	$ 3,257,296	$ 39,000	21,803,810
8	Aug	$ 8,146,089	$ 4,859,446	$ 1,252,904	$ 1,747,766	$ 1,414,259	$ 2,980,410	$ 38,000	20,438,874
9	Sep	$ 8,216,200	$ 4,548,280	$ 1,289,399	$ 1,751,039	$ 1,309,492	$ 3,027,964	$ 37,500	20,179,875
10	Oct	$ 6,831,875	$ 4,142,907	$ 1,002,855	$ 1,785,755	$ 1,208,276	$ 2,397,163	$ 36,000	17,404,830
11	Nov	$ 6,690,404	$ 3,996,395	$ 1,275,278	$ 1,691,695	$ 1,187,860	$ 2,696,482	$ 41,000	17,579,115
12	Dec	$ 6,489,836	$ 4,214,674	$ 1,231,481	$ 1,705,132	$ 1,158,969	$ 2,759,453	$ 45,000	17,604,545
13	Total	$ 85,444,525	$ 51,268,285	$12,817,071	$19,816,789	$ 14,952,666	$ 34,259,140	$ 455,000	$ 219,013,477
14	2002 Revenue Requirement (actual costs)	$85,444,525	$51,268,285	$12,817,071	$19,816,789	$14,952,666	$34,259,140	$455,000	$219,013,476
15	Difference	$ -	$ -	$ -	$ -	$ -	$ -	$ 0	$ 0

Note:
This statement assumes that the rate categories proposed for 2004 were in effect during 2002.
It also assumes that the rates that would have been in effect were based on the actual billing determinant quantifies shown in the table above.

California Independent System Operator
Statement BJ
Summary Data Tables
For the Period Ending December 31, 2002
In Thousands

Line No.	Item	Total	Table	Data Source	Line No.
1	Total Plant in Service				1
2	Intangible Plant in Service	$190,130		AD	2
3	General Plant in Service	$50,786		AD	3
4	Accumulated Depreciation and Amortization				4
5	Intangible Depreciation and Amortization	$131,217		AE	5
6	General Depreciation and Amortization	$31,885		AE	6
7	Total Deferred Credits	$45,981		AF	7
8	Unamortized Debt Expense	$594		AG	8
9	Transmission Expense- O&M	$39,311		AH	9
10	Customer Accounts Expense	$7,443		AH	10
11	Customer Service & Information Expense	$2,360		AH	11
12	Administration & General Expense	$102,663		AH	12
13	Transmission Expense- Labor	$32,439		AI	13
14	Customer Accounts Expense - Labor	6,414		AI	14
15	Customer Service & Information Expense - Labor	2,073		AI	15
16	Administration & General Expense - Labor	25,611		AI	16
17	Transmission - Depreciation Expense	0		AJ	17
18	General - Depreciation Expense	2,083		AJ	18
19	Intangibles - Depreciation Expense	43,598		AJ	19
20	Taxes Other Than Income Taxes	552		AK	20
21	Employer Payroll Tax	3,525		AK	21
22	Working Capital: Average	$29,010		AL	22
23	Construction Work In Progress- Average- Total	21,337		AM	23
24	Notes Payable - Average	$0		AN	24
25	Fed Income Tax Deductions - Interest	N/A		AP	25
26	Fed Income Tax Deductions - Other than Interest	N/A		AQ	26
27	Fed Income Tax Adjustments	N/A		AR	27
28	Additional State Income Tax Deduction	N/A		AS	28
29	State Tax Adjustments	N/A		AT	29
30	Other Operating Revenues	$194,358		AU	30
31	Cost of Capital	5.89%		AV	31
32	Cost of Short Term Debt	$0		AW	32
33	Allocation of Demand and Capability Data	N/A		BB	33
34	Allocation of Energy and Supporting Data: Billing Determinant in MWh				34
35	Core Reliability	525		BD	35
36	Energy & Transmission Services- Grid Load	243,600		BD	36
37	Energy & Transmission Services- Deviations	16,723		BD	37
38	Forward Scheduling	12,853		BD	38
39	Congestion Management	525		BD	39
40	Market Usage	91,534		BD	40
41	Settlements, Metering and Client Relations	0.910		BD	41
42	Specific Assignment Data	N/A		BE	42
51	Revenue Data to Reflect Existing Rates			BH	51
52	Core Reliability	$ 85,445		BH	52
53	Energy & Transmission Services- Grid Load	51,268		BH	53
54	Energy & Transmission Services- Deviations	12,817		BH	54
55	Forward Scheduling	19,817		BH	55
56	Congestion Management	14,953		BH	56
57	Market Usage	34,259		BH	57
58	Settlements, Metering and Client Relations	455		BH	58

California Independent System Operator

Statement BK

Electric Utility Department Cost of Service, Total and as Allocated
For the Period Ending December 31, 2002
In Thousands

Line No.	Description	Amount	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-UD)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations (SMCR)	Line No.
1	Grid Management Charge Revenue Collected (Statement AU)	$219,014	$85,445	$51,268	$12,817	$19,817	$14,953	$34,259	$455	1
2	Operating Expenses									2
3	Transmission (Statement AH)	$39,311	$23,363	$8,104	$2,026	$1,332	$1,252	$2,660	$573	3
4	Customer Accounts (Statement AH)	$7,443	$1,919	$210	$53	$48	$46	$116	$5,050	4
5	Customer Service and Informational Expenses (Statement AH)	$2,360	$3	$0	$0	$0	$0	$0	$2,358	5
6	Administrative and General (Statement AH)	$102,663	$39,371	$10,975	$2,744	$9,558	$4,188	$10,791	$25,036	6
7	Taxes Other Than Income Taxes (Statement AK)	$552	$243	$95	$24	$19	$22	$56	$93	7
8	Total Operating Expenses	$152,328	$64,899	$19,384	$4,846	$10,958	$5,508	$13,623	$33,109	8
9	Less: Other Revenues									9
10	Interest Earnings (Statement AU)	$ 2,781	$ 1,085	$ 651	$ 163	$ 252	$ 190	$ 434	$ 7	10
11	Other Earnings (Statement AU)	(24,656)	(8,936)	(2,626)	(657)	(2,334)	(1,262)	(2,723)	(6,117)	11
12		($21,874)	($7,851)	($1,975)	($494)	($2,082)	($1,072)	($2,289)	($6,110)	12
13	Net Operating Expenses	$174,203	$72,750	$21,360	$5,340	$13,040	$6,581	$15,912	$39,220	13
14	Net Revenues	$44,811	$12,695	$29,908	$7,477	$6,777	$8,372	$18,347	($38,765)	14
15	Less: Debt Service and Cash Funded CapEx (Statement BK)									15
16	Principal Reserve Funding	$33,367	$ 13,018	$ 3,398	$ 849	$ 3,019	$ 1,633	$ 3,522	$ 7,928	16
17	Interest Reserve Funding	10,459	$ 4,080	$ 1,065	$ 266	$ 946	$ 512	$ 1,104	$ 2,485	17
18	Cash Funded CapEx	$22,417	$ 8,746	$ 2,283	$ 571	$ 2,028	$ 1,097	$ 2,366	$ 5,327	18
19	Total Debt Service and Cash Funded CapEx	$66,243	$25,843	$6,745	$1,686	$5,994	$3,242	$6,993	$15,740	19
20	Less: Non-Cash Items (Statement AU)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
21	Subtotal: Costs Prior to Reallocation (excluding Line 11)	(21,432)	(13,149)	23,163	5,791	783	5,130	11,354	(54,505)	
22	Reallocation of Settlements, Metering, Client Relations Costs	0	0	(29,666)	(7,416)	-	(4,337)	(11,298)	52,718	
23	Operating Reserve Contribution	($21,432)	($13,149)	($6,503)	($1,626)	$783	$793	$56	($1,787)	23
24	GMC Revenue Collected	$219,014	$85,445	$51,268	$12,817	$19,817	$14,953	$34,259	$455	24
25	2002 Annual Volume (000 MWh) - By Service		525	243,600	16,723	12,853	91,534	43,046	910	25
26	Grid Management Charge - By Service		$162.776	$0.210	$0.766	$1.542	$0.163	$0.796	$0.500	26

Note:
The factors used to allocate ISO costs to the categories of service are those developed for 2004 costs.

Line 21
This amount differs from the reserve contribution used in calculation of Operating Reserve credit for 2003, as this schedule shows actual overall figures for 2002, rather than estimated information that was available at the time of the 2003 rate filing.

Line 22
Cost are reallocated from Settlements, Metering & Client Relations based on 2004 reallocation factors.

Line 23
Amount differs from Operating Reserve Calculation shown in Statement BK4 for the following reasons:

		Reported on Form 1 and on these schedules	Per Operating Reserve Forecast	Difference	Description
27	Revenue	$219,014	224,470	$5,456	Post Audit Adjustments: Including potential refund classified in line 32 below, and previous year reduction.
28	Operating Expenses	($152,328)	(156,438)	($4,110)	Internal ISO labor capitalized for GAAP financials and Form 1, included in O&M for rate purposes.
29	Items not known at date of Form 1				
30	2001 GMC Case Refunds per 5/2/2003 FERC Order (related to 200	0	(1,800)	($1,800)	Not included in 2002 Financial statements, but affects 12/31/2002 operating reserve
31	Matters Pending Dispute Resolution, Litigation or Appeal including ir	0	(17,626)	($17,626)	Not included in 2002 Financial statements, but affects 12/31/2002 operating reserve.
32	Interest on 2001 GMC Case Refunds per 5/2/2003 FERC Order (rel	0	(122)	($122)	Not included in 2002 Financial statements, but affects 12/31/2002 operating reserve
33	Other Unreconciled Differences			182	
34	Net Differences			($18,020)	
35	Operating Reserve Contribution per Schedule BK_4			(39,452)	

California Independent System Operator
Support for Cost Allocations by ISO Cost Center: Total Costs
For Year Ended December 31, 2002

Center	FERC Code	Actual 2002	Core Reliability Services (CRS) Allocation	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-UD) Allocation Percentage	Forward Scheduling (FS) Allocation Percentage	Congestion Management (CONG) Allocation Percentage	Market Usage (MU) Allocation Percentage	Settlements, Metering and Client Relations (SMCR) Allocation Percentage	Core Reliability Services (CRS) dollars	Energy Transmission Services Net Energy (ETS-NE) dollars	Energy Transmission Services Uninstructed Deviations dollars	Forward Scheduling (FS) dollars	Congestion Management (CONG) dollars	Market Usage (MU) dollars	Settlements, Metering and Client Relations (SMCR) dollars	Total
1351	408	550,010	44%	17%	4%	4%	4%	10%	17%	242,354	94,479	23,620	19,320	21,618	56,135	92,483	550,010
1311	408	1,641	44%	17%	4%	4%	4%	10%	16%	723	282	71	59	69	169	268	1,641
1511	560	849,899	67%	27%	7%	0%	0%	0%	0%	566,933	226,373	56,593	-	-	-	-	849,899
1521	560	2,640,210	63%	30%	8%	0%	0%	0%	0%	1,650,131	792,063	198,016	-	-	-	-	2,640,210
1565	561	1,599,060	77%	18%	5%	0%	0%	0%	0%	1,230,046	295,211	73,803	-	-	-	-	1,599,060
1752	561	24,215	27%	4%	1%	27%	22%	18%	0%	6,612	1,058	264	6,612	5,290	4,379	-	24,215
1566	561	501,820	100%	0%	0%	0%	0%	0%	0%	501,820	-	-	-	-	-	-	501,820
1564	561	230,436	100%	0%	0%	0%	0%	0%	0%	230,436	-	-	-	-	-	-	230,436
1563	561	419,371	75%	20%	5%	0%	0%	0%	0%	312,654	85,374	21,344	-	-	-	-	419,371
1562	561	1,092,865	55%	36%	9%	0%	0%	0%	0%	602,667	392,158	98,040	-	-	-	-	1,092,865
1561	561	1,157,699	65%	28%	7%	0%	0%	0%	0%	756,262	321,150	80,287	-	-	-	-	1,157,699
1559	561	394,785	60%	32%	8%	0%	0%	0%	0%	236,871	126,331	31,583	-	-	-	-	394,785
1558	561	50,894	58%	33%	8%	0%	0%	0%	0%	29,750	16,915	4,229	-	-	-	-	50,894
1555	561	1,031,800	56%	36%	9%	0%	0%	0%	0%	573,222	366,862	91,716	-	-	-	-	1,031,800
1554	561	836,559	43%	46%	11%	0%	0%	0%	0%	358,571	382,390	95,598	-	-	-	-	836,559
1241	561	(84,617)	7%	0%	0%	14%	11%	28%	40%	(5,885)	-	-	(11,731)	(9,231)	(24,010)	(33,760)	(84,617)
1741	561	439	0%	0%	0%	0%	0%	0%	100%	-	-	-	-	-	-	439	439
1549	561	2,222,281	50%	40%	10%	0%	0%	0%	0%	1,121,753	880,422	220,106	-	-	-	-	2,222,281
1482	561	134	44%	1%	0%	20%	6%	23%	5%	59	1	0	27	8	31	7	134
1542	561	1,694,063	95%	4%	1%	0%	0%	0%	0%	1,611,143	66,336	16,584	-	-	-	-	1,694,063
1547	561	436,984	46%	43%	11%	0%	0%	0%	0%	202,829	187,324	46,831	-	-	-	-	436,984
1544	561	3,019,610	60%	32%	8%	0%	0%	0%	0%	1,811,686	966,339	241,585	-	-	-	-	3,019,610
1545	561	7,418,809	67%	26%	7%	0%	0%	0%	0%	5,005,212	1,930,878	482,720	-	-	-	-	7,418,809
1546	561	1,129,593	100%	0%	0%	0%	0%	0%	0%	1,129,593	-	-	-	-	-	-	1,129,593
1543	561	873,173	49%	41%	10%	0%	0%	0%	0%	427,413	356,608	89,152	-	-	-	-	873,173
1461	561	(48)	96%	2%	0%	0%	0%	1%	1%	(46)	(1)	(0)	-	-	(0)	(0)	(48)
1548	561	284,599	93%	5%	1%	0%	0%	0%	0%	265,235	15,491	3,873	-	-	-	-	284,599
1565	568	135,599	77%	18%	5%	0%	0%	0%	0%	104,307	25,034	6,258	-	-	-	-	135,599
1566	568	38,844	100%	0%	0%	0%	0%	0%	0%	38,844	-	-	-	-	-	-	38,844
1751	568	1,904,501	31%	0%	0%	15%	15%	35%	4%	583,918	-	-	291,959	291,959	663,675	72,990	1,904,501
1752	568	2,267,825	27%	4%	1%	27%	22%	18%	0%	619,253	99,080	24,770	619,253	495,402	410,068	-	2,267,825
1756	568	1,218,175	0%	0%	0%	0%	0%	71%	29%	-	-	-	-	-	864,035	354,139	1,218,175
1755	568	648,966	6%	0%	0%	47%	12%	29%	6%	38,346	-	-	306,766	76,692	188,817	38,346	648,966
1564	568	24,048	100%	0%	0%	0%	0%	0%	0%	24,048	-	-	-	-	-	-	24,048
1463	568	31,212	47%	1%	0%	6%	1%	5%	39%	14,819	328	82	2,009	288	1,575	12,112	31,212
1757	568	354,551	7%	0%	0%	30%	30%	26%	7%	26,166	-	-	104,663	104,663	92,893	26,166	354,551
1753	568	985,762	21%	0%	0%	0%	28%	43%	7%	210,159	-	-	-	280,213	425,337	70,053	985,762
1559	568	2,666	60%	32%	8%	0%	0%	0%	0%	1,600	853	213	-	-	-	-	2,666
1558	568	1,406,956	58%	33%	8%	0%	0%	0%	0%	822,440	467,613	116,903	-	-	-	-	1,406,956
1549	568	10,000	50%	40%	10%	0%	0%	0%	0%	5,048	3,962	990	-	-	-	-	10,000
1546	568	(70)	100%	0%	0%	0%	0%	0%	0%	(70)	-	-	-	-	-	-	(70)
1544	568	169,260	60%	32%	8%	0%	0%	0%	0%	101,556	54,163	13,541	-	-	-	-	169,260
1482	568	31,097	44%	1%	0%	20%	6%	23%	5%	13,686	261	65	6,303	1,920	7,281	1,581	31,097
1461	568	2,207,375	96%	2%	0%	0%	0%	1%	1%	2,128,891	43,166	10,792	-	-	12,263	12,263	2,207,375
1241	568	47,631	7%	0%	0%	14%	11%	28%	40%	3,313	-	-	6,603	5,196	13,515	19,004	47,631
1511	568	1,945	67%	27%	7%	0%	0%	0%	0%	1,297	518	130	-	-	-	-	1,945
1711	901	343,408	17%	2%	0%	9%	9%	20%	41%	58,865	6,669	1,667	32,482	32,256	69,878	141,591	343,408
1752	901	(1,470)	27%	4%	1%	27%	22%	18%	0%	(401)	(64)	(16)	(401)	(321)	(266)	-	(1,470)
1462	902	2,337,303	21%	0%	0%	0%	0%	0%	79%	500,851	-	-	-	-	-	1,836,453	2,337,303
1662	902	25,596	8%	0%	0%	0%	0%	50%	42%	2,133	-	-	-	-	12,798	10,665	25,596
1723	902	(490)	80%	16%	4%	0%	0%	0%	0%	(393)	(77)	(19)	-	-	-	-	(490)
1741	902	123	0%	0%	0%	0%	0%	0%	100%	-	-	-	-	-	-	123	123
1731	903	1,337,955	43%	5%	1%	0%	0%	0%	50%	577,551	73,141	18,285	-	-	-	668,978	1,337,955
1725	903	980,486	0%	0%	0%	0%	0%	0%	100%	-	-	-	-	-	-	980,486	980,486
1724	903	943,247	0%	0%	0%	0%	0%	0%	100%	-	-	-	-	-	-	943,247	943,247
1723	903	819,298	80%	16%	4%	0%	0%	0%	0%	657,897	129,121	32,280	-	-	-	-	819,298
1722	903	14,061	0%	0%	0%	0%	0%	0%	100%	-	-	-	-	-	-	14,061	14,061
1721	903	421,493	25%	0%	0%	0%	0%	0%	75%	105,373	-	-	-	-	-	316,120	421,493
1241	903	66,968	7%	0%	0%	14%	11%	28%	40%	4,657	-	-	9,284	7,306	19,002	26,719	66,968
1711	903	73,342	17%	2%	0%	9%	9%	20%	41%	12,572	1,424	356	6,937	6,889	14,924	30,240	73,342
1722	905	81,281	0%	0%	0%	0%	0%	0%	100%	-	-	-	-	-	-	81,281	81,281
1741	908	2,349,952	0%	0%	0%	0%	0%	0%	100%	-	-	-	-	-	-	2,349,952	2,349,952
1721	908	10,286	25%	0%	0%	0%	0%	0%	75%	2,571	-	-	-	-	-	7,714	10,286
1469	920	660,372	24%	15%	4%	6%	9%	24%	18%	161,541	96,529	24,132	42,285	57,749	160,477	117,657	660,372
1442	920	2,693,474	23%	0%	0%	22%	3%	7%	45%	631,797	3,783	946	586,669	72,188	184,822	1,213,268	2,693,474
1451	920	1,011,861	23%	0%	0%	22%	3%	7%	45%	237,348	1,421	355	220,395	27,119	69,432	455,790	1,011,861
1462	920	(280)	21%	0%	0%	0%	0%	0%	79%	(60)	-	-	-	-	-	(220)	(280)
1463	920	308,477	47%	1%	0%	6%	1%	5%	39%	146,456	3,240	810	19,856	2,846	15,564	119,705	308,477
1466	920	718,057	48%	6%	1%	1%	1%	3%	39%	344,535	41,938	10,484	8,576	9,596	24,917	278,010	718,057
1467	920	687,890	9%	0%	0%	0%	0%	0%	91%	62,535	-	-	-	-	-	625,355	687,890
1661	920	987,051	22%	16%	4%	12%	0%	29%	17%	216,155	160,818	40,204	117,450	-	281,325	171,099	987,051
1311	920	466,805	44%	17%	4%	4%	4%	10%	16%	205,592	80,254	20,063	16,917	19,688	48,123	76,167	466,805
1471	920	890,650	23%	0%	0%	22%	3%	7%	45%	208,916	1,251	313	193,994	23,871	61,115	401,191	890,650
1481	920	804,167	45%	2%	1%	27%	3%	17%	6%	363,791	18,395	4,599	214,876	20,104	136,756	45,646	804,167
1611	920	464,608	36%	17%	4%	4%	7%	17%	15%	166,308	80,961	20,240	17,313	33,374	78,859	67,552	464,608
1441	920	158,116	41%	8%	2%	12%	3%	9%	25%	65,152	13,336	3,334	19,253	4,027	13,766	39,248	158,116
1468	920	983,940	44%	17%	4%	4%	4%	10%	17%	433,559	169,019	42,255	34,563	38,674	100,423	165,447	983,940
1433	920	827,049	42%	9%	2%	11%	3%	9%	23%	350,923	78,098	19,524	91,752	21,675	73,647	191,430	827,049
1432	920	389,731	33%	7%	2%	14%	3%	8%	32%	129,320	28,687	7,172	54,359	12,139	32,375	125,681	389,731
1431	920	498,229	37%	12%	3%	10%	4%	9%	26%	185,656	57,573	14,393	47,538	17,527	45,352	130,191	498,229
1424	920	656,344	35%	5%	1%	12%	5%	10%	31%	227,370	33,280	8,320	81,796	32,067	66,868	206,644	656,344
1422	920	644,731	39%	11%	3%	4%	5%	12%	27%	249,010	71,208	17,802	22,685	29,143	79,467	175,417	644,731
1411	920	403,379	37%	6%	1%	11%	3%	9%	31%	151,189	23,962	5,990	46,128	13,695	35,496	126,919	403,379
1361	920	621,933	44%	17%	4%	4%	4%	10%	17%	274,046	106,834	26,709	21,847	24,445	63,476	104,577	621,933
1351	920	399,114	44%	17%	4%	4%	4%	10%	17%	175,864	68,559	17,140	14,020	15,687	40,734	67,110	399,114
1321	920	817,215	44%	17%	4%	4%	5%	10%	16%	359,684	140,659	35,165	30,863	37,691	85,403	127,751	817,215
1241	920	(3,221)	7%	0%	0%	14%	11%	28%	40%	(224)	-	-	(447)	(351)	(914)	(1,285)	(3,221)
1111	920	785,127	44%	17%	4%	4%	5%	10%	16%	345,561	135,136	33,784	29,651	36,211	82,050	122,735	785,127
1641	920	1,574,144	15%	21%	5%	0%	20%	31%	7%	241,160	331,575	82,894	-	313,183	494,028	111,305	1,574,144
1331	920	648,999	44%	17%	4%	4%	5%	10%	16%	285,646	111,705	27,926	24,510	29,932	67,824	101,455	648,999
1861	920	528,803	44%	17%	4%	4%	5%	10%	16%	232,744	91,017	22,754	19,971	24,389	55,262	82,665	528,803
1631	920	3,128,563	44%	17%	4%	4%	5%	10%	16%	1,376,984	538,487	134,622	118,155	144,292	326,950	489,073	3,128,563
1851	920	406,162	44%	17%	4%	4%	5%	10%	16%	178,765	69,908	17,477	15,339	18,733	42,446	63,493	406,162
1841	920	1,122,668	44%	17%	4%	4%	4%	10%	17%	494,687	192,849	48,212	39,436	44,127	114,582	188,774	1,122,668
1831	920	219,789	44%	17%	4%	4%	5%	10%	16%	96,736	37,830	9,458	8,301	10,137	22,969	34,359	219,789
1821	920	451,705	44%	17%	4%	4%	5%	10%	16%	198,810	77,747	19,437	17,059	20,833	47,205	70,613	451,705
1811	920	403,243	44%	17%	4%	4%	4%	10%	16%	177,600	69,325	17,331	14,603	16,980	41,561	65,843	403,243
1662	920	259,890	8%	0%	0%	0%	0%	50%	42%	21,657	-	-	-	-	129,945	108,287	259,890
1841	921	347,578	44%	17%	4%	4%	4%	10%	17%	153,155	59,706	14,927	12,209	13,662	35,475	58,444	347,578
1651	921	2,747	44%	17%	4%	4%	5%	10%	16%	1,209	473	118	104	127	287	429	2,747
1468	921	30,600	44%	17%	4%	4%	4%	10%	17%	13,483	5,256	1,314	1,075	1,203	3,123	5,145	30,600
1471	921	59,146	23%	0%	0%	22%	3%	7%	45%	13,874	83	21	12,883	1,585	4,058	26,642	59,146
1611	921	36,866	36%	17%	4%	4%	7%	17%	15%	13,196	6,424	1,606	1,374	2,648	6,257	5,360	36,866
1631	921	166,295	44%	17%	4%	4%	5%	10%	16%	73,192	28,623	7,156	6,280	7,670	17,379	25,996	166,295
1641	921	91,756	15%	21%	5%	0%	20%	31%	7%	14,057	19,327	4,832	-	18,255	28,796	6,488	91,756
1467	921	39,352	9%	0%	0%	0%	0%	0%	91%	3,577	-	-	-	-	-	35,774	39,352
1661	921	32,027	22%	16%	4%	12%	0%	29%	17%	7,014	5,218	1,305	3,811	-	9,128	5,552	32,027
1662	921	2,384	8%	0%	0%	0%	0%	50%	42%	199	-	-	-	-	1,192	993	2,384
1811	921	18,908	44%	17%	4%	4%	4%	10%	16%	8,327	3,251	813	685	796	1,949	3,087	18,908
1466	921	25,516	48%	6%	1%	1%	1%	3%	39%	12,243	1,490	373	305	341	885	9,879	25,516
1831	921	22,049	44%	17%	4%	4%	5%	10%	16%	9,704	3,795	949	833	1,017	2,304	3,447	22,049
1469	921	28,623	24%	15%	4%	6%	9%	24%	18%	7,002	4,184	1,046	1,833	2,503	6,956	5,100	28,623
1851	921	4,953	44%	17%	4%	4%	5%	10%	16%	2,180	852	213	187	228	518	774	4,953
1861	921	44,203	44%	17%	4%	4%	5%	10%	16%	19,455	7,608	1,902	1,669	2,039	4,619	6,910	44,203
1821	921	159,049	44%	17%	4%	4%	5%	10%	16%	70,003	27,375	6,844	6,007	7,335	16,621	24,863	159,049
1311	921	15,572	44%	17%	4%	4%	4%	10%	16%	6,858	2,677	669	564	657	1,605	2,541	15,572
1481	921	21,969	45%	2%	1%	27%	3%	17%	6%	9,939	503	126	5,870	549	3,736	1,247	21,969
1111	921	56,290	44%	17%	4%	4%	5%	10%	16%	24,775	9,689	2,422	2,126	2,596	5,883	8,799	56,290
1463	921	28,398	47%	1%	0%	6%	1%	5%	39%	13,483	298	75	1,828	262	1,433	11,020	28,398
1321	921	42,254	44%	17%	4%	4%	5%	10%	16%	18,597	7,273	1,818	1,596	1,949	4,416	6,605	42,254
1331	921	19,584	44%	17%	4%	4%	5%	10%	16%	8,619	3,371	843	740	903	2,047	3,061	19,584
1351	921	66,986	44%	17%	4%	4%	4%	10%	17%	29,516	11,507	2,877	2,353	2,633	6,837	11,264	66,986
1361	921	177,771	44%	17%	4%	4%	4%	10%	17%	78,332	30,537	7,634	6,245	6,987	18,144	29,892	177,771
1411	921	27,165	37%	6%	1%	11%	3%	9%	31%	10,182	1,614	403	3,106	922	2,390	8,547	27,165
1442	921	119,185	23%	0%	0%	22%	3%	7%	45%	27,957	167	42	25,960	3,194	8,178	53,687	119,185
1424	921	1,470,081	35%	5%	1%	12%	5%	10%	31%	509,263	74,540	18,635	183,207	71,824	149,770	462,842	1,470,081
1431	921	384,219	37%	12%	3%	10%	4%	9%	26%	143,172	44,398	11,100	36,659	13,516	34,974	100,399	384,219
1432	921	31,307	33%	7%	2%	14%	3%	8%	32%	10,388	2,304	576	4,367	975	2,601	10,096	31,307
1433	921	32,002	42%	9%	2%	11%	3%	9%	23%	13,578	3,022	755	3,550	839	2,850	7,407	32,002
1451	921	157,875	23%	0%	0%	22%	3%	7%	45%	37,032	222	55	34,387	4,231	10,833	71,115	157,875
1441	921	1,429,403	41%	8%	2%	12%	3%	9%	25%	588,989	120,557	30,139	174,047	36,409	124,452	354,809	1,429,403
1422	921	8,748	39%	11%	3%	4%	5%	12%	27%	3,379	966	242	308	395	1,078	2,380	8,748
1641	923	1,170,776	15%	21%	5%	0%	20%	31%	7%	179,364	246,610	61,653	-	232,931	367,435	82,783	1,170,776
1631	923	5,944,502	44%	17%	4%	4%	5%	10%	16%	2,616,373	1,023,166	255,791	224,503	274,165	621,229	929,275	5,944,502

