

**BEFORE THE
PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Investigation into)	
Implementation of Assembly Bill 970 Regarding)	I.00-11-001
the Identification of Electric Transmission and)	
Distribution Constraints, Actions to Resolve)	
Those Constraints, and Related Matters)	
Affecting the Reliability of Electric Supply.)	
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**COMMENTS OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION
ON THE REPORT OF THE TEHACHAPI COLLABORATIVE STUDY GROUP**

Charles F. Robinson, General Counsel
Sidney M. Davies, Senior Regulatory Counsel
Grant A. Rosenblum, Regulatory Counsel
California Independent System Operator
151 Blue Ravine Road
Folsom, CA 95630
Telephone: 916-351-4400
Facsimile: 916-351-2350

Attorneys for the
California Independent System Operator

Dated: April 6, 2005

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The California Independent System Operator Corporation (“CAISO”) actively participated in the subgroup that led the Tehachapi Collaborative Study Group process, performed and reviewed power flow and production cost analyses of the transmission alternatives, determined the technical criteria underlying the recommendations, and drafted the Report. As such, the CAISO supports the Report, which, in large part, fully incorporates the opinions and conclusions of CAISO staff and therefore reduces the present need for substantial opening comments. The CAISO anticipates addressing in reply comments any concerns with the Report raised by other entities. Nevertheless, the CAISO believes several points warrant emphasis.

1. The Commission Must Consider and Provide for the Further Study of Operational Issues Associated with Connecting Intermittent Wind Resources to the Grid

The Commission must remain cognizant of the uncertainties and operational challenges associated with integrating the large quantity of intermittent wind power anticipated at the Tehachapi area with the electrical grid. Chapter 4 of the Report details several of the key operational issues:

- **Regulation** – Regulating resources are those quickly adjustable generating units used to meet the system’s need for a second by second matching of load and generation. As the potential variation in the output of wind generation increases with increased development of wind resources, the need for regulation is also likely to increase. Many thermal units are unable to adjust their output quickly enough to provide regulation. Accordingly, the effect of increased wind generation on the sufficiency of regulation resources and the CAISO’s ability to maintain NERC and WECC control standards must be considered and studied. At the present time, the California Energy Commission is evaluating regulation related issues.
- **Ramp Rates** – Generally, load come on very quickly in the morning and decreases very quickly in the evening, creating steep system ramps. Resources need to be dispatched in near real-time to match these ramps. To the extent that wind generation increases these ramps, or creates new ramps within an hour, this could lead to increases in the amount of generation needed to be dispatched in real-time to accommodate the ramps.
- **Load Following in Real-Time** – To correct for the inevitable mismatch between forecasted load and generation, dispatchable resources must be available. The present uncertainties with intermittent generation output may increase the need for load-following resources.
- **Frequency Response Issues** – When a generator trips on the system, the other generators on the system will see a drop in frequency and automatically initiate changes in their output to correct the mismatch between generation and load to maintain system frequency. Wind resources are generally not effective in providing system frequency control. An area with a large amount of generation that cannot provide frequency response creates operational risks and, for the case of additional wind generation in southern California, may reduce the transmission system’s ability to import power into California from areas such as the Pacific northwest.

- Accommodating the Daily Load Pattern – Tehachapi wind generation will generally operate at high levels only during off-peak times, while operating at low levels during peak periods. This will decrease the need for base load generation, which can lead to the need to cycle the base load thermal units more frequently than intended or designed. As such, it will be necessary to study the need to couple energy storage technologies, such as pumped hydro generation, with plans for additional wind generation. Using storage technologies to store the off-peak generation for later use during peak load periods will likely be necessary to integrate large quantities of wind generation in southern California. This Commission and other State policy-makers must consider this need before deciding on California's future portfolio of resources.