California Independent System Operator
Support for Cost Allocations by ISO Cost Center: Total Costs
For Year Ended December 31, 2002

Center	FERC Code	Actual 2002	Core Reliability Services (CRS) Allocation	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-UD) Allocation Percentage	Forward Scheduling (FS) Allocation Percentage	Congestion Management (CONG) Allocation Percentage	Market Usage (MU) Allocation Percentage	Settlements, Metering and Client Relations (SMCR) Allocation Percentage	Core Reliability Services (CRS) dollars	Energy Transmission Services Net Energy (ETS-NE) dollars	Energy Transmission Services Uninstructed Deviations	Forward Scheduling (FS) dollars	Congestion Management (CONG) dollars	Market Usage (MU) dollars	Settlements, Metering and Client Relations (SMCR) dollars	Total
1611	923	31,789	36%	17%	4%	4%	7%	17%	15%	11,379	5,540	1,385	1,185	2,284	5,396	4,622	31,789
1661	923	185,014	22%	16%	4%	12%	0%	29%	17%	40,516	30,144	7,536	22,015	-	52,732	32,071	185,014
1471	923	367,158	23%	0%	0%	22%	3%	7%	45%	86,123	516	129	79,971	9,840	25,194	165,385	367,158
1831	923	94,560	44%	17%	4%	4%	5%	10%	16%	41,619	16,276	4,069	3,571	4,361	9,882	14,782	94,560
1469	923	238,200	24%	15%	4%	6%	9%	24%	18%	58,269	34,819	8,705	15,252	20,831	57,885	42,440	238,200
1481	923	212,933	45%	2%	1%	27%	3%	17%	6%	96,327	4,871	1,218	56,896	5,323	36,211	12,086	212,933
1662	923	1,932	8%	0%	0%	0%	0%	50%	42%	161	-	-	-	-	966	805	1,932
1861	923	150,096	44%	17%	4%	4%	5%	10%	16%	66,062	25,835	6,459	5,669	6,923	15,686	23,464	150,096
1821	923	24,811	44%	17%	4%	4%	5%	10%	16%	10,920	4,270	1,068	937	1,144	2,593	3,879	24,811
1841	923	1,222,943	44%	17%	4%	4%	4%	10%	17%	538,872	210,074	52,519	42,959	48,068	124,816	205,635	1,222,943
1851	923	309,174	44%	17%	4%	4%	5%	10%	16%	136,078	53,215	13,304	11,676	14,259	32,310	48,332	309,174
1361	923	4,918	44%	17%	4%	4%	4%	10%	17%	2,167	845	211	173	193	502	827	4,918
1468	923	60,458	44%	17%	4%	4%	4%	10%	17%	26,640	10,385	2,596	2,124	2,376	6,171	10,166	60,458
1811	923	110,174	44%	17%	4%	4%	4%	10%	16%	48,524	18,941	4,735	3,990	4,639	11,355	17,990	110,174
1411	923	37,922	37%	6%	1%	11%	3%	9%	31%	14,213	2,253	563	4,337	1,287	3,337	11,932	37,922
1467	923	56,615	9%	0%	0%	0%	0%	0%	91%	5,147	-	-	-	-	-	51,468	56,615
1311	923	2,180	44%	17%	4%	4%	4%	10%	16%	960	375	94	79	92	225	356	2,180
1321	923	1,395,806	44%	17%	4%	4%	5%	10%	16%	614,340	240,246	60,061	52,715	64,376	145,868	218,200	1,395,806
1331	923	43,909	44%	17%	4%	4%	5%	10%	16%	19,326	7,558	1,889	1,658	2,025	4,589	6,864	43,909
1424	923	167,395	35%	5%	1%	12%	5%	10%	31%	57,989	8,488	2,122	20,861	8,178	17,054	52,703	167,395
1351	923	260,192	44%	17%	4%	4%	4%	10%	17%	114,650	44,695	11,174	9,140	10,227	26,556	43,751	260,192
1431	923	47,192	37%	12%	3%	10%	4%	9%	26%	17,585	5,453	1,363	4,503	1,660	4,296	12,332	47,192
1432	923	5,928	33%	7%	2%	14%	3%	8%	32%	1,967	436	109	827	185	492	1,912	5,928
1433	923	6,064	42%	9%	2%	11%	3%	9%	23%	2,573	573	143	673	159	540	1,404	6,064
1441	923	78,853	41%	8%	2%	12%	3%	9%	25%	32,492	6,651	1,663	9,601	2,009	6,865	19,573	78,853
1442	923	69,923	23%	0%	0%	22%	3%	7%	45%	16,402	98	25	15,230	1,874	4,798	31,497	69,923
1451	923	146,499	23%	0%	0%	22%	3%	7%	45%	34,364	206	51	31,909	3,926	10,053	65,990	146,499
1463	923	19,864	47%	1%	0%	6%	1%	5%	39%	9,431	209	52	1,279	183	1,002	7,708	19,864
1466	923	534,862	48%	6%	1%	1%	1%	3%	39%	256,635	31,238	7,810	6,388	7,148	18,560	207,083	534,862
1331	924	1,326,996	44%	17%	4%	4%	5%	10%	16%	584,055	228,402	57,101	50,116	61,202	138,677	207,443	1,326,996
1631	928	2,548,195	44%	17%	4%	4%	5%	10%	16%	1,121,545	438,594	109,649	96,236	117,525	266,299	398,347	2,548,195
1831	930	3,948	44%	17%	4%	4%	5%	10%	16%	1,737	679	170	149	182	413	617	3,948
1841	930	25,890	44%	17%	4%	4%	4%	10%	17%	11,408	4,447	1,112	909	1,018	2,642	4,353	25,890
1331	930	103,038	44%	17%	4%	4%	5%	10%	16%	45,351	17,735	4,434	3,891	4,752	10,768	16,108	103,038
1651	930	87,645	44%	17%	4%	4%	5%	10%	16%	38,575	15,085	3,771	3,310	4,042	9,159	13,701	87,645
1351	931	2,435,656	44%	17%	4%	4%	4%	10%	17%	1,073,236	418,391	104,598	85,558	95,734	248,589	409,550	2,435,656
1361	931	87,033	44%	17%	4%	4%	4%	10%	17%	38,350	14,950	3,738	3,057	3,421	8,883	14,634	87,033
1424	931	8,517,963	35%	5%	1%	12%	5%	10%	31%	2,950,779	431,900	107,975	1,061,538	416,164	867,801	2,681,808	8,517,963
1431	931	5,968,442	37%	12%	3%	10%	4%	9%	26%	2,224,035	689,681	172,420	569,467	209,964	543,282	1,559,594	5,968,442
1441	931	27,401,993	41%	8%	2%	12%	3%	9%	25%	11,291,056	2,311,106	577,776	3,336,526	697,974	2,385,776	6,801,778	27,401,993
1351	935	2,033,676	44%	17%	4%	4%	4%	10%	17%	896,109	349,340	87,335	71,438	79,934	207,561	341,958	2,033,676
1641	935	58,016	15%	21%	5%	0%	20%	31%	7%	8,888	12,220	3,055	-	11,543	18,208	4,102	58,016
1462	935	32,454	21%	0%	0%	0%	0%	0%	79%	6,955	-	-	-	-	-	25,500	32,454
1451	935	207,880	23%	0%	0%	22%	3%	7%	45%	48,761	292	73	45,279	5,571	14,264	93,639	207,880
1442	935	11,000	23%	0%	0%	22%	3%	7%	45%	2,580	15	4	2,396	295	755	4,955	11,000
1441	935	329,672	41%	8%	2%	12%	3%	9%	25%	135,842	27,805	6,951	40,142	8,397	28,703	81,832	329,672
1431	935	87,625	37%	12%	3%	10%	4%	9%	26%	32,652	10,125	2,531	8,361	3,083	7,976	22,897	87,625
1361	935	1,345,544	44%	17%	4%	4%	4%	10%	17%	592,894	231,134	57,784	47,265	52,887	137,329	226,250	1,345,544
1661	935	7,500	22%	16%	4%	12%	0%	29%	17%	1,642	1,222	305	892	-	2,138	1,300	7,500
1424	935	6,220,162	35%	5%	1%	12%	5%	10%	31%	2,154,778	315,391	78,848	775,178	303,899	633,703	1,958,364	6,220,162
Total Operating Exp before deprec		152,328,280	43%	13%	3%	7%	4%	9%	22%	64,898,977	19,384,433	4,846,108	########	5,508,495	13,623,100	33,109,313	152,328,280

Note:
Derivation of the allocation factors for the ISO's costs are those used for 2004.
This worksheet documents the mapping, or translation of the cost percentages to the FERC accounts used in this Section 35.13 filing.

Total Operating Expenses before adjustments = $155,745,311
The O&M figures above are adjusted to agree with the Form 1 figures reported for 2002. For purposes of the prospective rate filing, certain items would be included in the O&M budget, but omitted from the Form 1 reported O&M figures. Adjusting factors for 2002 included:

- Capital projects-Internal Capitalized labor costs
- Correct Pension Plan Cost Overstatement
- Reclass Impairment of Asset Entry
- Addl MCI Monthly Accrual
- 5% 401 K True-up

2004 Cost Allocation Factors

	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-UD)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations (SMCR)	Total
Overall Allocation Factors: Prior to reallocation c	39%	10%	3%	9%	5%	11%	24%	100.0000%
Post Reallocation	39%	23%	6%	9%	7%	16%	0%	100.0000%
Difference	0%	-13%	-3%	0%	-2%	-5%	24%	
Percent of Settlements, Metering & Client Relations		56%	14%	0%	8%	21%		

California Independent System Operator
Support for Cost Allocations by ISO Cost Center
For Year Ended December 31, 2002

Cost Center	Cost Center Name	Core Reliability Services (CRS)	Energy Transmission Services Net Energy (ETS-NE)	Energy Transmission Services Uninstructed Deviations (ETS-UD)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering and Client Relations (SMCR)
1111	CEO - General	44.0%	17.2%	4.3%	3.8%	4.6%	10.5%	15.6%
1241	MD02	7.0%	0.0%	0.0%	13.9%	10.9%	28.4%	39.9%
1311	CFO - General	44.0%	17.2%	4.3%	3.6%	4.2%	10.3%	16.3%
1321	Accounting	44.0%	17.2%	4.3%	3.8%	4.6%	10.5%	15.6%
1331	Financial Planning and Treasury	44.0%	17.2%	4.3%	3.8%	4.6%	10.5%	15.6%
1351	Facilities	44.1%	17.2%	4.3%	3.5%	3.9%	10.2%	16.8%
1361	Office Administration	44.1%	17.2%	4.3%	3.5%	3.9%	10.2%	16.8%
1411	Chief Information Officer- General	37.5%	5.9%	1.5%	11.4%	3.4%	8.8%	31.5%
1422	Corporate & Enterprise Applications - General	38.6%	11.0%	2.8%	3.5%	4.5%	12.3%	27.2%
1424	Asset Management	34.6%	5.1%	1.3%	12.5%	4.9%	10.2%	31.5%
1431	End User Support	37.3%	11.6%	2.9%	9.5%	3.5%	9.1%	26.1%
1432	Computer Operations - General	33.2%	7.4%	1.8%	13.9%	3.1%	8.3%	32.2%
1433	Network Operations	42.4%	9.4%	2.4%	11.1%	2.6%	8.9%	23.1%
1441	Outsourced Contracts	41.2%	8.4%	2.1%	12.2%	2.5%	8.7%	24.8%
1442	Production Support	23.5%	0.1%	0.0%	21.8%	2.7%	6.9%	45.0%
1451	Information Security	23.5%	0.1%	0.0%	21.8%	2.7%	6.9%	45.0%
1461	Control Systems	96.4%	2.0%	0.5%	0.0%	0.0%	0.6%	0.6%
1462	Field Data Acquisition System (FDAS)	21.4%	0.0%	0.0%	0.0%	0.0%	0.0%	78.6%
1463	Operations Applications - General	47.5%	1.1%	0.3%	6.4%	0.9%	5.0%	38.8%
1466	Enterprise Applications	48.0%	5.8%	1.5%	1.2%	1.3%	3.5%	38.7%
1467	Settlement Systems Services	9.1%	0.0%	0.0%	0.0%	0.0%	0.0%	90.9%
1468	Corporate Application Support	44.1%	17.2%	4.3%	3.5%	3.9%	10.2%	16.8%
1469	Analytical and Reporting	24.5%	14.6%	3.7%	6.4%	8.7%	24.3%	17.8%
1471	IT Planning	23.5%	0.1%	0.0%	21.8%	2.7%	6.9%	45.0%
1481	Markets and Scheduling	45.2%	2.3%	0.6%	26.7%	2.5%	17.0%	5.7%
1482	Market Support Services	44.0%	0.8%	0.2%	20.3%	6.2%	23.4%	5.1%
1511	VP Grid Operations - General	66.7%	26.6%	6.7%	0.0%	0.0%	0.0%	0.0%
1521	Grid Planning	62.5%	30.0%	7.5%	0.0%	0.0%	0.0%	0.0%
1542	Outage Coordination	95.1%	3.9%	1.0%	0.0%	0.0%	0.0%	0.0%
1543	Loads and Resources	48.9%	40.8%	10.2%	0.0%	0.0%	0.0%	0.0%
1544	Real-Time Scheduling	60.0%	32.0%	8.0%	0.0%	0.0%	0.0%	0.0%
1545	Grid Operations - General	67.5%	26.0%	6.5%	0.0%	0.0%	0.0%	0.0%
1546	Security Coordination	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1547	Engineering and Maintenance - General	46.4%	42.9%	10.7%	0.0%	0.0%	0.0%	0.0%
1548	OSAT Group - General	93.2%	5.4%	1.4%	0.0%	0.0%	0.0%	0.0%
1549	Operations Training	50.5%	39.6%	9.9%	0.0%	0.0%	0.0%	0.0%
1554	Special Projects Engineering	42.9%	45.7%	11.4%	0.0%	0.0%	0.0%	0.0%
1555	Operations Support Group	55.6%	35.6%	8.9%	0.0%	0.0%	0.0%	0.0%
1558	Transmission Maintenance	58.5%	33.2%	8.3%	0.0%	0.0%	0.0%	0.0%
1559	Operations Application Support	60.0%	32.0%	8.0%	0.0%	0.0%	0.0%	0.0%
1561	Operations Engineering South	65.3%	27.7%	6.9%	0.0%	0.0%	0.0%	0.0%
1562	Operations Engineering North	55.1%	35.9%	9.0%	0.0%	0.0%	0.0%	0.0%
1563	Coordinated Operations	74.6%	20.4%	5.1%	0.0%	0.0%	0.0%	0.0%
1564	Operations Scheduling - General	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1565	Pre-Scheduling and Support	76.9%	18.5%	4.6%	0.0%	0.0%	0.0%	0.0%
1566	Regional Coordination - General	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1611	VP General Counsel - General	35.8%	17.4%	4.4%	3.7%	7.2%	17.0%	14.5%
1631	Legal and Regulatory	44.0%	17.2%	4.3%	3.8%	4.6%	10.5%	15.6%
1641	Market Analysis	15.3%	21.1%	5.3%	0.0%	19.9%	31.4%	7.1%
1642	MSC	25.0%	20.0%	5.0%	0.0%	25.0%	25.0%	0.0%
1651	Board of Governors	44.0%	17.2%	4.3%	3.8%	4.6%	10.5%	15.6%
1661	Compliance - General	21.9%	16.3%	4.1%	11.9%	0.0%	28.5%	17.3%
1662	Compliance - Audits	8.3%	0.0%	0.0%	0.0%	0.0%	50.0%	41.7%
1711	VP Market Services - General	17.1%	1.9%	0.5%	9.5%	9.4%	20.3%	41.2%
1721	Billing and Settlements-General	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%	75.0%
1722	Application Support	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
1723	Tariff and Contract Implementation	80.3%	15.8%	3.9%	0.0%	0.0%	0.0%	0.0%
1724	BBS - PSS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
1725	BBS - FSS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
1731	Contracts and Special Projects	43.2%	5.5%	1.4%	0.0%	0.0%	0.0%	50.0%
1741	Client Relations	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
1751	Market Operations - General	30.7%	0.0%	0.0%	15.3%	15.3%	34.8%	3.8%
1752	Manager of Markets	27.3%	4.4%	1.1%	27.3%	21.8%	18.1%	0.0%
1753	Market Engineering	21.3%	0.0%	0.0%	0.0%	28.4%	43.1%	7.1%
1755	Business Solutions	5.9%	0.0%	0.0%	47.3%	11.8%	29.1%	5.9%
1756	Market Quality - General	0.0%	0.0%	0.0%	0.0%	0.0%	70.9%	29.1%
1757	Market Integration	7.4%	0.0%	0.0%	29.5%	29.5%	26.2%	7.4%
1811	VP Corporate and Strategic Development - General	44.0%	17.2%	4.3%	3.6%	4.2%	10.3%	16.3%
1821	Communications	44.0%	17.2%	4.3%	3.8%	4.6%	10.5%	15.6%
1831	Strategic Development	44.0%	17.2%	4.3%	3.8%	4.6%	10.5%	15.6%
1841	Human Resources	44.1%	17.2%	4.3%	3.5%	3.9%	10.2%	16.8%
1851	Project Office	44.0%	17.2%	4.3%	3.8%	4.6%	10.5%	15.6%
1861	Regulatory Policy	44.0%	17.2%	4.3%	3.8%	4.6%	10.5%	15.6%

Note:
These allocation factors are the same as those used in the Period II filing.

California Independent System Operator
Support for Cost Allocations by ISO Cost Center: Salary Costs
For Year Ended December 31, 2002

Center	FERC_Short	Salaries	Core Reliability Services (CRS) Allocation Percentage	Energy Transmission Services Net Energy (ETS-NE) Allocation Percentage	Energy Transmission Services Uninstructed Deviations (ETS-UD) Allocation Percentage	Forward Scheduling (FS) Allocation Percentage	Congestion Management (CONG) Allocation Percentage	Market Usage (MU) Allocation Percentage	Settlements, Metering and Client Relations (SMCR) Allocation Percentage	Core Reliability Services (CRS) dollars	Energy Transmission Services Net Energy (ETS NE) dollars	Energy Transmission Services Uninstructed Deviations (ETS-UD) dollars	Forward Scheduling (FS) dollars	Congestion Management (CONG) dollars	Market Usage (MU) dollars	Settlements, Metering and Client Relations (SMCR) dollars	Total
1521	560	1,939,886	63%	30%	8%	0%	0%	0%	0%	1,212,429	581,966	145,491	-	-	-	-	1,939,886
1511	560	520,990	67%	27%	7%	0%	0%	0%	0%	347,531	138,767	34,692	-	-	-	-	520,990
1559	561	250,347	60%	32%	8%	0%	0%	0%	0%	150,208	80,111	20,028	-	-	-	-	250,347
1752	561	23,172	27%	4%	1%	27%	22%	18%	0%	6,327	1,012	253	6,327	5,062	4,190	-	23,172
1566	561	368,561	100%	0%	0%	0%	0%	0%	0%	368,561	-	-	-	-	-	-	368,561
1565	561	1,505,590	77%	18%	5%	0%	0%	0%	0%	1,158,146	277,955	69,489	-	-	-	-	1,505,590
1564	561	201,439	100%	0%	0%	0%	0%	0%	0%	201,439	-	-	-	-	-	-	201,439
1563	561	308,504	75%	20%	5%	0%	0%	0%	0%	229,999	62,804	15,701	-	-	-	-	308,504
1561	561	1,064,530	65%	28%	7%	0%	0%	0%	0%	695,399	295,304	73,826	-	-	-	-	1,064,530
1558	561	48,702	58%	33%	8%	0%	0%	0%	0%	28,469	16,186	4,047	-	-	-	-	48,702
1555	561	958,752	56%	36%	9%	0%	0%	0%	0%	532,640	340,889	85,222	-	-	-	-	958,752
1554	561	602,708	43%	46%	11%	0%	0%	0%	0%	258,337	275,497	68,874	-	-	-	-	602,708
1542	561	1,493,722	95%	4%	1%	0%	0%	0%	0%	1,420,608	58,491	14,623	-	-	-	-	1,493,722
1562	561	941,961	55%	36%	9%	0%	0%	0%	0%	519,450	338,009	84,502	-	-	-	-	941,961
1241	561	(109,845)	7%	0%	0%	14%	11%	28%	40%	(7,639)	-	-	(15,229)	(11,983)	(31,169)	(43,826)	(109,845)
1549	561	1,697,254	50%	40%	10%	0%	0%	0%	0%	856,732	672,417	168,104	-	-	-	-	1,697,254
1543	561	811,215	49%	41%	10%	0%	0%	0%	0%	397,085	331,304	82,826	-	-	-	-	811,215
1544	561	2,716,417	60%	32%	8%	0%	0%	0%	0%	1,629,850	869,253	217,313	-	-	-	-	2,716,417
1545	561	6,884,119	67%	26%	7%	0%	0%	0%	0%	4,644,475	1,791,715	447,929	-	-	-	-	6,884,119
1546	561	1,049,926	100%	0%	0%	0%	0%	0%	0%	1,049,926	-	-	-	-	-	-	1,049,926
1547	561	289,834	46%	43%	11%	0%	0%	0%	0%	134,529	124,244	31,061	-	-	-	-	289,834
1548	561	199,578	93%	5%	1%	0%	0%	0%	0%	185,999	10,863	2,716	-	-	-	-	199,578
1461	561	(48)	96%	2%	0%	0%	0%	1%	1%	(46)	(1)	(0)	-	-	(0)	(0)	(48)
1565	568	135,599	77%	18%	5%	0%	0%	0%	0%	104,307	25,034	6,258	-	-	-	-	135,599
1241	568	46,213	7%	0%	0%	14%	11%	28%	40%	3,214	-	-	6,407	5,041	13,113	18,438	46,213
1757	568	277,489	7%	0%	0%	30%	30%	26%	7%	20,479	-	-	81,915	81,915	72,702	20,479	277,489
1756	568	1,113,493	0%	0%	0%	0%	0%	71%	29%	-	-	-	-	-	789,786	323,707	1,113,493
1755	568	577,250	6%	0%	0%	47%	12%	29%	6%	34,108	-	-	272,866	68,216	167,951	34,108	577,250
1753	568	861,168	21%	0%	0%	0%	28%	43%	7%	183,597	-	-	-	244,795	371,577	61,199	861,168
1752	568	2,143,852	27%	4%	1%	27%	22%	18%	0%	585,400	93,664	23,416	585,400	468,320	387,651	-	2,143,852
1751	568	269,744	31%	0%	0%	15%	15%	35%	4%	82,703	-	-	41,352	41,352	94,000	10,338	269,744
1566	568	38,844	100%	0%	0%	0%	0%	0%	0%	38,844	-	-	-	-	-	-	38,844
1558	568	916,932	58%	33%	8%	0%	0%	0%	0%	535,995	304,750	76,187	-	-	-	-	916,932
1549	568	10,000	50%	40%	10%	0%	0%	0%	0%	5,048	3,962	990	-	-	-	-	10,000
1546	568	(70)	100%	0%	0%	0%	0%	0%	0%	(70)	-	-	-	-	-	-	(70)
1544	568	169,260	60%	32%	8%	0%	0%	0%	0%	101,556	54,163	13,541	-	-	-	-	169,260
1482	568	29,981	44%	1%	0%	20%	6%	23%	5%	13,195	251	63	6,076	1,851	7,020	1,524	29,981
1461	568	2,027,026	96%	2%	0%	0%	0%	1%	1%	1,954,954	39,640	9,910	-	-	11,261	11,261	2,027,026
1564	568	24,048	100%	0%	0%	0%	0%	0%	0%	24,048	-	-	-	-	-	-	24,048
1463	568	31,212	47%	1%	0%	6%	1%	5%	39%	14,819	328	82	2,009	288	1,575	12,112	31,212
1711	901	318,330	17%	2%	0%	9%	9%	20%	41%	54,566	6,182	1,546	30,110	29,901	64,775	131,251	318,330
1752	901	(1,470)	27%	4%	1%	27%	22%	18%	0%	(401)	(64)	(16)	(401)	(321)	(266)	-	(1,470)
1462	902	1,755,907	21%	0%	0%	0%	0%	0%	79%	376,266	-	-	-	-	-	1,379,641	1,755,907
1662	902	25,596	8%	0%	0%	0%	0%	50%	42%	2,133	-	-	-	-	12,798	10,665	25,596
1723	902	(490)	80%	16%	4%	0%	0%	0%	0%	(393)	(77)	(19)	-	-	-	-	(490)
1241	903	63,510	7%	0%	0%	14%	11%	28%	40%	4,417	-	-	8,805	6,928	18,021	25,339	63,510
1711	903	73,342	17%	2%	0%	9%	9%	20%	41%	12,572	1,424	356	6,937	6,889	14,924	30,240	73,342
1721	903	380,465	25%	0%	0%	0%	0%	0%	75%	95,116	-	-	-	-	-	285,349	380,465
1722	903	14,061	0%	0%	0%	0%	0%	0%	100%	-	-	-	-	-	-	14,061	14,061
1723	903	779,730	80%	16%	4%	0%	0%	0%	0%	626,124	122,885	30,721	-	-	-	-	779,730
1724	903	879,006	0%	0%	0%	0%	0%	0%	100%	-	-	-	-	-	-	879,006	879,006
1725	903	930,563	0%	0%	0%	0%	0%	0%	100%	-	-	-	-	-	-	930,563	930,563
1731	903	1,132,897	43%	5%	1%	0%	0%	0%	50%	489,034	61,931	15,483	-	-	-	566,449	1,132,897
1722	905	62,265	0%	0%	0%	0%	0%	0%	100%	-	-	-	-	-	-	62,265	62,265
1721	908	10,286	25%	0%	0%	0%	0%	0%	75%	2,571	-	-	-	-	-	7,714	10,286
1741	908	2,063,212	0%	0%	0%	0%	0%	0%	100%	-	-	-	-	-	-	2,063,212	2,063,212
1631	920	3,128,563	44%	17%	4%	4%	5%	10%	16%	1,376,984	538,487	134,622	118,155	144,292	326,950	489,073	3,128,563
1467	920	687,534	9%	0%	0%	0%	0%	0%	91%	62,503	-	-	-	-	-	625,031	687,534
1641	920	1,122,668	44%	17%	4%	4%	4%	10%	17%	494,687	192,849	48,212	39,436	44,127	114,582	188,774	1,122,668
1468	920	983,940	44%	17%	4%	4%	4%	10%	17%	433,559	169,019	42,255	34,563	38,674	100,423	165,447	983,940
1469	920	660,372	24%	15%	4%	6%	9%	24%	18%	161,541	96,529	24,132	42,285	57,749	160,477	117,657	660,372
1471	920	890,650	23%	0%	0%	22%	3%	7%	45%	208,916	1,251	313	193,994	23,871	61,115	401,191	890,650
1481	920	804,167	45%	2%	1%	27%	3%	17%	6%	363,791	18,395	4,599	214,876	20,104	136,756	45,646	804,167
1611	920	464,608	36%	17%	4%	4%	7%	17%	15%	166,308	80,961	20,240	17,313	33,374	78,859	67,552	464,608
1641	920	1,574,144	15%	21%	5%	0%	20%	31%	7%	241,160	331,575	82,894	-	313,183	494,028	111,305	1,574,144
1661	920	987,051	22%	16%	4%	12%	0%	29%	17%	216,155	160,818	40,204	117,450	-	281,325	171,099	987,051
1662	920	259,890	8%	0%	0%	0%	0%	50%	42%	21,657	-	-	-	-	129,945	108,287	259,890
1811	920	403,243	44%	17%	4%	4%	4%	10%	16%	177,600	69,325	17,331	14,603	16,980	41,561	65,843	403,243
1466	920	718,057	48%	6%	1%	1%	1%	3%	39%	344,535	41,938	10,484	8,576	9,596	24,917	278,010	718,057
1831	920	219,789	44%	17%	4%	4%	5%	10%	16%	96,736	37,830	9,458	8,301	10,137	22,969	34,359	219,789
1433	920	827,049	42%	9%	2%	11%	3%	9%	23%	350,923	78,098	19,524	91,752	21,675	73,647	191,430	827,049
1851	920	406,162	44%	17%	4%	4%	5%	10%	16%	178,765	69,908	17,477	15,339	18,733	42,446	63,493	406,162
1861	920	528,803	44%	17%	4%	4%	5%	10%	16%	232,744	91,017	22,754	19,971	24,389	55,262	82,665	528,803
1821	920	451,705	44%	17%	4%	4%	5%	10%	16%	198,810	77,747	19,437	17,059	20,833	47,205	70,613	451,705
1411	920	403,379	37%	6%	1%	11%	3%	9%	31%	151,189	23,962	5,990	46,128	13,695	35,496	126,919	403,379
1111	920	785,127	44%	17%	4%	4%	5%	10%	16%	345,561	135,136	33,784	29,651	36,211	82,050	122,735	785,127
1241	920	(3,221)	7%	0%	0%	14%	11%	28%	40%	(224)	-	-	(447)	(351)	(914)	(1,285)	(3,221)
1311	920	466,805	44%	17%	4%	4%	4%	10%	16%	205,592	80,254	20,063	16,917	19,688	48,123	76,167	466,805
1321	920	817,215	44%	17%	4%	4%	5%	10%	16%	359,684	140,659	35,165	30,863	37,691	85,403	127,751	817,215
1331	920	648,999	44%	17%	4%	4%	5%	10%	16%	285,646	111,705	27,926	24,510	29,932	67,824	101,455	648,999
1442	920	2,692,107	23%	0%	0%	22%	3%	7%	45%	631,477	3,781	945	586,371	72,152	184,728	1,212,653	2,692,107
1361	920	621,933	44%	17%	4%	4%	4%	10%	17%	274,046	106,834	26,709	21,847	24,445	63,476	104,577	621,933
1463	920	308,477	47%	1%	0%	6%	1%	5%	39%	146,456	3,240	810	19,856	2,846	15,564	119,705	308,477
1422	920	644,731	39%	11%	3%	4%	5%	12%	27%	249,010	71,208	17,802	22,685	29,143	79,467	175,417	644,731
1424	920	656,344	35%	5%	1%	12%	5%	10%	31%	227,370	33,280	8,320	81,796	32,067	66,868	206,644	656,344
1431	920	498,229	37%	12%	3%	10%	4%	9%	26%	185,656	57,573	14,393	47,538	17,527	45,352	130,191	498,229
1432	920	389,731	33%	7%	2%	14%	3%	8%	32%	129,320	28,687	7,172	54,359	12,139	32,375	125,681	389,731
1441	920	158,116	41%	8%	2%	12%	3%	9%	25%	65,152	13,336	3,334	19,253	4,027	13,766	39,248	158,116
1451	920	1,011,861	23%	0%	0%	22%	3%	7%	45%	237,348	1,421	355	220,395	27,119	69,432	455,790	1,011,861
1462	920	(280)	21%	0%	0%	0%	0%	0%	79%	(60)	-	-	-	-	-	(220)	(280)
1351	920	399,114	44%	17%	4%	4%	4%	10%	17%	175,864	68,559	17,140	14,020	15,687	40,734	67,110	399,114
1661	921	(490)	22%	16%	4%	12%	0%	29%	17%	(107)	(80)	(20)	(58)	-	(140)	(85)	(490)
1424	921	(350)	35%	5%	1%	12%	5%	10%	31%	(121)	(18)	(4)	(44)	(17)	(36)	(110)	(350)
1433	921	(4,900)	42%	9%	2%	11%	3%	9%	23%	(2,079)	(463)	(116)	(544)	(128)	(436)	(1,134)	(4,900)
		66,537,885	45.7%	14.9%	3.7%	4.8%	3.2%	7.7%	20.0%	30,378,806	9,915,684	2,478,921	3,221,343	2,119,844	5,121,507	13,301,780	66,537,885

Note:
Allocation factors are those applicable to 2004 costs.
Allocation factors applied are those for the cost centers as a whole.

California ISO
Calculation of Financial & Capital Operating Reserve Account Balance as of 12/2002

		Per 11/2/2002 Filing				Actual							Allocation Percentages			
		CAS	CONG	Market Ops/ ASREO	Total	CAS	CONG	Market Ops/ ASREO	Total	Difference	General Notes	Allocation Notes	CAS	CONG	Market Ops/ ASREO	Total
1	BEGINNING RESERVE BALANCE, 1/1/2002	22,953	4,850	34,907	62,710	22,953	4,850	34,907	62,710		Per 2001 Section 35 Filing.		36.6%	7.7%	55.7%	100.0%
2	CALCULATION OF CONTRIBUTION TO RESERVE FROM OPERATIONS															
3	Revenue:															
4	GMC Rates: 2002 Revenue	132,866	29,105	62,364	224,334	133,297	28,438	62,735	224,470	136	2002 Collections, updated figures replacing those from 11/2/2002 filing. Actual collections per accounting records. Includes post audited adjustments (differs from Form 1 amount of $219.014)	Actual collections.	59.4%	12.7%	27.9%	100.0%
5	Other (Interest Income, WECC reimbursement)	2,473	311	1,024	3,808	2,523	335	1,061	3,920	112	Updated figures replacing those from 11/2/2002 filing. SC Application fees: $11.5, WECC reimbursement: $1,127, interest and	Security coordinator fees assigned to CAS, remainder (mainly interest) spread proportionately.	64.4%	8.5%	27.1%	100.0%
6	Expenses:															
7	O&M	(95,742)	(18,014)	(53,209)	(166,965)	(89,706)	(16,878)	(49,854)	(156,438)	10,527	Updated based on actual 2002 results. (Per supporting schedules for audited F/S) less, depreciation/amortization= $152,328 and excluding $4,110 of capitalized internal labor costs. Net is: $156.438	Per 2002 cost allocation matrix, O&M costs.	57.3%	10.8%	31.9%	100.0%
8	Debt Service	(20,092)	(4,481)	(19,938)	(44,510)	(19,782)	(4,412)	(19,631)	(43,825)	685	Updated based on actual 2002 results. (Per supporting schedules for audited F/S). Interest is $10,458. Principal amount is $33,367 (payments to Trustee in 2002). Interest is at higher rate from 2000 swap, offset by interest income from GIC, included in other income above	Variance spread proportionately. Allocation based on filed 2001 debt service allocation factors.	45.1%	10.1%	44.8%	100.0%
8a	Cash Funded CapEx	(5,559)	(645)	(2,096)	(8,301)	(5,559)	(645)	(2,096)	(8,301)	-	As planned, any variance would be below in Line 11.		67.0%	7.8%	25.3%	100.0%
9	Contribution to Operating Reserve	13,946	6,275	(11,855)	8,367	20,773	6,837	(7,785)	19,826	11,459						
10	OTHER RESERVE USES															
11	Use of Reserve for CapEx	(3,589)	(2,617)	(7,494)	(13,699)	(3,698)	(2,696)	(7,721)	(14,116)	(417)	Actual of $22,417 (located on this line and line 8a)	Per 2002 cost allocation matrix.	26.2%	19.1%	54.7%	100.0%
12	Amendment 33 Fines	(11,136)	(2,088)	(9,976)	(23,200)	(11,136)	(2,088)	(9,976)	(23,200)	-	Actual fines provided toward 2002 rates per 11/2/2001 filing. As of 10/2003, total fines collections are $60.7 million, $19.96 million is likely to be retained by ISO (toward GMC rates), while remainder is to be reduced/returned to parties assessed. $43.161 was recognized in the Operating Reserve in the previous year, and reduced by $23,200 to a	Allocated based on proportion of forecasted GMC collections in 2001.	48.0%	9.0%	43.0%	100.0%
12a	Reallocation of Fines per 2002 GMC Settlement	(4,065)	(1,151)	5,216	(0)	(4,065)	(1,151)	5,216	(0)	-	Reallocation per terms of 2002 GMC Settlement	Up to $9 million reallocated per 2002 GMC settlement.				
13	Interest on Refunds from 2002 GMC Settlement	*(46)*	*(29)*	*(85)*	*(160)*	*(142)*	*(27)*	*(127)*	*(295)*	(135)	Refund on excess 2002 GMC collections per Settlement Agmt paid in February 2003, later than anticipated.	Same as above.	48.0%	9.0%	43.0%	100.0%
14	*2001 GMC Case Refunds per 5/2/2003 FERC Order (related to 2001 incentive compensation)*					*(923)*	*(133)*	*(743)*	*(1,800)*	(1,800)	*Order 463 indicated $1.8 million in "overbudgeted" incentive compensation should be returned as a refund to 2001 ratepayers. ISO has filed a request for rehearing on this.*	*Allocated with 2001 GMC O&M budget factors.*	51.3%	7.4%	41.3%	100.0%
15	*Matters Pending Dispute Resolution, Litigation or Appeal including interest on potential awards or judgment.*					*(13,567)*	*(1,335)*	*(2,724)*	*(17,626)*	(17,626)	*The outcome of several matters is pending, and until such time as a final determination is made, amounts potentially payable are set aside in this reserve calculation.*	*Allocation is detailed for each item.*	77.0%	7.6%	15.5%	100.0%
16	*Interest on Excess collection of Amendment 33 fines.*					*(585)*	*(69)*	*(1,465)*	*(2,118)*		*Interest through 12/31/2002 on Amend 33 fines likely to be returned. $60.7 million collections less $19.9 million to keep, difference of $40.8 million. Interest calculated at FERC interest rate.*	*Allocated in same proportion as total Amend 33 Fines collected*	27.6%	3.2%	69.1%	100.0%
17	*Interest on 2001 GMC Case Refunds per 5/2/2003 FERC Order (related to incentive compensation)*					*(63)*	*(9)*	*(51)*	*(122)*	(122)	*Estimate of interest related to the $1.8 million refund from 2001 to end of year 2002.*	*Allocated with 2001 GMC O&M budget factors.*	51.3%	7.4%	41.3%	100.0%
18	Net Increase in Operating Reserve (Sum Lines 9-17)	(4,891)	391	(24,193)	(28,693)	(13,406)	(670)	(25,375)	(39,452)	(10,759)						
19	Ending Reserve Balance	18,062	5,241	10,714	34,018	9,547	4,180	9,532	23,259	(10,759)						
20	Less: Reserve Requirement (15% of 2003 Budget, Line	16,066	2,694	7,001	25,761	16,066	2,694	7,001	25,761							
21	FY2003 Operating Budget	*107,105*	*17,958*	*46,675*	*171,739*	*107,105*	*17,958*	*46,675*	*171,739*							
22	Equals: Revenue Credit Available	1,996	2,547	3,713	8,257	(6,519)	1,487	2,530	(2,502)	(10,759)						

California Independent System Operator
Statement BL
Rate Design Information
For the Period Ending December 31, 2002

Rate Design Information is discussed elsewhere in this filing.
Rate Categories displayed in Period I documentation are those proposed for 2004.

Descriptions of the rate categories are provided in the testimony of Dr. Barbara Barkovich and Cathy Yap.

California Independent System Operator
Statement BM
Construction Program Statement
December 31, 2002

Not applicable to the California ISO, which has no such construction program.

California Independent System Operator
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Period II (2004) Data

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California Independent System Operator
Statement AA
Balance Sheet
December 31, 2004
Unaudited
In Thousands

Line No.	Account Description	Balance at Beginning of Year	Balance at End of Year	Line No.
	Utility Plant			
1	Utility Plant	$271,707	$303,707	1
2	Less: Accumulated Depreciation and Amortization	208,239	222,235	2
3	Net Utility Plant	63,468	81,472	3
	Other Property and Investments			
4	Special Funds	0	0	4
5	Total Other Property and Investments	0	0	5
	Current and Accrued Assets			
6	Cash - Unrestricted	112,442	90,744	6
7	- Restricted for payment of debt service	23,533	24,400	7
8	- Restricted for market participants	217,000	217,000	8
9	Customer Accounts Receivable	0	0	9
10	Prepayments	320	320	10
11	Accrued Utility Revenues	60,018	63,583	11
12	Total Current and Accrued Assets	413,313	396,047	12
	Deferred Debits			
13	Unamortized Debt Expense	358	210	13
14	Other	0	0	14
15	Total Deferred Debits	358	210	15
16	Total Assets and Other Debits	$477,140	$477,729	16

Note:
Line 8
Comprised of funds to be distributed to market participants pending resolution of PX, PG&E bankruptcies.

California Independent System Operator
Statement AA
Balance Sheet
December 31, 2004
Unaudited
In Thousands

Line No.	Account Description	Balance at Beginning of Year	Balance at End of Year	Line No.
	Proprietary Capital			
17	Unappropriated Retained Earnings	($6,182)	$40,954	17
18	Total Proprietary Capital	(6,182)	40,954	18
	Long-Term Debt			
19	Bonds	159,700	123,100	19
20	Other Long Term Debt (Market Value of Interest Rate Swap)	6,994	0	20
21	Notes Payable	0	0	21
22	Net Long-Term Debt	166,694	123,100	22
	Current and Accrued Liabilities			
23	Accounts Payable	9,417	10,914	23
23	Long Term Debt due within one year	35,300	36,600	23
24	Taxes Accrued	0	0	24
25	Customer Deposits	1,000	1,000	25
26	Due to Market Participants	216,000	216,000	26
27	Interest Accrued	0	0	27
28	Customer Accounts Payable: GMC Related Matters	8,633	0	28
29	Amendment 33 Fines Subject to Refund (w/Interest)	45,629	47,682	29
30	Total Current and Accrued Liabilities	315,979	312,196	30
	Deferred Credits			
31	Other	649	1,480	31
	Total Deferred Credits	649	1,480	
32	Total Liabilities and Other Credits	$477,140	$477,730	32
	Difference	(0)	1	

Note:
Line 26: Comprised of funds to be distributed to market participants pending resolution of PX, PG&E bankruptcies.
Line 28: Potential GMC related refunds for 2001 case, other matters.

California Independent System Operator
Statement AB
Income Statement
For the Period Ending December 31, 2004
Unaudited
In Thousands

Line No.	Account Description	Balance at End of Year	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations	Line No.
	Utility Operating Income								
1	Operating Revenues	$219,675	$86,456	$63,860	$19,747	$14,900	$34,031	$681	1
2	Operating Expenses:								2
3	Operating Expenses	117,667	50,879	22,266	6,014	3,493	8,873	26,141	3
4	Maintenance Expenses	33,427	11,855	2,136	4,059	2,687	5,950	6,740	4
5	Depreciation Expenses	13,996	4,687	1,110	2,136	726	1,321	4,016	5
6	Taxes Other Than Income Taxes	641	261	104	43	27	65	141	6
7	Total Utility Operating Expenses	165,731	67,682	25,616	12,252	6,934	16,210	37,038	7
8	Net Utility Operating Income	53,944	18,774	38,244	7,495	7,966	17,821	(36,356)	8
	Other Income and Deductions								
9	Interest Income	840	308	103	78	42	96	212	9
10	Miscellaneous Non-operating Income	0	0	0	0	0	0	0	10
11	Miscellaneous Income Deductions	0	0	0	0	0	0	0	
12	Total Other income and Deductions	840	308	103	78	42	96	212	
	Interest Charges								
13	Interest on Long-term Debt	7,525	2,520	597	1,148	391	711	2,159	13
14	Amortization of Debt Discount and Expense	123	41	10	19	6	12	35	14
15	Other Interest Expense	0	0	0	0	0	0	0	15
16	Total Interest Charges	7,649	2,561	607	1,167	397	722	2,194	16
17	Adjustments/Reallocations								
	Settlement, Metering, Client Relations Costs	0	0	36,082	0	4,220	10,993	(51,295)	
18	Net Income	$47,136	$16,521	$1,659	$6,407	$3,390	$6,202	$12,957	18

Note:

California ISO calculates its rates using the debt service coverage principle. Depreciation is not used in the calculation.
Instead, actual debt service principal and interest costs are recovered through the rate.
"Net income" is prior to cash funded capital expenditures, and the difference between debt service and depreciation expense. "Net income" is higher than in previous years as depreciation expense is now less than debt service. Depreciation expense exceeded debt service in earlier years, and now this has reversed.
Accordingly, this statement is not the basis upon which the GMC rates are calculated.