The CAISO is committed to formulating effective solutions to the foregoing operational concerns in order to meet the State's stated goal of increasing renewable resources and particularly wind generation. As noted in the Report, the CAISO and CEC are currently engaged in efforts to study the effects of Tehachapi wind generation on operational and integration issues. However, the Commission should recognize that the tendency of these efforts and the uncertainty of their outcomes may, and should, ultimately effect the scope and timing of wind development in the Tehachapi area. Indeed, Chapter 4 of the Report prudently highlights that transmission availability does not represent the sole challenge to wind generation in the Tehachapi area and that additional operational analyses must be completed as a precondition to the realization of the full vision of the Tehachapi wind resource region.

2. The Report is a First Step in an Ongoing Study Process

Consistent with the foregoing, the Report constitutes a preliminary, conceptual plan for the export of Tehachapi wind power. Chapter 7 of the Report outlines the need for additional technical studies prior to adoption of a definitive plan. For instance, the Report notes that the identified alternatives to providing Tehachapi resources with access to statewide markets need more analysis, that additional production cost simulations must be run on the potential


alternatives, and that additional transmission planning studies, including dynamic stability, voltage support, and short-circuit, are necessary inputs to a definitive plan. Again, the CAISO emphasizes that the outcome of these studies and the issues upon which they are founded are likely to affect the viability of wind development in the Tehachapi area by impacting, among other things, the scope of the facilities, the phasing of the facilities, and their cost.

3. The Commission Must Ensure that Adequate Resources Are Dedicated to Further Study the Tehachapi Area as Well as Other Potential Renewable Resource Regions

As noted in Chapter 8 of the Report regarding “lessons learned,” D.04-06-010 established that each party in the study group would pay its own costs. Indeed, the Report notes that future studies could benefit from conducting production simulation studies using the CAISO’s Transmission Economic Analysis Methodology (TEAM), or similar methodology, to provide least-cost best-fit information for the investor owned utilities procurement process. However, the CAISO has a limited modeling budget and staff and the Commission should recognize there may be a need for supplemental funding for the hiring of consultants to complete such future modeling efforts.

April 6, 2005

Respectfully Submitted:

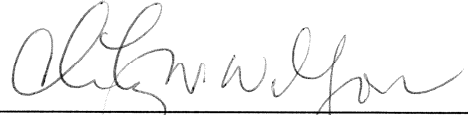
By: 

Grant A. Rosenblum
Attorney for
California Independent System Operator

PROOF OF SERVICE

I hereby certify that on April 6, 2005 I served, by electronic mail, the Comments of the California Independent System Operator on the Report of the Tehachapi Collaborative Study Group to the parties on the service list in Docket # I.00-11-001.

DATED at Folsom, California on April 6, 2005.

A handwritten signature in cursive script, appearing to read "Charity N. Wilson", written over a horizontal line.