California Independent System Operator
Statement AC
Retained Earnings
December 31, 2004
Unaudited
In Thousands

Line No.	Account Description	Amount	Line No.
	Unappropriated Retained Earnings		
1	Unappropriated Retained Earnings - Beginning of Year	($6,182)	1
2	Balance Transferred from Income (Account 433)	47,136	2
3	Appropriations of Retained Earnings (Account 436)	0	3
4	Unappropriated Retained Earnings - End of Year	$40,954	4
	Appropriated Retained Earnings		
5	Appropriated Retained Earnings - Beginning of Year	$0	5
6	Increase in Appropriations of Retained Earnings	0	6
7	Decrease in Appropriations of Retained Earnings	0	7
8	Appropriated Retained Earnings - End of Year	$0	8

Note:
As a not-for-profit, public benefit corporation, the California ISO does not have "retained earnings" in the sense that this term is typically used.

California Independent System Operator
Statement AD
Cost of Plant
December 31, 2004
In Thousands

Line No.	Functional Classification	Average Balance	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations	Line No.
1	Transmission	$0	$0	$0	$0	$0	$0	$0	1
2	Intangible	219,677	112,035	26,361	26,361	26,361	26,361	26,361	2
3	General	68,030	34,695	8,164	8,164	8,164	8,164	8,164	3
4	Total Plant	$287,707	$146,730	$34,525	$34,525	$34,525	$34,525	$34,525	4

		Balance 12/31/03	Balance 12/31/04	Simple Average 1/	
5	Transmission	$0	$0	$0	5
6	Intangible	209,997	229,357	219,677	6
7	General	61,710	74,350	68,030	7
	Total	271,707	303,707		

1/ Averages for Transmission, Intangibles and General are based on a beginning-of-period, and end-of-period simple average.

Line 2
Includes internally-developed software and off-the-shelf software.

Line 6, 7 Includes CWIP allocated 80% and 20% respectively.

California Independent System Operator
Statement AE
Accumulated Depreciation and Amortization
December 31, 2004
In Thousands

Line No.	Functional Classification	Average Balance	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations	Line No.
1	Transmission	$0	$0	$0	$0	$0	$0	$0	1
2	Intangible	172,917	57,902	13,714	26,390	8,979	16,326	49,606	2
3	General	42,321	14,171	3,356	6,459	2,198	3,996	12,141	3
	Total Accumulated Depreciation and Amortization	$215,237	$72,073	$17,070	$32,849	$11,177	$20,322	$61,747	

		Balance		Simple	
		12/31/03	12/31/04	Average 1/	
4	Transmission	$0	$0	$0	4
5	Intangible	169,398	176,435	172,917	5
6	General	38,841	45,800	42,321	6

Notes:

1/ Averages for Accumulated Depreciation and Amortization are based on a beginning-of-period, and end-of-period simple average.

2/ Allocated using 2004 debt service allocation factors: 33% 8% 15% 5% 9% 29%

California Independent System Operator
Statement AF
Deferred Credits
December 31, 2004
Unaudited
In Thousands

Line No.	Account Description	Amount	Line No.
1	Post-retirement Liability	$ 1,492	1
2	Supplemental Executive Retirement Plan Liability	(12)	2
3	Total Deferred Credits	1,480	3

California Independent System Operator
Statement AG
Specified Plant Accounts and Deferred Debits
December 31, 2004
In Thousands

Line No.	Functional Classification	Balance 12/31/03	Balance 12/31/04	Average 1/ Balance	Line No.
	Account 181 - Unamortized Debt Expense				
1	General	$358	$210	$284	1
2	Total - Specified Plant Accounts and Deferred Debits	$358	$210	$284	2

1/ Averages for Deferred Debits are based on a beginning-of-period, and end-of-period simple average.

California Independent System Operator
Statement AH
Operation and Maintenance Expenses
December 31, 2004
In Thousands

Line No.	Description	Amount	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations	Line No.
1	Transmission	$52,122	$27,709	$11,343	$2,870	$2,092	$4,884	$3,226	1
2	Customer Accounts	9,163	2,147	299	(6)	(6)	204	6,526	2
3	Customer Service and Informational	2,367	0	0	0	0	0	2,367	3
4	Administrative and General	87,442	32,878	12,760	7,210	4,096	9,736	20,762	4
5	Total	$151,094	$62,734	$24,402	$10,073	$6,181	$14,823	$32,881	5

California Independent System Operator
Statement AH
Operation and Maintenance Expenses
December 31, 2004
In Thousands

Line No.	FERC Account	Description	Amount	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations	Line No.
		Transmission Expenses - Operation								
1	560	Operation Supervision and Engineering	$2,343	$1,458	$885	$0	$0	$0	$0	1
2	561	Load Dispatching	$36,109	$21,651	$10,147	$964	$305	$927	$2,115	2
3	566	Miscellaneous Transmission Expenses	$0	$0	$0	$0	$0	$0	$0	3
4		Total Operation	$38,451	$23,108	$11,032	$964	$305	$927	$2,115	4
		Transmission Expenses - Maintenance								
5	568	Maintenance Supervision and Engineering	$13,671	$4,601	$311	$1,905	$1,787	$3,957	$1,110	5
6		Total Maintenance	$13,671	$4,601	$311	$1,905	$1,787	$3,957	$1,110	6
7		Total Transmission Expenses	$52,122	$27,709	$11,343	$2,870	$2,092	$4,884	$3,226	7

California Independent System Operator
Statement AH
Electric Operating and Maintenance Expenses
December 31, 2004
In Thousands

Line No.	FERC Account	Description	Amount	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations	Line No.
		Customer Accounts Expenses - Operation								
8	901	Supervision	($146)	($25)	($4)	($14)	($14)	($30)	($60)	8
9	902	Meter Reading Expenses	$3,001	$591	$1	$0	$0	$218	$2,190	9
10	903	Customer Record and Collection Expenses	$5,697	$1,581	$302	$7	$7	$15	$3,785	10
11	905	Miscellaneous Customer Accounts Expenses	$611	$0	$0	$0	$0	$0	$611	11
12		Total Customer Accounts Expenses	$9,163	$2,147	$299	($6)	($6)	$204	$6,526	12
		Customer Service and Informational Expenses - Operation								
13	907	Supervision	$0	$0	$0	$0	$0	$0	$0	13
14	908	Customer Assistance Expenses	$2,367	$0	$0	$0	$0	$0	$2,367	14
15	909	Informational and Instructional Advertising Expen	$0	$0	$0	$0	$0	$0	$0	15
16		Total Customer Service - Informational Expen:	$2,367	$0	$0	$0	$0	$0	$2,367	16

California Independent System Operator
Statement AH
Electric Operating and Maintenance Expenses
December 31, 2004
In Thousands

Line No.	FERC Account	Description	Amount	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations	Line No.
		Administrative and General Expenses - Operation								
17	920	Administrative and General Salaries	$30,593	$10,904	$4,592	$2,492	$1,435	$3,703	$7,466	17
18	921	Office Supplies and Expenses	$6,007	$2,355	$831	$566	$217	$596	$1,442	18
19	923	Outside Services Employed	$16,437	$6,627	$3,301	$819	$937	$2,004	$2,748	19
20	924	Property Insurance	$2,240	$986	$482	$85	$103	$234	$350	20
21	925	Injuries and Damage	$10	$4	$2	$0	$0	$1	$2	21
22	928	Regulatory Commission Expenses	$0	$0	$0	$0	$0	$0	$0	22
23	930	Miscellaneous General Expenses	$521	$229	$112	$20	$24	$54	$82	23
24	931	Rents	$11,879	$4,518	$1,615	$1,074	$479	$1,151	$3,043	24
25		Total Operation	$67,686	$25,623	$10,935	$5,056	$3,195	$7,743	$15,133	25
		Administrative and General Expenses - Maintenance								
26	935	Maintenance of General Plant	$19,756	$7,255	$1,825	$2,154	$901	$1,993	$5,629	26
27		Total Maintenance	$19,756	$7,255	$1,825	$2,154	$901	$1,993	$5,629	27
28		Total Administrative and General Expense	$87,442	$32,878	$12,760	$7,210	$4,096	$9,736	$20,762	28
29		Total Operating and Maintenance Expense	$151,094	$62,734	$24,402	$10,073	$6,181	$14,823	$32,881	29

California Independent System Operator
Statement AH
Operation and Maintenance Expenses
Itemization of General Advertising Expenses - Account 930.1
December 31, 2004
In Thousands

Line No.	FERC Account	Description	Total	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations	Line No.
1	930	Recruiting/ Advertising	50	22	11	2	2	5	8	1
2		Total	$50	$22	$11	$2	$2	$5	$8	2

California Independent System Operator
Statement AH
Operation and Maintenance Expenses
Itemization of Miscellaneous General Expenses - Account 930.2
December 31, 2004
In Thousands

Line No.		Description	Total	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations	Line No.
1	930	Board Compensation and Expenses	231	101	50	9	11	24	36	1
2		Total	$231	$101	$50	$9	$11	$24	$36	2

California Independent System Operator
Statement AI
Wages and Salaries
December 31, 2004
In Thousands

Line No.	Description	Amount	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations	Line No.
1	Transmission	$40,111	$23,405	$8,717	$1,947	$1,800	$2,733	$1,510	1
2	Customer Accounts	7,537	1,960	0	2	2	206	5,366	2
3	Customer Service and Informational	2,077	-	-	-	-	-	2,077	3
4	Administrative and General	29,711	10,645	4,332	2,488	1,313	3,597	7,335	4
5	Total	$79,435	$36,009	$13,050	$4,437	$3,114	$6,537	$16,289	5

Note:
Salaries and wages include "headcount vacancy factors" reflecting that not all budgeted positions will be occupied during 2004, and that some savings may result.
Headcount vacancy factors are budgeted by ISO Division as follows:

ISO Division	Vacancy Factor
1100	(109,541)
1300	(89,243)
1400	(485,649)
1500	(649,868)
1600	(190,702)
1700	(385,445)
1800	(99,551)
Total	(2,009,999)

California Independent System Operator
Statement AI
Wages and Salaries
December 31, 2004
In Thousands

Line No.	FERC Account	Description	Amount	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations	Line No.
		Transmission Expenses - Operation								
1	560	Operation Supervision and Engineering	$2,093	$1,296	$797	$0	$0	$0	$0	1
2	561	Load Dispatching	$26,692	$17,939	$7,621	$169	$133	$345	$485	2
3	566	Miscellaneous Transmission Expenses	$0	$0	$0	$0	$0	$0	$0	3
4		Total Operation	$28,785	$19,235	$8,418	$169	$133	$345	$485	4
		Transmission Expenses - Maintenance								
5	568	Maintenance Supervision and Engineering	$11,326	$4,170	$299	$1,778	$1,667	$2,387	$1,025	5
6		Total Maintenance	$11,326	$4,170	$299	$1,778	$1,667	$2,387	$1,025	6
7		Total Transmission Salary Expenses	$40,111	$23,405	$8,717	$1,947	$1,800	$2,733	$1,510	7

California Independent System Operator
Statement AI
Electric Wages and Salaries
December 31, 2004
In Thousands

Line No.	FERC Account	Description	Amount	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations	Line No.
		Customer Accounts Expenses - Operation								
8	901	Supervision	($57)	($10)	($1)	($5)	($5)	($12)	($24)	8
9	902	Meter Reading Expenses	$2,406	$462	$0	$0	$0	$203	$1,741	9
10	903	Customer Record and Collection Expenses	$4,584	$1,507	$2	$7	$7	$15	$3,045	10
11	905	Miscellaneous Customer Accounts Expenses	$604	$0	$0	$0	$0	$0	$604	11
12		Total Customer Accounts Expenses	$7,537	$1,960	$0	$2	$2	$206	$5,366	12
		Customer Service and Informational Expenses - Operation								
13	907	Supervision	$0	$0	$0	$0	$0	$0	$0	13
14	908	Customer Assistance Expenses	$2,077	$0	$0	$0	$0	$0	$2,077	14
15		Total Customer Service - Informational Expenses	$2,077	$0	$0	$0	$0	$0	$2,077	15

California Independent System Operator
Statement AI
Wages and Salaries
December 31, 2004
In Thousands

Line No.	FERC Account	Description	Amount	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations	Line No.
		Administrative and General Expenses - Operation								
16	920	Administrative and General Salaries	$29,711	$10,645	$4,332	$2,488	$1,313	$3,597	$7,335	16
17	921	Office Supplies and Expenses	$0	$0	$0	$0	$0	$0	$0	17
18		Total Operation	$29,711	$10,645	$4,332	$2,488	$1,313	$3,597	$7,335	18
		Administrative and General Expenses - Maintenance								
19	935	Maintenance of General Plant	$0	$0	$0	$0	$0	$0	$0	19
20		Total Maintenance	$0	$0	$0	$0	$0	$0	$0	20
21		Total Administrative and General Salary Expense	$29,711	$10,645	$4,332	$2,488	$1,313	$3,597	$7,335	21
22		Total Operating and Maintenance Salary Expens	$79,435	$36,009	$13,050	$4,437	$3,114	$6,537	$16,289	22

California Independent System Operator
Statement AJ
Depreciation and Amortization Expenses
December 31, 2004
In Thousands

Line No.	Functional Classification	2004 Average Depreciable Cost of Plant	Annual Depreciation Rate	Amount of Expense	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations	Line No.
1	Transmission	$0	0.00%	$0	$0	$0	$0	$0	$0	$0	1
2	General	68,030	10.23%	6,960	2,331	552	1,062	361	657	1,997	2
3	Intangibles	219,677	3.20%	7,036	2,356	558	1,074	365	664	2,019	3
4	Total	$287,707		$13,996	$4,687	$1,110	$2,136	$726	$1,321	$4,016	4

Note:

	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations
Allocated using 2004 debt service allocation factors:	33%	8%	15%	5%	9%	29%

Depreciation amounts are relatively small as many assets are fully depreciated.

California Independent System Operator
Statement AK
Taxes Other Than Income Taxes
December 31, 2004
In Thousands

Line No.	Account Description	Total	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations	Line No.
1	Property Taxes	641	261	104	43	27	65	141	1
2	Total Taxes Other Than Income Taxes	$641	$261	$104	$43	$27	$65	$141	2
	Employer Payroll Taxes								
3	FICA	$2,439							3
4	Medicare	885							4
5	California State Tax	101							5
6	Total Taxes	$3,425							6

California Independent System Operator
Statement AL
Working Capital
December 31, 2004
In Thousands

Line No.	Month/Year	Average Working Cash	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relation:	Line No.
1	December-03	$23,259	$ 9,074	$ 6,806	2,104	$ 1,588	$ 3,627	$ 60	1
2	January-04	33,540	13,085	9,814	3,035	2,290	5,230	86	2
3	February-04	23,900	9,324	6,993	2,163	1,632	3,727	61	3
4	March-04	15,728	6,136	4,602	1,423	1,074	2,453	40	4
5	April-04	16,824	6,564	4,923	1,522	1,149	2,623	43	5
6	May-04	17,949	7,003	5,252	1,624	1,225	2,799	46	6
7	June-04	21,388	8,344	6,258	1,935	1,460	3,335	55	7
8	July-04	18,520	7,225	5,419	1,676	1,264	2,888	48	8
9	August-04	21,144	8,249	6,187	1,913	1,444	3,297	54	9
10	September-04	24,606	9,600	7,200	2,226	1,680	3,837	63	10
11	October-04	28,593	11,155	8,366	2,587	1,952	4,458	74	11
12	November-04	32,707	12,760	9,570	2,959	2,233	5,100	84	12
13	December-04	33,709	13,151	9,864	3,050	2,301	5,256	87	13
14	13-Month Total	$311,868	$121,670	$91,255	$28,218	$21,292	$48,630	$802	14
15	13-Month Average	$23,990	$9,359	$7,020	$2,171	$1,638	$3,741	$62	15

Note:
Average working cash approximates ISO Financial & Capital Operating Reserve balance.
Excludes amounts set aside for refund (Amendment 33 fines) or extraordinary expenses (reserves for litigation, etc.)
Allocated amounts to GMC service categories are post-reassignment of Settlements, Metering & Client Relations costs to other categories.

California Independent System Operator
Statement AM
Construction Work in Process
December 31, 2004
In Thousands

Line No.	Functional Classification	Average Balance	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations	Line No.
1	Transmission	$0	$0	$0	$0	$0	$0	$0	1
2	Intangible	28,966	9,700	2,297	4,421	1,504	2,735	8,310	2
3	General	7,242	2,425	574	1,105	376	684	2,077	3
4	Total Plant	36,208	$12,125	$2,871	$5,526	$1,880	$3,419	$10,387	4

Line No.		Balance 12/31/03	Balance 12/31/04	Simple Average 1/	Line No.
5	Intangible	24,286	33,646	28,966	5
6	General	6,072	8,412	7,242	6
	Total	30,358	42,058	36,208	

1/ Averages for Construction Work in Process are based on a beginning-of-period, and end-of-period simple average.

2/ Allocated using 2004 debt service allocation factors: 33% 8% 15% 5% 9% 29%

California Independent System Operator
Statement AN
Notes Payable
December 31, 2004
In Thousands

Line No.	Date		Amount	Line No.
1	01/01/04		$0	1
2	01/31/04		0	2
3	02/28/04		0	3
4	03/31/04		0	4
5	04/30/04		0	5
6	05/31/04		0	6
7	06/30/04		0	7
8	07/31/04		0	8
9	08/31/04		0	9
10	09/30/04		0	10
11	10/31/04		0	11
12	11/30/04		0	12
13	12/31/04		0	13
14		Total	$0	14
15		Average Balance	$0	15

California Independent System Operator
Statement AO
Rate for Allowance for Funds Used During Construction

This Statement was not prepared because the ISO does not intend to request a return on funds used during construction.

California Independent System Operator
Statement AP
Federal Income Tax Deductions - Interest

This Statement was not prepared because the ISO is tax-exempt under section 501(c)(3) of the Internal Revenue Code.

California Independent System Operator
Statement AQ
Federal Income Tax Deductions - Other than Interest

This Statement was not prepared because the ISO is tax-exempt under section 501(c)(3) of the Internal Revenue Code.

California Independent System Operator
Statement AR
Federal Tax Adjustments

This Statement was not prepared because the ISO is tax-exempt under section 501(c)(3) of the Internal Revenue Code.

California Independent System Operator
Statement AS
Additional State Income Tax Deduction

This Statement was not prepared because the ISO is tax-exempt under section 501(c)(3) of the Internal Revenue Code.

California Independent System Operator
Statement AT
State Tax Adjustments

This Statement was not prepared because the ISO is tax-exempt under section 501(c)(3) of the Internal Revenue Code.

California Independent System Operator
Statement AU
Revenue Credits
December 31, 2004
In Thousands

Line No.	FERC Account	Description	Amount	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations	Line No.
1	456	Other Operating Revenue								1
2		Grid Management Charge	218,243	85,144	63,860	19,747	14,900	34,031	561	2
3		WECC Security Coordinator Fees	1,313	1,313	0	0	0	0	0	3
4		SC Application Fees & Training Fees	120	0	0	0	0	0	120	4
5		Fines and Penalties	0	0	0	0	0	0	0	5
6		Total Operating Revenue (Account 456)	$219,675	$86,456	$63,860	$19,747	$14,900	$34,031	$681	6
7		Total Revenue Credits	$219,675	$86,456	$63,860	$19,747	$14,900	$34,031	$681	7

Note:

Not shown explicitly above is a credit or unrecovered balance applied to the 2004 revenue requirement resulting from the operating reserve position of each service as of 12/31/2003.

The ISO's GMC contains a provision for the collection of funds for an operating reserve, which is funded from ongoing collections equal to 25% of debt service payments.

The operating reserve is considered fully funded when it reaches a level of 15% of the following year's operating & maintenance budget. At year end, any operating reserve balance in excess of this 15% requirement may be applied as a credit toward the following year's revenue requirement, and any deficiency recovered.

For 12/31/2003, the operating reserve credit or deficiency was calculated as follows:

Line	Description	Amount	Core Reliability Services	Energy & Transmission Services	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations	Statement
8	Total FY2004 Operating & Maintenance Budget:	$ 151,735	$ 62,995	$ 24,506	$ 10,116	$ 6,208	$ 14,889	$ 33,022	2004 GMC Summary
9	Net Operating Budget	$ 151,735	$ 62,995	$ 24,506	$ 10,116	$ 6,208	$ 14,889	$ 33,022	Calculation
10	Target Operating Reserve Requirement, 15% of Above	$ 22,760	$ 9,449	$ 3,676	$ 1,517	$ 931	$ 2,233	$ 4,953	15% of above
11	Projected Operating Reserve Balance, 12/31/2003:	$ 40,595	$ 10,013	$ 5,091	$ 3,942	$ 2,051	$ 6,442	$ 13,057	Separate Analysis
12	Difference: Available for Revenue Credit or (shortfall)	$ 17,835	$ 564	$ 1,415	$ 2,425	$ 1,120	$ 4,209	$ 8,103	
13	This revenue credit is applied as a credit toward 2004 costs as follows:								
14	Total FY2004 Operating & Maintenance Budget:	$ 151,735	$ 62,995	$ 24,506	$ 10,116	$ 6,208	$ 14,889	$ 33,022	Statement BK
15	Required Debt Service Collections	$ 43,692	$ 14,630	$ 3,465	$ 6,668	$ 2,269	$ 4,125	$ 12,534	Statement BK
16	Required Operating Reserve Collection, 2001 (25% of Debt Ser	$ 10,923	$ 3,658	$ 866	$ 1,667	$ 567	$ 1,031	$ 3,134	25% of above line
17	Cash Funded Capital Expenditures	$ 32,000	$ 6,044	$ 459	$ 3,799	$ 2,797	$ 7,297	$ 11,603	
18	Less: WECC Security Coordinator Fees	$ (1,313)	$ (1,313)						AU, Line 3 above
19	Less: SC App. Fees	$ (120)	$ -	$ -	$ -	$ -	$ -	$ (120)	AU, Line 4 above
20	Less: Interest Income	$ (840)	($308)	($103)	($78)	($42)	($96)	($212)	Statement BK
21	Subtotal: Required Collections before revenue credit/debit	$ 236,078	$ 85,707	$ 29,193	$ 22,172	$ 11,799	$ 27,246	$ 59,960	
22	Plus: Available Revenue Credit/Debit	(17,835)	(564)	(1,415)	(2,425)	(1,120)	(4,209)	(8,103)	Above
23	Equals: Total Revenue Requirement prior to adj.	218,243	85,144	27,778	19,747	10,680	23,038	51,857	
24	Functional Association of S, M & CR	0	0	36,082	0	4,220	10,993	(51,295)	
25	Equals: Adj. Revenue Requirement	218,243	85,144	63,860	19,747	14,900	34,031	561	

Notes:

Line 25 Functional association of Settlements, Metering & Client Relations revenue requirement. Costs are reallocated to other service categories.