Charity N. Wilson
An Employee of the California
Independent System Operator

PERRY COLE
SR. VP TRANS-ELECT NTD
3420 N. HILLCREST
BUTTE, MT 59701

I.00-11-001

CASE ADMINISTRATION
SOUTHERN CALIFORNIA EDISON COMPANY
2244 WALNUT GROVE AVENUE, RM. 370
ROSEMEAD, CA 91770

I.00-11-001

MICHAEL D. MACKNESS
SOUTHERN CALIFORNIA EDISON COMPANY
PO BOX 800
ROSEMEAD, CA 91770

I.00-11-001

CHRIS BING
SAN DIEGO GAS & ELECTRIC
8330 CENTURY PARK COURT, CP02-170
SAN DIEGO, CA 92123

I.00-11-001

HAROLD M. ROMANOWITZ
OAK CREEK ENERGY SYSTEMS, INC.
14633 WILLOW SPRINGS ROAD
MOJAVE, CA 93501

I.00-11-001

MATTHEW FREEDMAN
THE UTILITY REFORM NETWORK
711 VAN NESS AVENUE, SUITE 350
SAN FRANCISCO, CA 94102

I.00-11-001

JUDI K. MOSLEY
PACIFIC GAS AND ELECTRIC CO
77 BEALE STREET
SAN FRANCISCO, CA 94105

I.00-11-001

JOSEPH KARP
WHITE & CASE LLP
3 EMBARCADERO CTR STE 2210
SAN FRANCISCO, CA 94111-4050

I.00-11-001

BARRY R. FLYNN
FLYNN RESOURCE CONSULTANTS, INC.
5440 EDGEVIEW DRIVE
DISCOVERY BAY, CA 94514

I.00-11-001

CHRISTOPHER J. MAYER
MODESTO IRRIGATION DISTRICT
PO BOX 4060
MODESTO, CA 95352-4060

I.00-11-001

RANDALL W. KEEN
MANATT PHELPS & PHILLIPS, LLP
11355 WEST OLYMPIC BLVD.
LOS ANGELES, CA 90064

I.00-11-001

JORGE CHACON
SOUTHERN CALIFORNIA EDISON COMPANY
2244 WALNUT GROVE AVE.
ROSEMEAD, CA 91770

I.00-11-001

MEREDITH ALLEN
SEMPRA ENERGY
101 ASH STREET
SAN DIEGO, CA 92101

I.00-11-001

KEVIN O'BEIRNE
SAN DIEGO GAS & ELECTRIC COMPANY
8330 CENTURY PARK COURT, CP32B
SAN DIEGO, CA 92123-1530

I.00-11-001

SARA PICTOU
OAK CREEK ENERGY SYSTEMS, INC.
14633 WILLOW SPRINGS ROAD
MOJAVE, CA 93501

I.00-11-001

James E. Scarff
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
ROOM 5121
SAN FRANCISCO, CA 94102-3214

I.00-11-001

BRIAN T. CRAGG
GOODIN MACBRIDE SQUERI RITCHIE & DAY LLP
505 SANSOME STREET, SUITE 900
SAN FRANCISCO, CA 94111

I.00-11-001

DAVID T. KRASKA
PACIFIC GAS & ELECTRIC COMPANY
MAILCODE B30A, PO BOX 7442
SAN FRANCISCO, CA 94120-7442

I.00-11-001

CLYDE MURLEY
CONSULTING ON ENERGY AND ENVIRONMENT
600 SAN CARLOS AVENUE
ALBANY, CA 94706

I.00-11-001

GRANT ROSENBLUM
CAL INDEPENDENT SYSTEM OPERATOR
110 BLUE RAVINE ROAD
FOLSOM, CA 95630

I.00-11-001

DANIEL W. DOUGLASS
DOUGLASS & LIDDELL
21700 OXNARD STREET, SUITE 1030
WOODLAND HILLS, CA 91367-8102

I.00-11-001

JULIE A. MILLER
SOUTHERN CALIFORNIA EDISON COMPANY
2244 WALNUT GROVE AVENUE, RM. 345
ROSEMEAD, CA 91770

I.00-11-001

KELLY M. MORTON
SAN DIEGO GAS & ELECTRIC
101 ASH STREET
SAN DIEGO, CA 92101-3017

I.00-11-001

JOHN W. LESLIE
LUCE, FORWARD, HAMILTON & SCRIPPS, LLP
11988 EL CAMINO REAL, SUITE 200
SAN DIEGO, CA 92130

I.00-11-001

NORMAN J. FURUTA
DEPARTMENT OF THE NAVY
2001 JUNIPERO SERRA BLVD., SUITE 600
DALY CITY, CA 94014-3890

I.00-11-001

Laurence Chaset
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
ROOM 5131
SAN FRANCISCO, CA 94102-3214

I.00-11-001

MICHAEL B. DAY
GOODIN MACBRIDE SQUERI RITCHIE & DAY LLP
505 SANSOME STREET, SUITE 900
SAN FRANCISCO, CA 94111

I.00-11-001

SARA STECK MYERS
LAW OFFICES OF SARA STECK MYERS
122 - 28TH AVENUE
SAN FRANCISCO, CA 94121

I.00-11-001

NANCY RADER
CALIFORNIA WIND ENERGY ASSOCIATION
1198 KEITH AVENUE
BERKELEY, CA 94708

I.00-11-001

DOUGLAS K. KERNER
ELLISON, SCHNEIDER & HARRIS LLP
2015 H STREET
SACRAMENTO, CA 95814

I.00-11-001

STEVEN KELLY
INDEPENDENT ENERGY PRODUCERS ASSN
1215 K STREET, SUITE 900
SACRAMENTO, CA 95814

I.00-11-001

LYNN HAUG
ELLISON, SCHNEIDER & HARRIS, LLP
2015 H STREET
SACRAMENTO, CA 95814-3109

I.00-11-001

JAMES H. CALDWELL JR.
PPM ENERGY
1125 NW COUCH STREET, SUITE 700
PORTLAND, OR 97209

I.00-11-001

STEVE MUNSON
VULCAN POWER COMPANY
1183 NW WALL STREET, SUITE G
BEND, OR 97701

I.00-11-001

SCOTT HEMPLING
LAW OFFICES OF SCOTT HEMPLING
417 ST. LAWRENCE DRIVE
SILVER SPRING, MD 20901

I.00-11-001

TIM WOOD
AMERICAN SUPERCONDUCTOR
PO BOX 26354
SCOTTSDALE, AZ 85255

I.00-11-001

BRIAN KOCH
LADWP
111 N. HOPE ST., RM. 951
LOS ANGELES, CA 90012

I.00-11-001

ROBERT L. PETTINATO
LOS ANGELES DEPARTMENT OF WATER & POWER
PO BOX 51111, RM. 1148
NATURAL GAS GROUP ENERGY CONTROL CENTER
LOS ANGELES, CA 90051-0100