California Independent System Operator
Statement AV
Rate of Return
December 31, 2004
In Thousands

Line No.	Component	Average Capitalization Amount	Capitalization Ratio	Component Cost	Weighted Component Cost	Line No.
1	Long-Term Debt	$123,100	100%	5.41%	5.41%	1

Long Term Debt Reconciliation:

Debt Outstanding at 1/1/2004:	195,000
Debt Retired During 2004:	(35,300)
Debt Issuance Planned During 2004:	-
Total Debt Outstanding 12/31/2004:	159,700

Average capital cost noted above is calculated by dividing interest expense by average outstanding debt.
Budgeted interest expense costs for 2004 consist of the following:

	Series 2000A&B	Series 2000C	
Status:	Hedged	Unhedged	
Rate:	4.38%	2.7%	Unswapped rate--average from 4/2000 to July 2003, is 2.71%.
Negative Carry with new swap:	0.02%		
Insurance Premium	0.05%	0.05%	
Remarketing Fee	0.08%	0.08%	
Liquidity Facility Commitment Fee	0.50%	0.50%	
California Trading Value	0.01%		Basis differential from July 2002 - July 2003 , is .01 (unfavorable)
Effective Interest Rate	5.04%	3.34%	

California Independent System Operator
Statement AW
Cost of Short-Term Debt
December 31, 2004
In Thousands

Line No.	Type of Short-term Financing	Balance End of Year 12/31/04	Interest Rate	Interest Charges on an Annual Basis	Line No.
1	Line of Credit	$0	n/a	0	1
2	Total, All Short-Term Debt	$0	n/a	0	2

Note:
The ISO does anticipate incurring short-term debt costs in 2004.

California Independent System Operator
Statement AX
Other Recent and Pending Rate Changes

No pending rate changes, other than those contained in this filing, are outstanding.

See Statement BG, BH

California Independent System Operator
Statement AY
Income and Revenue Tax Rate Data

This Statement was not prepared because the ISO is tax-exempt under section 501(c)(3) of the Internal Revenue Code.

California Independent System Operator
Statement BA
Wholesale Customer Rate Groups

1. Grid Reliability Services -	Under Grid Reliability Services, the California ISO provides safe, reliable operation and maintenance of the Control Area, provision for transmission expansion, coordination with neighboring Control Areas, management of transmission flows and compliance with regional and national reliability standards.
a. Core Reliability Services (CRS)	This service provides for reliable operation of a Control Area surrounded by other control areas and achieving minimal disruptions to system operation. In this sub-function, the ISO provides a stable grid and meets regional and national regulatory requirements, such as NERC and WECC reliability criteria and some FERC requirements (e.g., a basic level of transmission planning). All necessary activities attributable to Control Area operation including the capability of handling a system that is as geographically dispersed as the present system but without features that are scalable (i.e., that vary according to use or size of flow) are contained in this function. However, only a basic level of activity is contained in this service. The level of activity does not represent fully functioning operations for a robust Control Area in which there are outages and growth as new generation and transmission projects are developed.
b. Energy Transmission Services (ETS)	This service represents the *scalable* portion of Grid Reliability Services, and is a function of the intensity of use of the transmission system within the Control Area and the occurrence of system outages and disruptions (e.g., weather-related incidents). ETS is further subdivided into two categories: Energy Transmission Services Net Energy and Energy Transmission Services Uninstructed Deviations.
2. Market Services	Under Market Services, the California ISO provides access to its scheduling infrastructure, manages congestion to facilitate transmission flows, operates and maintains California ISO markets for participants, and monitors market performance. Contained in this function are activities related to the maintenance, monitoring, operation and performance of the forward and Real-Time markets. These activities span many of the activities within the California ISO's current Congestion Management and Ancillary Services/Real-Time Energy Operations services.
a. Forward Scheduling	The California ISO provides SCs with the ability to forward schedule energy and Ancillary Services and the processing of accepted Ancillary Services bids. In this context, a schedule is represented by a scheduling template (import, export, load, generation, inter-SC trade and Ancillary Services, including self-provided AS) submitted to the California ISO Scheduling Infrastructure.
b. Congestion Management (CONG)	The California ISO provides management and operation of inter-zonal congestion markets, using adjustment bids, taking Firm Transmission Rights and Existing Transmission Contracts into account, and determining the price for mitigating congestion for flows on congested paths. Congestion exists when power flowing on a transmission path exceeds the transmission path capacity. Congestion management is conducted by the California ISO during the scheduling process and results in the economic rationing of transmission service in order to prevent congestion. This currently provides for only inter-zonal congestion. Intra-zonal congestion is managed in real-time and thus incorporated in Core Reliability Services.
c. Market Usage	In this sub-function of Market Services, the California ISO processes supplemental energy and Ancillary Service bids, maintains and controls the Open Access Same-Time Information System (OASIS), monitors market performance, ensures generator compliance with market protocols, and determines market clearing prices. In the future, activities associated with forward energy markets will be included here.
3. Settlements, Metering and Client Relations (CS)	Under Settlements, Metering and Client Relations, the California ISO maintains customer accounts data, provides account information to customers, responds to customer inquiries, calculates market charges, processes settlement statements, resolves customer disputes and provides customer training. This function includes Settlements, Billing, and Metering activities as well as Client Relations. Some portion of Settlements activities are assigned to other functions. For example, RMR Settlements is assigned to CRS because its activities are related to the maintenance and provision of RMR services to the Control Area.

Notes:
The above are not wholesale customer rate groups per se, but are the categories of service provided by the California ISO.

Wholesale customers include: generators, municipal utilities, investor owned utilities, power marketers, others. The rate design is not based on customer those classes.

Additionally, the ISO provides services to Scheduling Coordinators and other participants, including non-market participants, and FTR holders.

California Independent System Operator
Statement BB
Allocation of Demand and Capability Data

The billing determinants for the 2004 GMC service categories are set forth on Statement BD.

California Independent System Operator
Statement BC
Reliability Data

The California ISO does not maintain data for generating capacity reserves.

California Independent System Operator
Statement BD
Allocation of Energy and Supporting Data

Period II
Billable Quantities (MWh)

Line No.	Service	Core Reliability Services	Energy & Transmission Services: Energy	Energy & Transmission Services: Deviations	Forward Scheduling	Congestion Management	Market Usage	Settlements, Metering & Client Relations	Line No.
	Billing Determinant	Total of the forecasted Scheduling Coordinators' metered non-coincident peak hourly demand in MWs for all months during the year	Forecast Metered Controlled Grid Load in MWh.	Forecast net uninstructed deviations (netted within a settlement interval) in MWh	Forecast number of non zero MW final Hour-Ahead schedules	Forecast Scheduling Coordinators' inter-zonal scheduled flow (excluding flows pursuant to Existing Contracts) per path in MWh	Forecast total purchases and sales (including out-of-market transactions) of Ancillary Services, Supplemental Energy, Instructed Imbalance Energy, and net Uninstructed Imbalance Energy in MWh	Number of Active Scheduling Coordinator Identification Numbers	
	Month								
1	Jan	40,084	19,774,981	1,394,233	997,193	7,283,735	3,722,936	86	1
2	Feb	38,667	17,503,991	999,377	958,235	6,508,342	3,129,057	90	2
3	Mar	37,283	19,157,776	1,060,660	1,064,372	6,840,736	3,453,272	91	3
4	Apr	38,187	18,577,016	1,260,659	1,039,915	7,700,138	3,408,874	89	4
5	May	44,181	19,906,921	1,429,763	1,111,833	7,208,767	3,670,237	90	5
6	Jun	51,296	21,423,384	1,676,296	1,102,877	8,463,639	3,960,411	93	6
7	Jul	55,063	23,942,778	1,859,255	1,177,553	9,550,844	4,056,288	96	7
8	Aug	50,593	23,103,872	1,792,778	1,169,631	8,732,302	3,711,484	94	8
9	Sep	51,028	21,624,459	1,844,998	1,171,821	8,085,423	3,770,703	93	9
10	Oct	42,431	19,697,142	1,434,983	1,195,054	7,460,465	2,985,170	89	10
11	Nov	41,552	19,000,561	1,824,792	1,132,108	7,334,411	3,357,911	101	11
12	Dec	40,306	20,038,351	1,762,124	1,141,100	7,156,023	3,436,327	111	12
13	Total	530,670	243,751,234	18,339,917	13,261,692	92,324,825	42,662,669	1,122	13
14	Average	44,223	20,312,603	1,528,326	1,105,141	7,693,735	3,555,222	94	14

Notes:

/ Support for calculations is contained in Barkovich & Yap testimony.

California Independent System Operator
Statement BE
Specific Assignment Data

See Statement BK for the results of the allocation of ISO costs into GMC service categories.

California Independent System Operator
Statement BF
Exclusive Use Commitments of Major Power Supply Facilities

This statement is not applicable to the California ISO. It owns no generation and has no exclusive use commitments.

California Independent System Operator
Statement BG
Revenue Data to Reflect Changed Rates
Actual Units (not in '000)

Period II
Billable Quantities

Line No.		Core Reliability Services	Energy & Transmission Services: Energy	Energy & Transmission Services: Deviations	Forward Scheduling	Congestion Management	Market Usage	Settlements, Metering & Client Relations
	Units	MW in '000	MWh	MWh	Schedules	MWh	MWh	Customer Months
	Description:	Total of the forecasted Scheduling Coordinators' metered non-coincident peak hourly demand in MWs for all months during the year	Forecast Metered Controlled Grid Load in MWh.	Forecast net uninstructed deviations (netted within a settlement interval) in MWh	Forecast number of non-zero MW final Hour-Ahead schedules	Forecast Scheduling Coordinators' inter-zonal scheduled flow (excluding flows pursuant to Existing Contracts) per path in MWh	Forecast total purchases and sales (including out-of-market transactions) of Ancillary Services, Supplemental Energy, Instructed Imbalance Energy, and net Uninstructed Imbalance Energy in MWh	Number of Active Scheduling Coordinator Identification Numbers
1	Jan	40,084	19,774,981	1,394,233	997,193	7,283,735	3,722,936	86
2	Feb	38,667	17,503,991	999,377	958,235	6,508,342	3,129,057	90
3	Mar	37,283	19,157,776	1,060,660	1,064,372	6,840,736	3,453,272	91
4	Apr	38,187	18,577,016	1,260,659	1,039,915	7,700,138	3,408,874	89
5	May	44,181	19,906,921	1,429,763	1,111,833	7,208,767	3,670,237	90
6	Jun	51,296	21,423,384	1,676,296	1,102,877	8,463,639	3,960,411	93
7	Jul	55,063	23,942,778	1,859,255	1,177,553	9,550,844	4,056,288	96
8	Aug	50,593	23,103,872	1,792,778	1,169,631	8,732,302	3,711,484	94
9	Sep	51,028	21,624,459	1,844,998	1,171,821	8,085,423	3,770,703	93
10	Oct	42,431	19,697,142	1,434,983	1,195,054	7,460,465	2,985,170	89
11	Nov	41,552	19,000,561	1,824,792	1,132,108	7,334,411	3,357,911	101
12	Dec	40,306	20,038,351	1,762,124	1,141,100	7,156,023	3,436,327	111
13	Total	530,670	243,751,234	18,339,917	13,261,692	92,324,825	42,662,669	1,122

Period II
Revenues $

		Core Reliability Services	Energy & Transmission Services: Energy	Energy & Transmission Services: Deviations	Forward Scheduling	Congestion Management	Market Usage	Settlements, Metering & Client Relations	Total
14	Rate	$ 160.446	$ 0.210	$ 0.696	$ 1.489	$ 0.161	$ 0.798	$ 500.000	
	per	MW in '000	MWh	MWh	Schedules	MWh	MWh	Customer Months	
15	Jan	6,431,386	4,152,746	970,386	1,484,821	1,172,681	2,970,903	43,170	
16	Feb	6,203,886	3,675,838	695,567	1,426,812	1,047,843	2,496,988	45,020	
17	Mar	5,981,849	4,023,133	738,219	1,584,850	1,101,359	2,755,711	45,637	
18	Apr	6,126,949	3,901,173	877,419	1,548,433	1,239,722	2,720,281	44,404	
19	May	7,088,589	4,180,454	995,115	1,655,519	1,160,612	2,928,850	45,020	
20	Jun	8,230,179	4,498,911	1,166,702	1,642,184	1,362,646	3,160,408	46,254	
21	Jul	8,834,634	5,027,983	1,294,041	1,753,377	1,537,686	3,236,917	48,104	
22	Aug	8,117,428	4,851,813	1,247,773	1,741,580	1,405,901	2,961,764	46,871	
23	Sep	8,187,293	4,541,136	1,284,118	1,744,842	1,301,753	3,009,021	46,254	
24	Oct	6,807,838	4,136,400	998,748	1,779,435	1,201,135	2,382,166	44,404	
25	Nov	6,666,865	3,990,118	1,270,055	1,685,708	1,180,840	2,679,613	50,571	
26	Dec	6,467,003	4,208,054	1,226,438	1,699,098	1,152,120	2,742,189	55,505	
27		$ 85,143,898	$ 51,187,759	$ 12,764,582	$ 19,746,659	$ 14,864,297	$ 34,044,810	$ 561,213	$ 218,313,219
28	Revenue Requirement	85,143,801	51,087,845	12,771,961	19,747,044	14,900,040	34,030,944	561,213	218,242,849
29	Difference	97	99,914	(7,379)	(384)	(35,743)	13,866	0	70,370

Notes

Line 16
Minor difference between collected revenues and revenue requirement per remainder of filing is due to rounding of rates to 3 digits.

Statement demonstrates that under the proposed new rates, the California ISO anticipates that it will collect sufficient revenues from each GMC service category to meet the revenue requirement.

California Independent System Operator
Statement BH
Revenue Data to Reflect Present Rates
Actual Units (not in '000)

Line No.		Period II Billable Quantities (MWh) Control Area Services	Congestion Management	Ancillary Services and Real Time Energy Operations	Period II Revenues $ Control Area Services	Congestion Management	Ancillary Services and Real Time Energy Operations	Total
	Rate $/MWh				0.569	0.32	1.296	
1	Jan	20,216,587	7,283,735	4,498,228	11,503,238	2,330,795	5,829,703	
2	Feb	17,922,886	6,508,342	4,361,266	10,198,122	2,082,670	5,652,201	
3	Mar	19,593,209	6,840,736	4,280,679	11,148,536	2,189,036	5,547,760	
4	Apr	19,006,642	7,700,138	4,171,458	10,814,779	2,464,044	5,406,209	
5	May	20,349,846	7,208,767	4,440,951	11,579,062	2,306,806	5,755,472	
6	Jun	21,881,474	8,463,639	4,826,756	12,450,558	2,708,364	6,255,476	
7	Jul	24,426,061	9,550,844	5,388,861	13,898,429	3,056,270	6,983,963	
8	Aug	23,578,766	8,732,302	5,162,256	13,416,318	2,794,337	6,690,284	
9	Sep	22,084,559	8,085,423	4,788,164	12,566,114	2,587,335	6,205,460	
10	Oct	20,137,968	7,460,465	4,379,419	11,458,504	2,387,349	5,675,726	
11	Nov	19,434,422	7,334,411	4,416,286	11,058,186	2,347,011	5,723,507	
12	Dec	20,482,590	7,156,023	4,270,181	11,654,594	2,289,927	5,534,154	
13	Total	249,115,010	92,324,825	54,984,503	$ 141,746,441	$ 29,543,944	$ 71,259,916	$ 242,550,301

Notes/Assumptions:

1. The above are the 2003 GMC categories and rates.
2. Billable quantities are the forecast 2004 volumes for the billing determinants used in the 2003 GMC service categories.
3. The rates per MWh noted above are not adjusted for the 2004 volumes.
4. As the new rate structure is based on different service categories and rates, the above rates will not be in effect.

If the 2004 revenue requirement were recovered through the existing rate structure, the following analysis illustrates the rates that might be in effect for 2004, assuming the same allocation of costs to GMC service category as was in effect during 2003:

	Control Area Services	Congestion Management	Ancillary Services and Real Time Energy Operations	Total
Total FY2004 Operating & Maintenance Budget:	$ 94,578,300	$ 15,904,266	$ 41,252,491	$ 151,735,058
Required Debt Service Collections	$ 22,338,348	$ 5,054,859	$ 16,298,853	$ 43,692,060
Required Operating Reserve Collection, 2001 (25% of Debt Service	$ 5,584,587	$ 1,263,715	$ 4,074,713	$ 10,923,015
Cash Funded Capital Expenditures	$ 13,208,727	$ 8,170,182	$ 10,621,091	$ 32,000,000
Less: WECC Security Coordinator Fees	$ (1,312,533)	$ -	$ -	$ (1,312,533)
Less: SC App. Fees	$ (75,000)	$ (12,500)	$ (32,500)	$ (120,000)
Less: Interest Income	$ (523,323)	$ (87,891)	$ (228,786)	$ (840,000)
Subtotal: Required Collections before revenue credit/debit	$ 133,799,106	$ 30,292,631	$ 71,985,863	$ 236,077,600
Plus: Available Revenue (Credit)/Debit	2,644,799	(2,839,393)	(17,640,155)	$ (17,834,751)
Equals: Total Revenue Requirement	136,443,906	27,453,238	54,345,708	218,242,849
Divided by: Billing Determinant Forecast	249,115,010	92,324,825	54,984,503	
Pro Forma Rate	$ 0.5477	$ 0.2974	$ 0.9884	

California Independent System Operator
Statement BJ
Summary Data Tables
December 31, 2004
$ In Thousands

Line No.	Item	Total	Table	Data Source	Line No.
1	Total Plant in Service				1
2	Intangible Plant in Service	$219,677		AD	2
3	General Plant in Service	68,030		AD	3
4	Accumulated Depreciation and Amortization				4
5	Intangible Depreciation and Amortization	172,917		AE	5
6	General Depreciation and Amortization	42,321		AE	6
7	Total Deferred Credits	1,480		AF	7
8	Unamortized Debt Expense	284		AG	8
9	Transmission Expense- O&M	52,122		AH	9
10	Customer Accounts Expense	9,163		AH	10
11	Customer Service & Information Expense	2,367		AH	11
12	Administration & General Expense	87,442		AH	12
13	Transmission Expense- Labor	40,111		AI	13
14	Customer Accounts Expense - Labor	7,537		AI	14
15	Customer Service & Information Expense - Labor	2,077		AI	15
16	Administration & General Expense - Labor	29,711		AI	16
17	Transmission - Depreciation Expense	-		AJ	17
18	General - Depreciation Expense	6,960		AJ	18
19	Intangibles - Depreciation Expense	7,036		AJ	19
20	Taxes Other Than Income Taxes	641		AK	20
21	Employer Payroll Tax	3,425		AK	21
22	Working Capital: Average	24,136		AL	22
23	Construction Work In Progress- Average- Total	36,208		AM	23
24	Notes Payable - Average	-		AN	24
25	Fed Income Tax Deductions - Interest	N/A		AP	25
26	Fed Income Tax Deductions - Other than Interest	N/A		AQ	26
27	Fed Income Tax Adjustments	N/A		AR	27
28	Additional State Income Tax Deduction	N/A		AS	28
29	State Tax Adjustments	N/A		AT	29
30	Other Operating Revenues	$219,675		AU	30
31	Cost of Capital	5.41%		AV	31
32	Cost of Short Term Debt	$0		AW	32
33	Allocation of Demand and Capability Data	N/A		BB	33
34	Allocation of Energy and Supporting Data: Billing Determinant in MWh				34
35	Core Reliability Services	530,670		BD	35
36	Energy & Transmission Services: Energy	243,751,234		BD	36
37	Energy & Transmission Services: Deviations	18,339,917		BD	37
38	Forward Scheduling	13,261,692		BD	38
39	Congestion Management	92,324,825		BD	39
40	Market Usage	42,662,669		BD	40
41	Settlements, Metering & Client Relations	1,122		BD	41
42					42
43	Specific Assignment Data	N/A		BE	43
44	Revenue Data to Reflect Changed Rates				44
45	Core Reliability Services	$ 85,144		BG	45
46	Energy & Transmission Services: Energy	51,188		BG	46
47	Energy & Transmission Services: Deviations	12,765		BG	47
48	Forward Scheduling	19,747		BG	48
49	Congestion Management	14,864		BG	49
50	Market Usage	34,045		BG	50
51	Settlements, Metering & Client Relations	561		BG	51
52					52
53	Revenue Data to Reflect Existing Rates			BH	53
54	Control Area Services	$ 141,746		BH	54
55	Congestion Management	29,544		BH	55
56	Ancillary Services and Real Time Energy Operations	71,260		BH	56

California Independent System Operator

Statement BK

Electric Utility Department Cost of Service, Total and as Allocated
For the Year Ending December 31, 2004
In Thousands

Line No.	Description	Amount	Core Reliability Services	Energy & Transmission Services: Total	Energy & Transmission Services: Energy	Energy & Transmission Services: Deviations	Forward Scheduling	Congestion Management	Market Usage	Settlements Metering, Client Relations	Line No.
1	Grid Management Charge Revenue Collected (Statement AU)	$218,243	$85,144	$63,860	$51,088	$12,772	$19,747	$14,900	$34,031	$561	1
2	Operating Expenses										2
3	Transmission (Statement AH)	$52,122	$27,709	$11,343	$9,074	$2,269	$2,870	$2,092	$4,884	$3,226	3
4	Customer Accounts (Statement AH)	9,163	$2,147	$299	$240	$60	($6)	($6)	$204	$6,526	4
5	Customer Service and Informational Expenses (Statement AH)	2,367	$0	$0	$0	$0	$0	$0	$0	$2,367	5
6	Administrative and General (Statement AH)	87,442	$32,878	$12,760	$10,208	$2,552	$7,210	$4,096	$9,736	$20,762	6
7	Taxes Other Than Income Taxes (Statement AK)	641	261	104	$83	$21	43	27	65	141	7
8	Total Operating Expenses	$151,735	$62,995	$24,506	$19,605	$4,901	$10,116	$6,208	$14,889	$33,022	8
9	Less: Other Revenues										9
10	Interest Earnings	$840	$308	$103	$83	$21	$78	$42	$96	$212	10
11	Other Earnings (Statement AU)	1,433	1,313	0	$0	$0	0	0	0	120	11
12		$2,273	$1,620	$103	$83	$21	$78	$42	$96	$332	12
13	Net Operating Expenses	$149,463	$61,375	$24,403	$19,522	$4,881	$10,037	$6,166	$14,792	$32,689	13
14	Net Revenues	$68,780	$23,769	$39,457	$31,566	$7,891	$9,710	$8,734	$19,239	($32,128)	14
15	Less: Debt Service and Cash Funded CapEx (Statement BK)										15
16	Principal Reserve Funding	$36,167	$12,111	$2,868	$2,295	$574	$5,520	$1,878	$3,415	$10,375	16
17	Interest Reserve Funding	7,525	$2,520	$597	$477	$119	$1,148	$391	$711	$2,159	17
18	Cash Funded CapEx	$32,000	$6,044	$459	$367	$92	$3,799	$2,797	$7,297	$11,603	18
19	Total Debt Service and Cash Funded CapEx	$75,692	$20,675	$3,924	$3,139	$785	$10,468	$5,066	$11,423	$24,137	19
20	Functional Association of S, M & CR (Reallocation of costs)	$0	0	36,082	28,865	7,216	0	4,220	10,993	(51,295)	
21	Operating Reserve Contribution	($6,912)	$3,094	($549)	($439)	($110)	($758)	($552)	($3,177)	($4,970)	21
22	GMC Revenue Collected	$218,243	$85,144	$63,860	$51,088	$12,772	$19,747	$14,900	$34,031	$561	22
23	2004 Annual Volume (000 MWh) - By Service		531		243,751	18,340	13,262	92,325	42,663	1,122	23
24	Grid Management Charge - By Service		$160.446		$0.210	$0.696	$1.489	$0.161	$0.798	$0.500	24

Note:
The factors used to allocate total ISO costs to the categories of service are documented in the ISO's Cost Allocation Matrix

Line 16,17
Debt service is allocated to ISO service categories based on an analysis of how borrowed funds were (or are anticipated to be) spent.

Line 18
Cash funded capital expenditures of $32,000, as ability of the ISO to issue bonds in 2004 is uncertain.

Line 20
Functional Association of Settlements, Metering & Client Relations results in a reallocation of costs from this service category to others.

Line 21
The ISO collects 25% of debt service as an annual contribution to the operating reserve. As noted elsewhere,
excess revenue collected for the operating reserve may be used as a revenue credit in subsequent years. See statement AU.

The Operating Reserve Contribution for 2004 is reconciled as follows:

Total 2003 Debt Service (Line 16&17)		$43,692
Times: 25% Operating Reserve Collection		0.25
Equals: Operating Reserve Collection	$	10,923
Less: Operating Reserve Credit from 2003	$	17,835
Equals: Net Operating Reserve Collection, 2004	$	(6,912)

California Independent System Operator
Statement BK1: Support for Cost Allocations by ISO Cost Center: Total Costs
For Year Ended December 31, 2004

			Percentages						Dollars						
Center	FERC Sho	Annual Budget	Core Reliability Services (CRS)	Energy & Transmission Services (ETS)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements Metering & Client Relations (SMCR)	Core Reliability Services (CRS)	Energy & Transmission Services (ETS)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering & Client Relations (SMCR)	Total
1111	920	671,078	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 295,364	$ 144,382	$ 25,344	$ 30,951	$ 70,131	$ 104,906	$ 671,078
1111	921	76,163	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 33,522	$ 16,386	$ 2,876	$ 3,513	$ 7,959	$ 11,906	$ 76,163
1111	923	150,000	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 66,020	$ 32,272	$ 5,665	$ 6,918	$ 15,676	$ 23,449	$ 150,000
1241	561	1,284,788	7.0%	0.0%	13.9%	10.9%	28.4%	39.9%	$ 89,351	$ -	$ 178,118	$ 140,159	$ 364,559	$ 512,601	$ 1,284,788
1311	920	356,323	44.0%	21.5%	3.6%	4.2%	10.3%	16.3%	$ 156,933	$ 76,575	$ 12,913	$ 15,028	$ 36,734	$ 58,140	$ 356,323
1311	921	(24,051)	44.0%	21.5%	3.6%	4.2%	10.3%	16.3%	$ (10,593)	$ (5,169)	$ (872)	$ (1,014)	$ (2,479)	$ (3,924)	$ (24,051)
1311	923	-	44.0%	21.5%	3.6%	4.2%	10.3%	16.3%	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1321	920	921,198	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 405,450	$ 198,195	$ 34,790	$ 42,486	$ 96,270	$ 144,006	$ 921,198
1321	921	62,900	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 27,684	$ 13,533	$ 2,376	$ 2,901	$ 6,573	$ 9,833	$ 62,900
1321	923	1,947,000	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 856,939	$ 418,896	$ 73,531	$ 89,797	$ 203,471	$ 304,365	$ 1,947,000
1331	920	780,134	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 343,363	$ 167,845	$ 29,463	$ 35,980	$ 81,528	$ 121,955	$ 780,134
1331	921	31,500	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 13,864	$ 6,777	$ 1,190	$ 1,453	$ 3,292	$ 4,924	$ 31,500
1331	923	170,000	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 74,823	$ 36,575	$ 6,420	$ 7,841	$ 17,766	$ 26,575	$ 170,000
1331	924	2,240,139	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 985,960	$ 481,965	$ 84,602	$ 103,317	$ 234,105	$ 350,190	$ 2,240,139
1331	925	10,000	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 4,401	$ 2,151	$ 378	$ 461	$ 1,045	$ 1,563	$ 10,000
1331	930	240,000	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 105,632	$ 51,636	$ 9,064	$ 11,069	$ 25,081	$ 37,518	$ 240,000
1351	408	416,000	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 183,304	$ 89,324	$ 14,613	$ 16,351	$ 42,458	$ 69,949	$ 416,000
1351	920	710,066	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 312,880	$ 152,467	$ 24,943	$ 27,909	$ 72,471	$ 119,396	$ 710,066
1351	921	60,385	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 26,608	$ 12,966	$ 2,121	$ 2,373	$ 6,163	$ 10,154	$ 60,385
1351	923	62,782	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 27,664	$ 13,481	$ 2,205	$ 2,468	$ 6,408	$ 10,557	$ 62,782
1351	931	2,582,652	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 1,138,007	$ 554,553	$ 90,722	$ 101,512	$ 263,591	$ 434,267	$ 2,582,652
1351	935	2,304,415	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 1,015,406	$ 494,809	$ 80,948	$ 90,576	$ 235,194	$ 387,482	$ 2,304,415
1361	920	731,998	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 322,544	$ 157,176	$ 25,713	$ 28,771	$ 74,709	$ 123,084	$ 731,998
1361	921	627,260	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 276,393	$ 134,687	$ 22,034	$ 24,655	$ 64,020	$ 105,472	$ 627,260
1361	923	52,500	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 23,133	$ 11,273	$ 1,844	$ 2,064	$ 5,358	$ 8,828	$ 52,500
1361	931	150,000	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 66,095	$ 32,208	$ 5,269	$ 5,896	$ 15,309	$ 25,222	$ 150,000
1361	935	1,099,000	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 484,258	$ 235,980	$ 38,605	$ 43,197	$ 112,166	$ 184,794	$ 1,099,000
1411	920	(85,121)	37.5%	7.4%	11.4%	3.4%	8.8%	31.5%	$ (31,904)	$ (6,321)	$ (9,734)	$ (2,890)	$ (7,490)	$ (26,782)	$ (85,121)
1411	921	(316,791)	37.5%	7.4%	11.4%	3.4%	8.8%	31.5%	$ (118,735)	$ (23,523)	$ (36,227)	$ (10,755)	$ (27,876)	$ (99,675)	$ (316,791)
1411	923	82,550	37.5%	7.4%	11.4%	3.4%	8.8%	31.5%	$ 30,940	$ 6,130	$ 9,440	$ 2,803	$ 7,264	$ 25,974	$ 82,550
1422	920	246,402	38.6%	13.8%	3.5%	4.5%	12.3%	27.2%	$ 95,166	$ 34,017	$ 8,670	$ 11,138	$ 30,370	$ 67,040	$ 246,402
1422	921	15,000	38.6%	13.8%	3.5%	4.5%	12.3%	27.2%	$ 5,793	$ 2,071	$ 528	$ 678	$ 1,849	$ 4,081	$ 15,000
1422	923	11,000	38.6%	13.8%	3.5%	4.5%	12.3%	27.2%	$ 4,248	$ 1,519	$ 387	$ 497	$ 1,356	$ 2,993	$ 11,000
1422	935	-	38.6%	13.8%	3.5%	4.5%	12.3%	27.2%	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1424	920	936,407	34.6%	6.3%	12.5%	4.9%	10.2%	31.5%	$ 324,389	$ 59,350	$ 116,698	$ 45,750	$ 95,400	$ 294,820	$ 936,407
1424	921	369,481	34.6%	6.3%	12.5%	4.9%	10.2%	31.5%	$ 127,995	$ 23,418	$ 46,046	$ 18,052	$ 37,642	$ 116,328	$ 369,481
1424	408	225,000	34.6%	6.3%	12.5%	4.9%	10.2%	31.5%	$ 77,944	$ 14,261	$ 28,040	$ 10,993	$ 22,923	$ 70,839	$ 225,000
1424	923	330,000	34.6%	6.3%	12.5%	4.9%	10.2%	31.5%	$ 114,318	$ 20,916	$ 41,126	$ 16,123	$ 33,620	$ 103,898	$ 330,000
1424	931	3,615,000	34.6%	6.3%	12.5%	4.9%	10.2%	31.5%	$ 1,252,302	$ 229,121	$ 450,514	$ 176,619	$ 368,292	$ 1,138,152	$ 3,615,000
1424	935	14,979,443	34.6%	6.3%	12.5%	4.9%	10.2%	31.5%	$ 5,189,154	$ 949,408	$ 1,866,790	$ 731,853	$ 1,526,089	$ 4,716,149	$ 14,979,443
1431	920	524,422	37.3%	14.4%	9.5%	3.5%	9.1%	26.1%	$ 195,416	$ 75,749	$ 50,037	$ 18,449	$ 47,736	$ 137,035	$ 524,422
1431	921	442,195	37.3%	14.4%	9.5%	3.5%	9.1%	26.1%	$ 164,776	$ 63,872	$ 42,191	$ 15,556	$ 40,251	$ 115,549	$ 442,195
1431	923	164,290	37.3%	14.4%	9.5%	3.5%	9.1%	26.1%	$ 61,220	$ 23,731	$ 15,675	$ 5,780	$ 14,955	$ 42,930	$ 164,290
1431	931	5,531,592	37.3%	14.4%	9.5%	3.5%	9.1%	26.1%	$ 2,061,250	$ 799,001	$ 527,786	$ 194,596	$ 503,517	$ 1,445,442	$ 5,531,592
1431	935	-	37.3%	14.4%	9.5%	3.5%	9.1%	26.1%	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1432	920	904,348	33.2%	9.2%	13.9%	3.1%	8.3%	32.2%	$ 300,079	$ 83,207	$ 126,136	$ 28,167	$ 75,124	$ 291,635	$ 904,348
1432	921	41,907	33.2%	9.2%	13.9%	3.1%	8.3%	32.2%	$ 13,905	$ 3,856	$ 5,845	$ 1,305	$ 3,481	$ 13,514	$ 41,907
1432	923	36,000	33.2%	9.2%	13.9%	3.1%	8.3%	32.2%	$ 11,945	$ 3,312	$ 5,021	$ 1,121	$ 2,991	$ 11,609	$ 36,000
1433	920	1,541,673	42.4%	11.8%	11.1%	2.6%	8.9%	23.1%	$ 654,143	$ 181,974	$ 171,032	$ 40,403	$ 137,282	$ 356,838	$ 1,541,673
1433	921	80,308	42.4%	11.8%	11.1%	2.6%	8.9%	23.1%	$ 34,075	$ 9,479	$ 8,909	$ 2,105	$ 7,151	$ 18,588	$ 80,308
1433	923	-	42.4%	11.8%	11.1%	2.6%	8.9%	23.1%	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1441	561	6,457,338	41.2%	10.5%	12.2%	2.5%	8.7%	24.8%	$ 2,660,761	$ 680,771	$ 786,260	$ 164,479	$ 562,213	$ 1,602,854	$ 6,457,338
1441	920	176,527	41.2%	10.5%	12.2%	2.5%	8.7%	24.8%	$ 72,738	$ 18,611	$ 21,494	$ 4,496	$ 15,369	$ 43,818	$ 176,527
1441	921	2,577,506	41.2%	10.5%	12.2%	2.5%	8.7%	24.8%	$ 1,062,067	$ 271,736	$ 313,843	$ 65,653	$ 224,413	$ 639,794	$ 2,577,506
1441	923	85,000	41.2%	10.5%	12.2%	2.5%	8.7%	24.8%	$ 35,024	$ 8,961	$ 10,350	$ 2,165	$ 7,401	$ 21,099	$ 85,000
1441	931	-	41.2%	10.5%	12.2%	2.5%	8.7%	24.8%	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1441	935	1,373,500	41.2%	10.5%	12.2%	2.5%	8.7%	24.8%	$ 565,954	$ 144,803	$ 167,240	$ 34,985	$ 119,585	$ 340,933	$ 1,373,500
1442	920	2,402,034	23.5%	0.2%	21.8%	2.7%	6.9%	45.0%	$ 563,435	$ 4,217	$ 523,190	$ 64,377	$ 164,824	$ 1,081,990	$ 2,402,034
1442	921	160,600	23.5%	0.2%	21.8%	2.7%	6.9%	45.0%	$ 37,671	$ 282	$ 34,980	$ 4,304	$ 11,020	$ 72,342	$ 160,600
1442	923	80,000	23.5%	0.2%	21.8%	2.7%	6.9%	45.0%	$ 18,765	$ 140	$ 17,425	$ 2,144	$ 5,489	$ 36,036	$ 80,000
1451	920	1,124,828	23.5%	0.2%	21.8%	2.7%	6.9%	45.0%	$ 263,846	$ 1,975	$ 245,000	$ 30,147	$ 77,184	$ 506,676	$ 1,124,828
1451	921	176,219	23.5%	0.2%	21.8%	2.7%	6.9%	45.0%	$ 41,335	$ 309	$ 38,382	$ 4,723	$ 12,092	$ 79,377	$ 176,219
1451	923	395,000	23.5%	0.2%	21.8%	2.7%	6.9%	45.0%	$ 92,654	$ 694	$ 86,035	$ 10,586	$ 27,104	$ 177,927	$ 395,000
1461	568	2,385,558	96.4%	2.4%	0.0%	0.0%	0.6%	0.6%	$ 2,300,738	$ 58,314	$ -	$ -	$ 13,253	$ 13,253	$ 2,385,558
1462	902	2,547,393	21.4%	0.0%	0.0%	0.0%	0.0%	78.6%	$ 545,870	$ -	$ -	$ -	$ -	$ 2,001,523	$ 2,547,393
1463	568	347,495	47.5%	1.3%	6.4%	0.9%	5.0%	38.8%	$ 164,980	$ 4,562	$ 22,368	$ 3,207	$ 17,532	$ 134,846	$ 347,495
1466	902	19,175	48.0%	7.3%	1.2%	1.3%	3.5%	38.7%	$ 9,200	$ 1,400	$ 229	$ 256	$ 665	$ 7,424	$ 19,175

California Independent System Operator
Statement BK1: Support for Cost Allocations by ISO Cost Center: Total Costs
For Year Ended December 31, 2004

			Percentages						Dollars						
Center	FERC Shor	Annual Budget	Core Reliability Services (CRS)	Energy & Transmission Services (ETS)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering & Client Relations (SMCR)	Core Reliability Services (CRS)	Energy & Transmission Services (ETS)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering & Client Relations (SMCR)	Total
1466	920	1,406,534	48.0%	7.3%	1.2%	1.3%	3.5%	38.7%	$ 674,877	$ 102,685	$ 16,799	$ 18,797	$ 48,808	$ 544,568	$ 1,406,534
1466	921	63,573	48.0%	7.3%	1.2%	1.3%	3.5%	38.7%	$ 30,503	$ 4,641	$ 759	$ 850	$ 2,206	$ 24,614	$ 63,573
1466	923	120,685	48.0%	7.3%	1.2%	1.3%	3.5%	38.7%	$ 57,907	$ 8,811	$ 1,441	$ 1,613	$ 4,188	$ 46,726	$ 120,685
1467	920	1,086,619	9.1%	0.0%	0.0%	0.0%	0.0%	90.9%	$ 98,784	$ -	$ -	$ -	$ -	$ 987,835	$ 1,086,619
1467	921	83,735	9.1%	0.0%	0.0%	0.0%	0.0%	90.9%	$ 7,612	$ -	$ -	$ -	$ -	$ 76,123	$ 83,735
1468	920	577,687	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 254,549	$ 124,042	$ 20,293	$ 22,706	$ 58,960	$ 97,137	$ 577,687
1468	921	31,999	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 14,100	$ 6,871	$ 1,124	$ 1,258	$ 3,266	$ 5,381	$ 31,999
1469	920	1,225,867	24.5%	18.3%	6.4%	8.7%	24.3%	17.8%	$ 299,874	$ 223,988	$ 78,495	$ 107,202	$ 297,898	$ 218,410	$ 1,225,867
1469	921	72,539	24.5%	18.3%	6.4%	8.7%	24.3%	17.8%	$ 17,745	$ 13,254	$ 4,645	$ 6,344	$ 17,628	$ 12,924	$ 72,539
1471	920	674,348	23.5%	0.2%	21.8%	2.7%	6.9%	45.0%	$ 158,179	$ 1,184	$ 146,881	$ 18,073	$ 46,273	$ 303,759	$ 674,348
1471	921	62,827	23.5%	0.2%	21.8%	2.7%	6.9%	45.0%	$ 14,737	$ 110	$ 13,684	$ 1,684	$ 4,311	$ 28,300	$ 62,827
1471	923	212,940	23.5%	0.2%	21.8%	2.7%	6.9%	45.0%	$ 49,948	$ 374	$ 46,381	$ 5,707	$ 14,612	$ 95,918	$ 212,940
1481	920	1,263,277	45.2%	2.9%	26.7%	2.5%	17.0%	5.7%	$ 571,484	$ 36,122	$ 337,551	$ 31,582	$ 214,831	$ 71,706	$ 1,263,277
1481	921	63,739	45.2%	2.9%	26.7%	2.5%	17.0%	5.7%	$ 28,834	$ 1,823	$ 17,031	$ 1,593	$ 10,839	$ 3,618	$ 63,739
1481	923	189,128	45.2%	2.9%	26.7%	2.5%	17.0%	5.7%	$ 85,558	$ 5,408	$ 50,536	$ 4,728	$ 32,163	$ 10,735	$ 189,128
1482	568	616,978	44.0%	1.0%	20.3%	6.2%	23.4%	5.1%	$ 271,532	$ 6,468	$ 125,046	$ 38,098	$ 144,465	$ 31,368	$ 616,978
1511	560	(154,783)	66.7%	33.3%	0.0%	0.0%	0.0%	0.0%	$ (103,249)	$ (51,534)	$ -	$ -	$ -	$ -	$ (154,783)
1521	560	2,497,543	62.5%	37.5%	0.0%	0.0%	0.0%	0.0%	$ 1,560,965	$ 936,579	$ -	$ -	$ -	$ -	$ 2,497,543
1542	561	1,910,211	95.1%	4.9%	0.0%	0.0%	0.0%	0.0%	$ 1,816,711	$ 93,500	$ -	$ -	$ -	$ -	$ 1,910,211
1543	561	1,185,612	48.9%	51.1%	0.0%	0.0%	0.0%	0.0%	$ 580,350	$ 605,262	$ -	$ -	$ -	$ -	$ 1,185,612
1544	561	2,625,459	60.0%	40.0%	0.0%	0.0%	0.0%	0.0%	$ 1,575,276	$ 1,050,184	$ -	$ -	$ -	$ -	$ 2,625,459
1544	568	160,983	60.0%	40.0%	0.0%	0.0%	0.0%	0.0%	$ 96,590	$ 64,393	$ -	$ -	$ -	$ -	$ 160,983
1545	561	7,545,786	67.5%	32.5%	0.0%	0.0%	0.0%	0.0%	$ 5,090,879	$ 2,454,908	$ -	$ -	$ -	$ -	$ 7,545,786
1546	561	1,368,574	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	$ 1,368,574	$ -	$ -	$ -	$ -	$ -	$ 1,368,574
1547	561	576,104	46.4%	53.6%	0.0%	0.0%	0.0%	0.0%	$ 267,403	$ 308,701	$ -	$ -	$ -	$ -	$ 576,104
1548	561	293,953	93.2%	6.8%	0.0%	0.0%	0.0%	0.0%	$ 273,953	$ 20,000	$ -	$ -	$ -	$ -	$ 293,953
1549	561	2,882,700	50.5%	49.5%	0.0%	0.0%	0.0%	0.0%	$ 1,455,116	$ 1,427,583	$ -	$ -	$ -	$ -	$ 2,882,700
1554	561	853,958	42.9%	57.1%	0.0%	0.0%	0.0%	0.0%	$ 366,029	$ 487,929	$ -	$ -	$ -	$ -	$ 853,958
1555	561	1,111,667	55.6%	44.4%	0.0%	0.0%	0.0%	0.0%	$ 617,593	$ 494,074	$ -	$ -	$ -	$ -	$ 1,111,667
1558	561	1,623,755	58.5%	41.5%	0.0%	0.0%	0.0%	0.0%	$ 949,170	$ 674,585	$ -	$ -	$ -	$ -	$ 1,623,755
1559	561	584,623	60.0%	40.0%	0.0%	0.0%	0.0%	0.0%	$ 350,774	$ 233,849	$ -	$ -	$ -	$ -	$ 584,623
1561	561	1,241,824	65.3%	34.7%	0.0%	0.0%	0.0%	0.0%	$ 811,216	$ 430,608	$ -	$ -	$ -	$ -	$ 1,241,824
1562	561	1,355,194	55.1%	44.9%	0.0%	0.0%	0.0%	0.0%	$ 747,330	$ 607,864	$ -	$ -	$ -	$ -	$ 1,355,194
1563	561	704,967	74.6%	25.4%	0.0%	0.0%	0.0%	0.0%	$ 525,574	$ 179,393	$ -	$ -	$ -	$ -	$ 704,967
1564	561	272,798	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	$ 272,798	$ -	$ -	$ -	$ -	$ -	$ 272,798
1564	568	22,231	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	$ 22,231	$ -	$ -	$ -	$ -	$ -	$ 22,231
1565	561	1,722,771	76.9%	23.1%	0.0%	0.0%	0.0%	0.0%	$ 1,325,209	$ 397,563	$ -	$ -	$ -	$ -	$ 1,722,771
1565	568	111,754	76.9%	23.1%	0.0%	0.0%	0.0%	0.0%	$ 85,965	$ 25,789	$ -	$ -	$ -	$ -	$ 111,754
1566	561	506,534	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	$ 506,534	$ -	$ -	$ -	$ -	$ -	$ 506,534
1566	568	40,883	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	$ 40,883	$ -	$ -	$ -	$ -	$ -	$ 40,883
1611	920	301,939	35.8%	21.8%	3.7%	7.2%	17.0%	14.5%	$ 108,080	$ 65,768	$ 11,251	$ 21,689	$ 51,249	$ 43,901	$ 301,939
1611	921	(36,622)	35.8%	21.8%	3.7%	7.2%	17.0%	14.5%	$ (13,109)	$ (7,977)	$ (1,365)	$ (2,631)	$ (6,216)	$ (5,325)	$ (36,622)
1611	923	20,000	35.8%	21.8%	3.7%	7.2%	17.0%	14.5%	$ 7,159	$ 4,356	$ 745	$ 1,437	$ 3,395	$ 2,908	$ 20,000
1631	920	3,454,104	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 1,520,266	$ 743,149	$ 130,449	$ 159,306	$ 360,971	$ 539,963	$ 3,454,104
1631	921	194,392	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 85,558	$ 41,823	$ 7,341	$ 8,966	$ 20,315	$ 30,388	$ 194,392
1631	923	8,568,140	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 3,771,123	$ 1,843,432	$ 323,588	$ 395,169	$ 895,412	$ 1,339,416	$ 8,568,140
1641	920	2,050,085	15.3%	26.3%	0.0%	19.9%	31.4%	7.1%	$ 314,074	$ 539,783	$ -	$ 407,874	$ 643,397	$ 144,957	$ 2,050,085
1641	921	124,078	15.3%	26.3%	0.0%	19.9%	31.4%	7.1%	$ 19,009	$ 32,669	$ -	$ 24,686	$ 38,941	$ 8,773	$ 124,078
1641	923	774,800	15.3%	26.3%	0.0%	19.9%	31.4%	7.1%	$ 118,700	$ 204,003	$ -	$ 154,150	$ 243,162	$ 54,785	$ 774,800
1642	921	3,000	25.0%	25.0%	0.0%	25.0%	25.0%	0.0%	$ 750	$ 750	$ -	$ 750	$ 750	$ -	$ 3,000
1642	923	558,750	25.0%	25.0%	0.0%	25.0%	25.0%	0.0%	$ 139,688	$ 139,688	$ -	$ 139,688	$ 139,688	$ -	$ 558,750
1651	921	4,400	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 1,937	$ 947	$ 166	$ 203	$ 460	$ 688	$ 4,400
1651	930	52,000	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 22,887	$ 11,188	$ 1,964	$ 2,398	$ 5,434	$ 8,129	$ 52,000
1651	930	175,000	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 77,023	$ 37,651	$ 6,609	$ 8,071	$ 18,288	$ 27,357	$ 175,000
1661	920	1,268,093	21.9%	20.4%	11.9%	0.0%	28.5%	17.3%	$ 277,701	$ 258,259	$ 150,891	$ -	$ 361,426	$ 219,816	$ 1,268,093
1661	921	52,000	21.9%	20.4%	11.9%	0.0%	28.5%	17.3%	$ 11,388	$ 10,590	$ 6,188	$ -	$ 14,821	$ 9,014	$ 52,000
1661	923	402,000	21.9%	20.4%	11.9%	0.0%	28.5%	17.3%	$ 88,034	$ 81,871	$ 47,834	$ -	$ 114,576	$ 69,684	$ 402,000
1662	902	434,112	8.3%	0.0%	0.0%	0.0%	50.0%	41.7%	$ 36,176	$ -	$ -	$ -	$ 217,056	$ 180,880	$ 434,112
1711	901	(145,901)	17.1%	2.4%	9.5%	9.4%	20.3%	41.2%	$ (25,009)	$ (3,542)	$ (13,800)	$ (13,704)	$ (29,688)	$ (60,157)	$ (145,901)
1711	903	76,113	17.1%	2.4%	9.5%	9.4%	20.3%	41.2%	$ 13,047	$ 1,848	$ 7,199	$ 7,149	$ 15,488	$ 31,382	$ 76,113
1721	903	450,755	25.0%	0.0%	0.0%	0.0%	0.0%	75.0%	$ 112,689	$ -	$ -	$ -	$ -	$ 338,066	$ 450,755
1722	903	89,360	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	$ -	$ -	$ -	$ -	$ -	$ 89,360	$ 89,360
1722	905	611,291	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	$ -	$ -	$ -	$ -	$ -	$ 611,291	$ 611,291
1723	903	992,025	80.3%	19.7%	0.0%	0.0%	0.0%	0.0%	$ 796,597	$ 195,428	$ -	$ -	$ -	$ -	$ 992,025
1724	903	1,280,172	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	$ -	$ -	$ -	$ -	$ -	$ 1,280,172	$ 1,280,172
1725	903	1,283,046	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	$ -	$ -	$ -	$ -	$ -	$ 1,283,046	$ 1,283,046
1731	903	1,525,676	43.2%	6.8%	0.0%	0.0%	0.0%	50.0%	$ 658,584	$ 104,254	$ -	$ -	$ -	$ 762,838	$ 1,525,676

California Independent System Operator
Statement BK1: Support for Cost Allocations by ISO Cost Center: Total Costs
For Year Ended December 31, 2004

			Percentages						Dollars						
Center	FERC Shor	Annual Budget	Core Reliability Services (CRS)	Energy & Transmission Services (ETS)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering & Client Relations (SMCR)	Core Reliability Services (CRS)	Energy & Transmission Services (ETS)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering & Client Relations (SMCR)	Total
1741	908	2,366,671	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	$ -	$ -	$ -	$ -	$ -	$ 2,366,671	$ 2,366,671
1751	568	979,523	30.7%	0.0%	15.3%	15.3%	34.8%	3.8%	$ 300,321	$ -	$ 150,160	$ 150,160	$ 341,341	$ 37,540	$ 979,523
1752	568	2,773,203	27.3%	5.5%	27.3%	21.8%	18.1%	0.0%	$ 757,251	$ 151,450	$ 757,251	$ 605,801	$ 501,450	$ -	$ 2,773,203
1753	568	1,955,609	21.3%	0.0%	0.0%	28.4%	43.1%	7.1%	$ 416,926	$ -	$ -	$ 555,901	$ 843,807	$ 138,975	$ 1,955,609
1755	568	1,175,260	5.9%	0.0%	47.3%	11.8%	29.1%	5.9%	$ 69,443	$ -	$ 555,545	$ 138,886	$ 341,942	$ 69,443	$ 1,175,260
1756	568	2,102,495	0.0%	0.0%	0.0%	0.0%	70.9%	29.1%	$ -	$ -	$ -	$ -	$ 1,491,272	$ 611,223	$ 2,102,495
1757	568	998,732	7.4%	0.0%	29.5%	29.5%	26.2%	7.4%	$ 73,706	$ -	$ 294,825	$ 294,825	$ 261,669	$ 73,706	$ 998,732
1811	920	322,823	44.0%	21.5%	3.6%	4.2%	10.3%	16.3%	$ 142,180	$ 69,374	$ 11,690	$ 13,594	$ 33,272	$ 52,712	$ 322,823
1811	921	(10,247)	44.0%	21.5%	3.6%	4.2%	10.3%	16.3%	$ (4,513)	$ (2,202)	$ (371)	$ (431)	$ (1,056)	$ (1,673)	$ (10,247)
1811	923	155,000	44.0%	21.5%	3.6%	4.2%	10.3%	16.3%	$ 68,266	$ 33,309	$ 5,613	$ 6,527	$ 15,975	$ 25,309	$ 155,000
1821	920	496,232	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 218,408	$ 106,764	$ 18,741	$ 22,887	$ 51,859	$ 77,573	$ 496,232
1821	921	178,444	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 78,539	$ 38,392	$ 6,739	$ 8,230	$ 18,648	$ 27,895	$ 178,444
1821	923	172,500	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 75,923	$ 37,113	$ 6,515	$ 7,956	$ 18,027	$ 26,966	$ 172,500
1831	920	558,240	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 245,700	$ 120,105	$ 21,083	$ 25,746	$ 58,339	$ 87,267	$ 558,240
1831	921	20,000	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 8,803	$ 4,303	$ 755	$ 922	$ 2,090	$ 3,127	$ 20,000
1831	923	155,500	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 68,441	$ 33,456	$ 5,873	$ 7,172	$ 16,251	$ 24,309	$ 155,500
1831	930	3,600	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 1,584	$ 775	$ 136	$ 166	$ 376	$ 563	$ 3,600
1841	920	2,703,824	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 1,191,400	$ 580,571	$ 94,978	$ 106,275	$ 275,958	$ 454,642	$ 2,703,824
1841	921	656,125	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 289,112	$ 140,885	$ 23,048	$ 25,789	$ 66,966	$ 110,326	$ 656,125
1841	923	1,215,000	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 535,372	$ 260,887	$ 42,680	$ 47,756	$ 124,006	$ 204,300	$ 1,215,000
1841	930	50,000	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 22,032	$ 10,736	$ 1,756	$ 1,965	$ 5,103	$ 8,407	$ 50,000
1851	920	627,028	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 275,976	$ 134,905	$ 23,681	$ 28,919	$ 65,527	$ 98,020	$ 627,028
1851	921	13,800	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 6,074	$ 2,969	$ 521	$ 636	$ 1,442	$ 2,157	$ 13,800
1851	923	56,000	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 24,647	$ 12,048	$ 2,115	$ 2,583	$ 5,852	$ 8,754	$ 56,000
1861	920	633,504	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 278,826	$ 136,298	$ 23,925	$ 29,218	$ 66,204	$ 99,033	$ 633,504
1861	921	48,300	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 21,258	$ 10,392	$ 1,824	$ 2,228	$ 5,048	$ 7,551	$ 48,300
1861	923	270,000	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 118,836	$ 58,090	$ 10,197	$ 12,453	$ 28,216	$ 42,208	$ 270,000
		151,735,058	41.5%	16.2%	6.7%	4.1%	9.8%	21.8%	62,995,426	24,505,839	10,115,593	6,208,095	14,888,585	33,021,519	151,735,058

Notes:
Costs for ETS are further allocated to the two ETS subcategories in an 80% / 20% ratio.
SMCR costs are later reallocated in part to other service categories.

The O&M budget cost allocations results can also be further displayed in accordance with the FERC Uniform System of Accounts:

408	40.8%	16.2%	6.7%	4.3%	10.2%	22.0%	261,248	103,585	42,653	27,344	65,381	140,789	641,000
560	62.2%	37.8%	0.0%	0.0%	0.0%	0.0%	1,457,715	885,045	-	-	-	-	2,342,761
561	60.0%	28.1%	2.7%	0.8%	2.6%	5.9%	21,650,600	10,146,775	964,378	304,638	926,772	2,115,455	36,108,618
568	33.7%	2.3%	13.9%	13.1%	28.9%	8.1%	4,600,566	310,976	1,905,196	1,786,879	3,956,731	1,110,355	13,670,704
901	17.1%	2.4%	9.5%	9.4%	20.3%	41.2%	(25,009)	(3,542)	(13,800)	(13,704)	(29,688)	(60,157)	(145,901)
902	19.7%	0.0%	0.0%	0.0%	7.3%	73.0%	591,246	1,400	229	256	217,722	2,189,827	3,000,680
903	27.7%	5.3%	0.1%	0.1%	0.3%	66.4%	1,580,916	301,530	7,199	7,149	15,488	3,784,864	5,697,146
905	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	-	-	-	-	-	611,291	611,291
908	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	-	-	-	-	-	2,366,671	2,366,671
920	35.6%	15.0%	8.1%	4.7%	12.1%	24.4%	10,904,201	4,592,417	2,492,398	1,435,032	3,702,614	7,465,856	30,592,519
921	39.2%	13.8%	9.4%	3.6%	9.9%	24.0%	2,354,699	830,921	566,315	216,578	596,008	1,442,143	6,006,664
923	40.3%	20.1%	5.0%	5.7%	12.2%	16.7%	6,627,296	3,300,746	818,643	937,244	2,004,380	2,748,256	16,436,565
924	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	985,960	481,965	84,602	103,317	234,105	350,190	2,240,139
925	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	4,401	2,151	378	461	1,045	1,563	10,000
930	44.0%	21.5%	3.8%	4.5%	10.4%	15.7%	229,158	111,985	19,529	23,670	54,283	81,974	520,600
931	38.0%	13.6%	9.0%	4.0%	9.7%	25.6%	4,517,655	1,614,883	1,074,291	478,622	1,150,710	3,043,083	11,879,244
935	36.7%	9.2%	10.9%	4.6%	10.1%	28.5%	7,254,772	1,824,999	2,153,583	900,611	1,993,034	5,629,359	19,756,358
	41.5%	16.2%	6.7%	4.1%	9.8%	21.8%	62,995,426	24,505,839	10,115,593	6,208,095	14,888,585	33,021,519	151,735,058

California Independent System Operator
Statement BK2: Support for Cost Allocations by ISO Cost Center: Salary Costs
For Year Ended December 31, 2004

Center	FERC_Short	Salaries	Core Reliability Services (CRS)	Energy & Transmission Services (ETS)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering & Client Relations (SMCR)	Dollars: Core Reliability Services (CRS)	Dollars: Energy & Transmission Services (ETS)	Dollars: Forward Scheduling (FS)	Dollars: Congestion Management (CONG)	Dollars: Market Usage (MU)	Dollars: Settlements, Metering & Client Relations (SMCR)	Total Dollars
1111	920	659,078	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	290,082	141,800	24,891	30,397	68,877	103,030	659,078
1241	561	1,216,788	7.0%	0.0%	13.9%	10.9%	28.4%	39.9%	84,622	-	168,691	132,741	345,264	485,471	1,216,788
1311	920	356,323	44.0%	21.5%	3.6%	4.2%	10.3%	16.3%	156,933	76,575	12,913	15,028	36,734	58,140	356,323
1321	920	921,198	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	405,450	198,195	34,790	42,486	96,270	144,006	921,198
1331	920	780,134	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	343,363	167,845	29,463	35,980	81,528	121,955	780,134
1351	920	710,066	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	312,880	152,467	24,943	27,909	72,471	119,396	710,066
1361	920	731,998	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	322,544	157,176	25,713	28,771	74,709	123,084	731,998
1411	920	(85,121)	37.5%	7.4%	11.4%	3.4%	8.8%	31.5%	(31,904)	(6,321)	(9,734)	(2,890)	(7,490)	(26,782)	(85,121)
1422	920	246,402	38.6%	13.8%	3.5%	4.5%	12.3%	27.2%	95,166	34,017	8,670	11,138	30,370	67,040	246,402
1424	920	936,407	34.6%	6.3%	12.5%	4.9%	10.2%	31.5%	324,389	59,350	116,698	45,750	95,400	294,820	936,407
1431	920	524,422	37.3%	14.4%	9.5%	3.5%	9.1%	26.1%	195,416	75,749	50,037	18,449	47,736	137,035	524,422
1432	920	904,348	33.2%	9.2%	13.9%	3.1%	8.3%	32.2%	300,079	83,207	126,136	28,167	75,124	291,635	904,348
1433	920	1,541,673	42.4%	11.8%	11.1%	2.6%	8.9%	23.1%	654,143	181,974	171,032	40,403	137,282	356,838	1,541,673
1441	920	176,527	41.2%	10.5%	12.2%	2.5%	8.7%	24.8%	72,738	18,611	21,494	4,496	15,369	43,818	176,527
1442	920	2,402,034	23.5%	0.2%	21.8%	2.7%	6.9%	45.0%	563,435	4,217	523,190	64,377	164,824	1,081,990	2,402,034
1451	920	1,124,828	23.5%	0.2%	21.8%	2.7%	6.9%	45.0%	263,846	1,975	245,000	30,147	77,184	506,676	1,124,828
1461	568	2,168,381	96.4%	2.4%	0.0%	0.0%	0.6%	0.6%	2,091,283	53,005	-	-	12,047	12,047	2,168,381
1462	902	2,000,514	21.4%	0.0%	0.0%	0.0%	0.0%	78.6%	428,681	-	-	-	-	1,571,832	2,000,514
1463	568	316,193	47.5%	1.3%	6.4%	0.9%	5.0%	38.8%	150,119	4,151	20,353	2,918	15,953	122,699	316,193
1466	920	1,406,534	48.0%	7.3%	1.2%	1.3%	3.5%	38.7%	674,877	102,685	16,799	18,797	48,808	544,568	1,406,534
1467	920	1,086,619	9.1%	0.0%	0.0%	0.0%	0.0%	90.9%	98,784	-	-	-	-	987,835	1,086,619
1468	920	577,687	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	254,549	124,042	20,293	22,706	58,960	97,137	577,687
1469	920	1,225,867	24.5%	18.3%	6.4%	8.7%	24.3%	17.8%	299,874	223,988	78,495	107,202	297,898	218,410	1,225,867
1471	920	674,348	23.5%	0.2%	21.8%	2.7%	6.9%	45.0%	158,179	1,184	146,881	18,073	46,273	303,759	674,348
1481	920	1,263,277	45.2%	2.9%	26.7%	2.5%	17.0%	5.7%	571,484	36,122	337,551	31,582	214,831	71,706	1,263,277
1482	568	585,478	44.0%	1.0%	20.3%	6.2%	23.4%	5.1%	257,669	6,138	118,662	36,153	137,090	29,767	585,478
1511	560	(289,459)	66.7%	33.3%	0.0%	0.0%	0.0%	0.0%	(193,086)	(96,373)	-	-	-	-	(289,459)
1521	560	2,382,163	62.5%	37.5%	0.0%	0.0%	0.0%	0.0%	1,488,852	893,311	-	-	-	-	2,382,163
1542	561	1,709,637	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1,709,637	-	-	-	-	-	1,709,637
1543	561	963,112	57.1%	42.9%	0.0%	0.0%	0.0%	0.0%	550,350	412,762	-	-	-	-	963,112
1544	561	2,568,259	60.0%	40.0%	0.0%	0.0%	0.0%	0.0%	1,540,956	1,027,304	-	-	-	-	2,568,259
1544	568	160,983	60.0%	40.0%	0.0%	0.0%	0.0%	0.0%	96,590	64,393	-	-	-	-	160,983
1545	561	7,225,286	68.0%	32.0%	0.0%	0.0%	0.0%	0.0%	4,913,195	2,312,092	-	-	-	-	7,225,286
1546	561	1,320,574	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1,320,574	-	-	-	-	-	1,320,574
1547	561	322,104	66.7%	33.3%	0.0%	0.0%	0.0%	0.0%	214,736	107,368	-	-	-	-	322,104
1548	561	251,453	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	251,453	-	-	-	-	-	251,453
1549	561	2,114,224	61.1%	38.9%	0.0%	0.0%	0.0%	0.0%	1,292,026	822,198	-	-	-	-	2,114,224
1554	561	657,008	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	328,504	328,504	-	-	-	-	657,008
1555	561	1,063,107	55.6%	44.4%	0.0%	0.0%	0.0%	0.0%	590,615	472,492	-	-	-	-	1,063,107
1558	561	1,322,205	66.7%	33.3%	0.0%	0.0%	0.0%	0.0%	881,470	440,735	-	-	-	-	1,322,205
1559	561	573,103	60.0%	40.0%	0.0%	0.0%	0.0%	0.0%	343,862	229,241	-	-	-	-	573,103
1561	561	1,118,224	66.7%	33.3%	0.0%	0.0%	0.0%	0.0%	745,483	372,741	-	-	-	-	1,118,224
1562	561	1,307,334	55.6%	44.4%	0.0%	0.0%	0.0%	0.0%	726,297	581,037	-	-	-	-	1,307,334
1563	561	627,767	80.0%	20.0%	0.0%	0.0%	0.0%	0.0%	502,214	125,553	-	-	-	-	627,767
1564	561	231,298	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	231,298	-	-	-	-	-	231,298
1564	568	22,231	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	22,231	-	-	-	-	-	22,231
1565	561	1,686,171	76.9%	23.1%	0.0%	0.0%	0.0%	0.0%	1,297,055	389,116	-	-	-	-	1,686,171
1565	568	111,754	76.9%	23.1%	0.0%	0.0%	0.0%	0.0%	85,965	25,789	-	-	-	-	111,754
1566	561	414,634	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	414,634	-	-	-	-	-	414,634

California Independent System Operator
Statement BK2: Support for Cost Allocations by ISO Cost Center: Salary Costs
For Year Ended December 31, 2004

Center	FERC_Short	Salaries	Core Reliability Services (CRS)	Energy & Transmission Services (ETS)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering & Client Relations (SMCR)	Dollars: Core Reliability Services (CRS)	Dollars: Energy & Transmission Services (ETS)	Dollars: Forward Scheduling (FS)	Dollars: Congestion Management (CONG)	Dollars: Market Usage (MU)	Dollars: Settlements, Metering & Client Relations (SMCR)	Total Dollars
1566	568	40,883	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	40,883	-	-	-	-	-	40,883
1611	920	301,939	35.8%	21.8%	3.7%	7.2%	17.0%	14.5%	108,080	65,768	11,251	21,689	51,249	43,901	301,939
1631	920	3,454,104	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	1,520,266	743,149	130,449	159,306	360,971	539,963	3,454,104
1641	920	2,050,085	20.3%	21.9%	0.0%	15.6%	32.8%	9.4%	416,424	448,456	-	320,326	672,684	192,195	2,050,085
1661	920	1,268,093	24.0%	22.0%	14.0%	0.0%	25.0%	15.0%	304,342	278,980	177,533	-	317,023	190,214	1,268,093
1662	902	405,112	8.3%	0.0%	0.0%	0.0%	50.0%	41.7%	33,759	-	-	-	202,556	168,797	405,112
1711	901	(57,167)	17.1%	2.4%	9.5%	9.4%	20.3%	41.2%	(9,799)	(1,388)	(5,407)	(5,370)	(11,632)	(23,571)	(57,167)
1711	903	76,113	17.1%	2.4%	9.5%	9.4%	20.3%	41.2%	13,047	1,848	7,199	7,149	15,488	31,382	76,113
1721	903	426,755	25.0%	0.0%	0.0%	0.0%	0.0%	75.0%	106,689	-	-	-	-	320,066	426,755
1722	905	604,441	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	-	-	-	-	-	604,441	604,441
1723	903	762,347	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	762,347	-	-	-	-	-	762,347
1724	903	1,074,144	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	-	-	-	-	-	1,074,144	1,074,144
1725	903	994,282	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	-	-	-	-	-	994,282	994,282
1731	903	1,250,164	50.0%	0.0%	0.0%	0.0%	0.0%	50.0%	625,082	-	-	-	-	625,082	1,250,164
1741	908	2,076,971	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	-	-	-	-	-	2,076,971	2,076,971
1751	568	373,302	40.0%	0.0%	20.0%	20.0%	15.0%	5.0%	149,321	-	74,660	74,660	55,995	18,665	373,302
1752	568	2,323,353	31.3%	6.3%	31.3%	25.0%	6.3%	0.0%	726,048	145,210	726,048	580,838	145,210	-	2,323,353
1753	568	1,362,453	30.0%	0.0%	0.0%	40.0%	20.0%	10.0%	408,736	-	-	544,981	272,491	136,245	1,362,453
1755	568	959,204	7.1%	0.0%	57.1%	14.3%	14.3%	7.1%	68,515	-	548,117	137,029	137,029	68,515	959,204
1756	568	2,030,338	0.0%	0.0%	0.0%	0.0%	72.2%	27.8%	-	-	-	-	1,466,355	563,983	2,030,338
1757	568	871,516	8.3%	0.0%	33.3%	33.3%	16.7%	8.3%	72,626	-	290,505	290,505	145,253	72,626	871,516
1811	920	322,823	44.0%	21.5%	3.6%	4.2%	10.3%	16.3%	142,180	69,374	11,690	13,594	33,272	52,712	322,823
1821	920	496,232	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	218,408	106,764	18,741	22,887	51,859	77,573	496,232
1831	920	558,240	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	245,700	120,105	21,083	25,746	58,339	87,267	558,240
1841	920	1,833,824	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	808,048	393,763	64,417	72,079	187,164	308,354	1,833,824
1851	920	627,028	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	275,976	134,905	23,681	28,919	65,527	98,020	627,028
1861	920	633,504	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	278,826	136,298	23,925	29,218	66,204	99,033	633,504
		79,435,257	45.3%	16.4%	5.6%	3.9%	8.2%	20.5%	36,009,093	13,049,651	4,436,854	3,114,340	6,536,547	16,288,771	79,435,257

Note:
Derivation of the allocation factors for the ISO's costs are documented on the ISO's Cost Allocation Matrix.
This worksheet documents the mapping, or translation of the cost percentages to the FERC accounts used in this Section 35.13 filing.
This is an extract of labor/salary related costs only.
Costs for ETS are further allocated to the two ETS subcategories in an 80% / 20% ratio.
SMCR costs are later reallocated in part to other service categories.

California Independent System Operator
Statement BK3: Support for Cost Allocations by ISO Cost Center
For Year Ended December 31, 2004
Overall Departmental Costs

Cost Center	Cost Center Name	Core Reliability Services (CRS)	Energy & Transmission Services (ETS)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering & Client Relations (SMCR)	Total	Core Reliability Services (CRS)	Energy & Transmission Services (ETS)	Forward Scheduling (FS)	Congestion Management (CONG)	Market Usage (MU)	Settlements, Metering & Client Relations (SMCR)
1111	CEO - General	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 897,241	$ 394,905	$ 193,041	$ 33,886	$ 41,381	$ 93,766	$ 140,261
1241	MD02	7.0%	0.0%	13.9%	10.9%	28.4%	39.9%	$ 1,284,788	$ 89,351	$ -	$ 178,118	$ 140,159	$ 364,559	$ 512,601
1311	CFO - General	44.0%	21.5%	3.6%	4.2%	10.3%	16.3%	$ 332,272	$ 146,340	$ 71,406	$ 12,041	$ 14,014	$ 34,254	$ 54,216
1321	Accounting	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 2,931,098	$ 1,290,074	$ 630,625	$ 110,697	$ 135,185	$ 306,314	$ 458,205
1331	Financial Planning and Treasury	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 3,471,773	$ 1,528,042	$ 746,950	$ 131,116	$ 160,121	$ 362,817	$ 542,726
1351	Facilities	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 6,136,300	$ 2,703,870	$ 1,317,599	$ 215,552	$ 241,189	$ 626,284	$ 1,031,805
1361	Office Administration	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 2,660,758	$ 1,172,424	$ 571,324	$ 93,465	$ 104,582	$ 271,563	$ 447,401
1411	Chief Information Officer- General	37.5%	7.4%	11.4%	3.4%	8.8%	31.5%	$ (319,362)	$ (119,699)	$ (23,714)	$ (36,521)	$ (10,842)	$ (28,103)	$ (100,484)
1422	Corporate & Enterprise Applications - General	38.6%	13.8%	3.5%	4.5%	12.3%	27.2%	$ 272,402	$ 105,208	$ 37,607	$ 9,585	$ 12,313	$ 33,575	$ 74,114
1424	Asset Management	34.6%	6.3%	12.5%	4.9%	10.2%	31.5%	$ 20,455,331	$ 7,086,102	$ 1,296,474	$ 2,549,214	$ 999,390	$ 2,083,966	$ 6,440,185
1431	End User Support	37.3%	14.4%	9.5%	3.5%	9.1%	26.1%	$ 6,662,499	$ 2,482,662	$ 962,353	$ 635,689	$ 234,380	$ 606,459	$ 1,740,955
1432	Computer Operations - General	33.2%	9.2%	13.9%	3.1%	8.3%	32.2%	$ 982,255	$ 325,930	$ 90,375	$ 137,002	$ 30,594	$ 81,596	$ 316,759
1433	Network Operations	42.4%	11.8%	11.1%	2.6%	8.9%	23.1%	$ 1,621,981	$ 688,219	$ 191,454	$ 179,942	$ 42,507	$ 144,434	$ 375,426
1441	Outsourced Contracts	41.2%	10.5%	12.2%	2.5%	8.7%	24.8%	$ 10,669,871	$ 4,396,546	$ 1,124,882	$ 1,299,187	$ 271,779	$ 928,981	$ 2,648,497
1442	Production Support	23.5%	0.2%	21.8%	2.7%	6.9%	45.0%	$ 2,642,634	$ 619,872	$ 4,640	$ 575,596	$ 70,826	$ 181,333	$ 1,190,368
1451	Information Security	23.5%	0.2%	21.8%	2.7%	6.9%	45.0%	$ 1,696,047	$ 397,835	$ 2,978	$ 369,418	$ 45,456	$ 116,380	$ 763,980
1461	Control Systems	96.4%	2.4%	0.0%	0.0%	0.6%	0.6%	$ 2,385,558	$ 2,300,738	$ 58,314	$ -	$ -	$ 13,253	$ 13,253
1462	Field Data Acquisition System (FDAS)	21.4%	0.0%	0.0%	0.0%	0.0%	78.6%	$ 2,547,393	$ 545,870	$ -	$ -	$ -	$ -	$ 2,001,523
1463	Operations Applications - General	47.5%	1.3%	6.4%	0.9%	5.0%	38.8%	$ 347,495	$ 164,980	$ 4,562	$ 22,368	$ 3,207	$ 17,532	$ 134,846
1466	Enterprise Applications	48.0%	7.3%	1.2%	1.3%	3.5%	38.7%	$ 1,609,967	$ 772,488	$ 117,536	$ 19,228	$ 21,515	$ 55,868	$ 623,331
1467	Settlement Systems Services	9.1%	0.0%	0.0%	0.0%	0.0%	90.9%	$ 1,170,354	$ 106,396	$ -	$ -	$ -	$ -	$ 1,063,958
1468	Corporate Application Support	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 609,686	$ 268,649	$ 130,913	$ 21,417	$ 23,964	$ 62,226	$ 102,517
1469	Analytical and Reporting	24.5%	18.3%	6.4%	8.7%	24.3%	17.8%	$ 1,298,406	$ 317,618	$ 237,242	$ 83,140	$ 113,545	$ 315,526	$ 231,334
1471	IT Planning	23.5%	0.2%	21.8%	2.7%	6.9%	45.0%	$ 950,115	$ 222,865	$ 1,668	$ 206,946	$ 25,464	$ 65,195	$ 427,977
1481	Markets and Scheduling	45.2%	2.9%	26.7%	2.5%	17.0%	5.7%	$ 1,516,144	$ 685,877	$ 43,352	$ 405,118	$ 37,904	$ 257,834	$ 86,059
1482	Market Support Services	44.0%	1.0%	20.3%	6.2%	23.4%	5.1%	$ 616,978	$ 271,532	$ 6,468	$ 125,046	$ 38,098	$ 144,465	$ 31,368
1511	VP Grid Operations - General	66.7%	33.3%	0.0%	0.0%	0.0%	0.0%	$ (154,783)	$ (103,249)	$ (51,534)	$ -	$ -	$ -	$ -
1521	Grid Planning	62.5%	37.5%	0.0%	0.0%	0.0%	0.0%	$ 2,497,543	$ 1,560,965	$ 936,579	$ -	$ -	$ -	$ -
1542	Outage Coordination	95.1%	4.9%	0.0%	0.0%	0.0%	0.0%	$ 1,910,211	$ 1,816,711	$ 93,500	$ -	$ -	$ -	$ -
1543	Loads and Resources	48.9%	51.1%	0.0%	0.0%	0.0%	0.0%	$ 1,185,612	$ 580,350	$ 605,262	$ -	$ -	$ -	$ -
1544	Real-Time Scheduling	60.0%	40.0%	0.0%	0.0%	0.0%	0.0%	$ 2,786,442	$ 1,671,865	$ 1,114,577	$ -	$ -	$ -	$ -
1545	Grid Operations - General	67.5%	32.5%	0.0%	0.0%	0.0%	0.0%	$ 7,545,786	$ 5,090,879	$ 2,454,908	$ -	$ -	$ -	$ -
1546	Security Coordination	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	$ 1,368,574	$ 1,368,574	$ -	$ -	$ -	$ -	$ -
1547	Engineering and Maintenance - General	46.4%	53.6%	0.0%	0.0%	0.0%	0.0%	$ 576,104	$ 267,403	$ 308,701	$ -	$ -	$ -	$ -
1548	OSAT Group - General	93.2%	6.8%	0.0%	0.0%	0.0%	0.0%	$ 293,953	$ 273,953	$ 20,000	$ -	$ -	$ -	$ -
1549	Operations Training	50.5%	49.5%	0.0%	0.0%	0.0%	0.0%	$ 2,882,700	$ 1,455,116	$ 1,427,583	$ -	$ -	$ -	$ -
1554	Special Projects Engineering	42.9%	57.1%	0.0%	0.0%	0.0%	0.0%	$ 853,958	$ 366,029	$ 487,929	$ -	$ -	$ -	$ -
1555	Operations Support Group	55.6%	44.4%	0.0%	0.0%	0.0%	0.0%	$ 1,111,667	$ 617,593	$ 494,074	$ -	$ -	$ -	$ -
1558	Transmission Maintenance	58.5%	41.5%	0.0%	0.0%	0.0%	0.0%	$ 1,623,755	$ 949,170	$ 674,585	$ -	$ -	$ -	$ -
1559	Operations Application Support	60.0%	40.0%	0.0%	0.0%	0.0%	0.0%	$ 584,623	$ 350,774	$ 233,849	$ -	$ -	$ -	$ -
1561	Operations Engineering South	65.3%	34.7%	0.0%	0.0%	0.0%	0.0%	$ 1,241,824	$ 811,216	$ 430,608	$ -	$ -	$ -	$ -
1562	Operations Engineering North	55.1%	44.9%	0.0%	0.0%	0.0%	0.0%	$ 1,355,194	$ 747,330	$ 607,864	$ -	$ -	$ -	$ -
1563	Coordinated Operations	74.6%	25.4%	0.0%	0.0%	0.0%	0.0%	$ 704,967	$ 525,574	$ 179,393	$ -	$ -	$ -	$ -
1564	Operations Scheduling - General	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	$ 295,029	$ 295,029	$ -	$ -	$ -	$ -	$ -
1565	Pre-Scheduling and Support	76.9%	23.1%	0.0%	0.0%	0.0%	0.0%	$ 1,834,525	$ 1,411,173	$ 423,352	$ -	$ -	$ -	$ -
1566	Regional Coordination - General	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	$ 547,417	$ 547,417	$ -	$ -	$ -	$ -	$ -
1611	VP General Counsel - General	35.8%	21.8%	3.7%	7.2%	17.0%	14.5%	$ 285,317	$ 102,130	$ 62,148	$ 10,632	$ 20,495	$ 48,427	$ 41,484
1631	Legal and Regulatory	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 12,216,636	$ 5,376,947	$ 2,628,404	$ 461,379	$ 563,441	$ 1,276,697	$ 1,909,768
1641	Market Analysis	15.3%	26.3%	0.0%	19.9%	31.4%	7.1%	$ 2,948,963	$ 451,783	$ 776,456	$ -	$ 586,709	$ 925,499	$ 208,515
1642	MSC	25.0%	25.0%	0.0%	25.0%	25.0%	0.0%	$ 561,750	$ 140,438	$ 140,438	$ -	$ 140,438	$ 140,438	$ -
1651	Board of Governors	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 231,400	$ 101,847	$ 49,786	$ 8,739	$ 10,672	$ 24,182	$ 36,174
1661	Compliance - General	21.9%	20.4%	11.9%	0.0%	28.5%	17.3%	$ 1,722,093	$ 377,122	$ 350,720	$ 204,913	$ -	$ 490,823	$ 298,514
1662	Compliance - Audits	8.3%	0.0%	0.0%	0.0%	50.0%	41.7%	$ 434,112	$ 36,176	$ -	$ -	$ -	$ 217,056	$ 180,880
1711	VP Market Services - General	17.1%	2.4%	9.5%	9.4%	20.3%	41.2%	$ (69,788)	$ (11,963)	$ (1,694)	$ (6,601)	$ (6,555)	$ (14,201)	$ (28,774)
1721	Billing and Settlements-General	25.0%	0.0%	0.0%	0.0%	0.0%	75.0%	$ 450,755	$ 112,689	$ -	$ -	$ -	$ -	$ 338,066
1722	Application Support	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	$ 700,651	$ -	$ -	$ -	$ -	$ -	$ 700,651
1723	Tariff and Contract Implementation	80.3%	19.7%	0.0%	0.0%	0.0%	0.0%	$ 992,025	$ 796,597	$ 195,428	$ -	$ -	$ -	$ -
1724	BBS - PSS	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	$ 1,280,172	$ -	$ -	$ -	$ -	$ -	$ 1,280,172
1725	BBS - FSS	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	$ 1,283,046	$ -	$ -	$ -	$ -	$ -	$ 1,283,046
1731	Contracts and Special Projects	43.2%	6.8%	0.0%	0.0%	0.0%	50.0%	$ 1,525,676	$ 658,584	$ 104,254	$ -	$ -	$ -	$ 762,838
1741	Client Relations	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	$ 2,366,671	$ -	$ -	$ -	$ -	$ -	$ 2,366,671
1751	Market Operations - General	30.7%	0.0%	15.3%	15.3%	34.8%	3.8%	$ 979,523	$ 300,321	$ -	$ 150,160	$ 150,160	$ 341,341	$ 37,540
1752	Manager of Markets	27.3%	5.5%	27.3%	21.8%	18.1%	0.0%	$ 2,773,203	$ 757,251	$ 151,450	$ 757,251	$ 605,801	$ 501,450	$ -
1753	Market Engineering	21.3%	0.0%	0.0%	28.4%	43.1%	7.1%	$ 1,955,609	$ 416,926	$ -	$ -	$ 555,901	$ 843,807	$ 138,975
1755	Business Solutions	5.9%	0.0%	47.3%	11.8%	29.1%	5.9%	$ 1,175,260	$ 69,443	$ -	$ 555,545	$ 138,886	$ 341,942	$ 69,443
1756	Market Quality - General	0.0%	0.0%	0.0%	0.0%	70.9%	29.1%	$ 2,102,495	$ -	$ -	$ -	$ -	$ 1,491,272	$ 611,223
1757	Market Integration	7.4%	0.0%	29.5%	29.5%	26.2%	7.4%	$ 998,732	$ 73,706	$ -	$ 294,825	$ 294,825	$ 261,669	$ 73,706
1811	VP Corporate and Strategic Development - General	44.0%	21.5%	3.6%	4.2%	10.3%	16.3%	$ 467,576	$ 205,934	$ 100,481	$ 16,932	$ 19,689	$ 48,192	$ 76,347
1821	Communications	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 847,176	$ 372,870	$ 182,269	$ 31,995	$ 39,072	$ 88,534	$ 132,435
1831	Strategic Development	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 737,340	$ 324,528	$ 158,638	$ 27,847	$ 34,007	$ 77,056	$ 115,265
1841	Human Resources	44.1%	21.5%	3.5%	3.9%	10.2%	16.8%	$ 4,624,949	$ 2,037,915	$ 993,079	$ 162,462	$ 181,785	$ 472,033	$ 777,675
1851	Project Office	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 696,828	$ 306,697	$ 149,922	$ 26,317	$ 32,138	$ 72,822	$ 108,932
1861	Regulatory Policy	44.0%	21.5%	3.8%	4.6%	10.5%	15.6%	$ 951,804	$ 418,921	$ 204,780	$ 35,946	$ 43,898	$ 99,468	$ 148,791
		41.5%	16.2%	6.7%	4.1%	9.8%	21.8%	151,735,058	62,995,426	24,505,839	10,115,593	6,208,095	14,888,585	33,021,519

Note:
Costs for ETS are further allocated to the two ETS subcategories in an 80% / 20% ratio.
SMCR costs are later reallocated in part to other service categories.

California ISO

Calculation of Financial & Capital Operating Reserve Account Balance as of 12/2002

Line	Item	Per 11/2/2002 Filing CAS	Per 11/2/2002 Filing CONG	Per 11/2/2002 Filing Market Ops/ ASREO	Per 11/2/2002 Filing Total	Actual CAS	Actual CONG	Actual Market Ops/ ASREO	Actual Total	Difference	General Notes	Allocation Notes	Allocation Percentages CAS	Allocation Percentages CONG	Allocation Percentages Market Ops/ ASREO	Allocation Percentages Total
1	BEGINNING RESERVE BALANCE, 1/1/2002	22,953	4,850	34,907	62,710	22,953	4,850	34,907	62,710		Per 2001 Section 35 Filing.		36.6%	7.7%	55.7%	100.0%
2	CALCULATION OF CONTRIBUTION TO RESERVE FROM OPERATIONS															
3	Revenue:															
4	GMC Rates: 2002 Revenue	132,866	29,105	62,364	224,334	133,297	28,438	62,735	224,470	136	2002 Collections, updated figures replacing those from 11/2/2002 filing. Actual collections per accounting records. Includes post audited adjustments.	Actual collections.	59.4%	12.7%	27.9%	100.0%
5	Other (Interest Income, WECC reimbursement)	2,473	311	1,024	3,808	2,523	335	1,061	3,920	112	Updated figures replacing those from 11/2/2002 filing. SC Application fees: $11.5, WECC reimbursement: $1,127, interest and other: $2,781	Security coordinator fees assigned to CAS, remainder (mainly interest) spread proportionately.	64.4%	8.5%	27.1%	100.0%
6	Expenses:															
7	O&M	(95,742)	(18,014)	(53,209)	(166,965)	(89,706)	(16,878)	(49,854)	(156,438)	10,527	Updated based on actual 2002 results. (Per supporting schedules for audited F/S) less, depreciation/amortization= $152,328 and excluding $4,110 of capitalized internal labor costs. Net is: $156,438	Per 2002 cost allocation matrix, O&M costs.	57.3%	10.8%	31.9%	100.0%
8	Debt Service	(20,092)	(4,481)	(19,938)	(44,510)	(19,782)	(4,412)	(19,631)	(43,825)	685	Updated based on actual 2002 results. (Per supporting schedules for audited F/S). Interest is $10,458. Principal amount is $33,367 (payments to Trustee in 2002). Interest is at higher rate from 2000 swap, offset by interest income from GIC, included in other income above.	Variance spread proportionately. Allocation based on filed 2001 debt service allocation factors.	45.1%	10.1%	44.8%	100.0%
8a	Cash Funded CapEx	(5,559)	(645)	(2,096)	(8,301)	(5,559)	(645)	(2,096)	(8,301)	-	As planned, any variance would be below in Line 11.		67.0%	7.8%	25.3%	100.0%
9	Contribution to Operating Reserve	13,946	6,275	(11,855)	8,367	20,773	6,837	(7,785)	19,826	11,459						
10	OTHER RESERVE USES															
11	Use of Reserve for CapEx	(3,589)	(2,617)	(7,494)	(13,699)	(3,698)	(2,696)	(7,721)	(14,116)	(417)	Actual of $22,417 (located on this line and line 8a)	Per 2002 cost allocation matrix.	26.2%	19.1%	54.7%	100.0%
12	Amendment 33 Fines	(11,136)	(2,088)	(9,976)	(23,200)	(11,136)	(2,088)	(9,976)	(23,200)	-	Actual fines provided toward 2002 rates per 11/2/2001 filing. As of 10/2003, total fines collections are $60.7 million, $19.96 million is likely to be retained by ISO (toward GMC rates), while remainder is to be reduced/returned to parties assessed. $43.161 was recognized in the Operating Reserve in the previous year, and reduced by $23,200 to a total of $19.96.	Allocated based on proportion of forecasted GMC collections in 2001.	48.0%	9.0%	43.0%	100.0%
12a	Reallocation of Fines per 2002 GMC Settlement	(4,065)	(1,151)	5,216	(0)	(4,065)	(1,151)	5,216	(0)	-	Reallocation per terms of 2002 GMC Settlement	Up to $9 million reallocated per 2002 GMC settlement.				
13	Interest on Refunds from 2002 GMC Settlement	*(46)*	*(29)*	*(85)*	*(160)*	*(142)*	*(27)*	*(127)*	*(295)*	(135)	Refund on excess 2002 GMC collections per Settlement Agmt paid in February 2003, later than anticipated.	Same as above.	48.0%	9.0%	43.0%	100.0%
14	*2001 GMC Case Refunds per 5/2/2003 FERC Order (related to 2001 incentive compensation)*					*(923)*	*(133)*	*(743)*	*(1,800)*	(1,800)	*Order 463 indicated $1.8 million in "overbudgeted" incentive compensation should be returned as a refund to 2001 ratepayers. ISO has filed a request for rehearing on this.*	*Allocated with 2001 GMC O&M budget factors.*	51.3%	7.4%	41.3%	100.0%
15	*Matters Pending Dispute Resolution, Litigation or Appeal including interest on potential awards or judgment.*					*(13,567)*	*(1,335)*	*(2,724)*	*(17,626)*	(17,626)	*The outcome of several matters is pending, and until such time as a final determination is made, amounts potentially payable are set aside in this reserve calculation.*	*Allocation is detailed for each item.*	77.0%	7.6%	15.5%	100.0%
16	*Interest on Excess collection of Amendment 33 fines.*					*(585)*	*(69)*	*(1,465)*	*(2,118)*		*Interest through 12/31/2002 on Amend 33 fines likely to be returned. $60.7 million collections less $19.9 million to keep, difference of $40.8 million. Interest calculated at FERC interest rate.*	*Allocated in same proportion as total Amend 33 Fines collected*	27.6%	3.2%	69.1%	100.0%
17	*Interest on 2001 GMC Case Refunds per 5/2/2003 FERC Order (related to incentive compensation)*					*(63)*	*(9)*	*(51)*	*(122)*	(122)	*Estimate of interest related to the $1.8 million refund from 2001 to end of year 2002.*	*Allocated with 2001 GMC O&M budget factors.*	51.3%	7.4%	41.3%	100.0%
18	Net Increase in Operating Reserve (Sum Lines 9-17)	(4,891)	391	(24,193)	(28,693)	(13,406)	(670)	(25,375)	(39,452)	(10,759)						
19	Ending Reserve Balance	18,062	5,241	10,714	34,018	9,547	4,180	9,532	23,259	(10,759)						
20	Less: Reserve Requirement (15% of 2003 Budget, Line	16,066	2,694	7,001	25,761	16,066	2,694	7,001	25,761							
21	*FY2003 Operating Budget*	*107,105*	*17,958*	*46,675*	*171,739*	*107,105*	*17,958*	*46,675*	*171,739*							
22	Equals: Revenue Credit Available	1,996	2,547	3,713	8,257	(6,519)	1,487	2,530	(2,502)	(10,759)						

California ISO
Calculation of Available Revenue Credit for 2004

#		Budget CAS	Budget CONG	Budget Market Ops/ ASREO	Budget Total	Actual/Forecast CAS	Actual/Forecast CONG	Actual/Forecast Market Ops/ ASREO	Actual/Forecast Total	Difference	General Notes	Allocation Notes	Allocation Percentages CAS	Allocation Percentages CONG	Allocation Percentages Market Ops/ ASREO	Allocation Percentages Total
1	BEGINNING RESERVE BALANCE, 1/1/2003	$ 18,062	$ 5,241	$ 10,714	$ 34,018	$ 9,547	$ 4,180	$ 9,532	$ 23,259							
2	CALCULATION OF CONTRIBUTION TO RESERVE FROM OPERATIONS															
3	Revenue:															
4	GMC Rates: 2003 Calendar Year Revenue	137,857	27,401	72,343	237,601	136,604	29,263	84,437	250,304	12,703	Actuals/estimated through September, forecast amounts for October - December (based on trend during first 9 months of 2003)		54.6%	11.7%	33.7%	100.0%
5	Other (Interest Income, WECC reimbursement)	1,993	148	487	2,628	2,269	207	658	3,134	506	2003 through September amounts exceed budget by $506K. Forecast is for budget plus $506K.	Security coordinator fees assigned to CAS. Remainder (mainly interest) spread proportionately. Allocation is per 11/8/2002 CAM: page 14, Line 249.	80.3%	5.5%	14.2%	100.0%
6	Expenses:															
7	O&M	(107,047)	(18,001)	(46,691)	(171,739)	(104,664)	(17,640)	(45,696)	(168,000)	3,739	Per accounting forecast at 8/28/2003, of $164 million, increased to $168 million for additions affecting 2003	Allocation: Per 11/8/2002 filing (CAM: page 14 Line 243)	62.3%	10.5%	27.2%	100.0%
8	Debt Service	(22,392)	(5,067)	(16,338)	(43,797)	(22,449)	(5,096)	(16,387)	(43,932)	(135)	Principal: payments to trustee in 2003: $34,800. Interest: $9,132 budgeted.	Allocation: Actual 2003: budget as allocated in CAM.	51.1%	11.6%	37.3%	100.0%
9	Cash Funded CapEx	(9,081)	(5,617)	(7,302)	(22,000)	(9,081)	(5,617)	(7,302)	(22,000)	-	Additional use of reserve for CapEx is shown below.	Allocation per 11/8/2002 filing, cash funded CapEx. CAM: page 16, Line 332.	41.3%	25.5%	33.2%	100.0%
10	Contribution to Operating Reserve (Sum lines 2 throug	1,330	(1,136)	2,499	2,693	2,679	1,117	15,710	19,506	16,813						
11	OTHER RESERVE USES															
12	Interest on Excess Collections of Amendment 33 Fines					(531)	(62)	(1,328)	(1,921)	(1,921)	*Interest for year 2003 on Amend 33 fines likely to be returned. $60.7 million collections less $19.9 million to keep, difference of $34.8 million. Interest at 4.125% (average FERC interest rate in 2003).*	*Allocated in same proportion as total Amend 33 Fines collected*	27.6%	3.2%	69.1%	100.0%
14	Interest on 2001 GMC Case: Incentive Comp.					(41)	(6)	(33)	(79)	(79)	*Calculated using FERC interest rates on 2001 GMC overassessment of $1.8 million. Interest is for year 2003.*	*Allocated with 2001 GMC O&M budget factors.*	51.3%	7.4%	41.3%	100.0%
15	*Matters Pending Dispute Resolution, Litigation or Appeal including interest on potential awards or judgment.*					(119)	-	(50)	(169)	(169)	*The outcome of several matters is pending, and until such time as a final determination is made, amounts potentially payable are P24*	*Allocation is detailed for each item.*	70.4%	0.0%	29.6%	100.0%
	Net Increase in Operating Reserve	1,330	(1,136)	2,499	2,693	1,988	1,049	14,299	17,336	14,643						
	Ending Reserve Balance	19,392	4,105	13,214	36,711	11,535	5,229	23,831	40,595	3,884						
	Less: Reserve Requirement (15% of 2003 Budget)					12,063	2,504	8,194	22,760							
	FY2004 Operating Budget					*80,420*	*16,691*	*54,625*	*151,735*							
	Equals: Revenue Credit Available					$ (528)	$ 2,726	$ 15,637	$ 17,835							

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California Independent System Operator
Statement BL
Rate Design Information
December 31, 2004

2004 Rate Design Information is discussed in the testimony of Barbara Barkovich and Cathy Yap. Statement BA and BD provide rate category and billing determinant information.

California Independent System Operator
Statement BM
Construction Program Statement
December 31, 2004

The California ISO is not requesting a return on assets under construction.

During 2004, the ISO will have software and other assets under-development.
See Statement AM for details.