I.00-11-001

DAVID L. HUARD
MANATT, PHELPS & PHILLIPS, LLP
11355 WEST OLYMPIC BOULEVARD
LOS ANGELES, CA 90064

I.00-11-001

TOM MURPHY
ASPEN ENVIRONMENTAL GROUP
30423 CANWOOD STREET, SUITE 215
AGOURA HILLS, CA 91301

I.00-11-001

PETER T. LEVITT
CALWIND RESOURCES, INC.
2659 TOWNSGATE ROAD, NO. 122
WESTLAKE VILLAGE, CA 91361

I.00-11-001

JACK MCNAMARA
GEO-ENERGY PARTNERS-1983 LTD.
PO BOX 1380
AGOURA HILLS, CA 91376

I.00-11-001

JEFFERY S. GHILARDI
848 INSPIRATION LANE
ESCONDIDO, CA 92025

I.00-11-001

DONALD C. LIDDELL P. C.
DOUGLASS & LIDDELL
2928 2ND AVENUE
SAN DIEGO, CA 92103

I.00-11-001

ABBAS M. ABED
SAN DIEGO GAS & ELECTRIC
8315 CENTURY PARK COURT, CP21D
SAN DIEGO, CA 92123

I.00-11-001

CENTRAL FILES
SAN DIEGO GAS & ELECTRIC
8330 CENTURY PARK COURT
CP31-E
SAN DIEGO, CA 92123-1530

I.00-11-001

JOHN STEFFEN
IMPERIAL IRRIGATION DISTRICT
333 EAST BARIONI BOULEVARD
IMPERIAL, CA 92251

I.00-11-001

BOB GUILLIAMS
VALMONT-NEWMARK
3970 LENWOOD RD.
BARSTOW, CA 92311

I.00-11-001

TONY PARISI
NAVAIR RANGE DEPARTMENT
575 I AVENUE STE. 1
POINT MUGU, CA 93042

I.00-11-001

LINDA WHITE
KERN WIND ENERGY ASSOCIATION
PO BOX 41616
BAKERSFIELD, CA 93384

I.00-11-001

DWIGHT A. DEAKIN
AIR FORCE FLIGHT TEST CENTER
1 SOUTH ROSAMOND BLVD.
EDWARD AFB, CA 93524-1036

I.00-11-001

DIANE I. FELLMAN
LAW OFFICES OF DIANE I. FELLMAN
234 VAN NESS AVENUE
SAN FRANCISCO, CA 94102

I.00-11-001

DEVRA BACHRACH
NATURAL RESOURCES DEFENSE COUNCIL
111 SUTTER STREET, 20TH FLOOR
SAN FRANCISCO, CA 94104

I.00-11-001

HEDY BORN
235 MONTGOMERY STR., STE. 935
SAN FRANCISCO, CA 94104

I.00-11-001

SUSAN V. LEE
ASPEN ENVIRONMENTAL GROUP
235 MONTGOMERY STREET, ROOM 935
SAN FRANCISCO, CA 94104

I.00-11-001

BERNARD LAM
PACIFIC GAS AND ELECTRIC COMPANY
77 BEALE STREET, ROOM 1323
SAN FRANCISCO, CA 94105

I.00-11-001

JOE MIGOCKI
PACIFIC GAS AND ELECTRIC COMPANY
77 BEALE STREET, MAIL CODE B9A
SAN FRANCISCO, CA 94105-1890

I.00-11-001

CALIFORNIA ENERGY MARKETS
517-B POTRERO AVENUE
SAN FRANCISCO, CA 94110

I.00-11-001

MARTIN A. MATTES
NOSSAMAN GUTHNER KNOX & ELLIOTT, LLP
50 CALIFORNIA STREET, 34TH FLOOR
SAN FRANCISCO, CA 94111

I.00-11-001

LULU WEINZIMER
CALIFORNIA ENERGY CIRCUIT
695 9TH AVE. NO.2
SAN FRANCISCO, CA 94118

I.00-11-001

KEITH WHITE
931 CONTRA COSTA DRIVE
EL CERRITO, CA 94530

I.00-11-001

RYAN WISER
BERKELEY LAB
ONE CYCLOTRON ROAD
MS-90-4000
BERKELEY, CA 94720

I.00-11-001

DAVID MORSE
1411 W, COVELL BLVD., SUITE 106-292
DAVIS, CA 95616-5934

I.00-11-001

ROBERT SPARKS
CALIFORNIA ISO
151 BLUE RAVINE ROAD
FOLSOM, CA 95630

I.00-11-001

WILLIAM W. WESTERFIELD, III
STOEL RIVES LLP
770 L STREET, SUITE 800
SACRAMENTO, CA 95814

I.00-11-001

DON WINSLOW
PPM ENERGY
1125 N.W. COUCH, SUITE 700
PORTLAND, OR 97209

I.00-11-001

JON DAVIDSON
ASPEN ENVIRONMENTAL GROUP
30423 CANWOOD STREET, SUITE 215
AGOURA HILLS, CA 91301

I.00-11-001

Billie C Blanchard
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
AREA 4-A
SAN FRANCISCO, CA 94102-3214

I.00-11-001

Dan Adler
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
ROOM 5119
SAN FRANCISCO, CA 94102-3214

I.00-11-001

John Boccio
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
AREA 4-A
SAN FRANCISCO, CA 94102-3214

I.00-11-001

WILLIAM F. DIETRICH
DIETRICH LAW
2977 YGNACIO VALLEY ROAD, 613
WALNUT CREEK, CA 94598-3535

I.00-11-001

DENNIS SCULLION
ENXCO, INC
17401 WEST COMMERCE WAY
TRACY, CA 95377

I.00-11-001

CAROLYN M. KEHREIN
ENERGY MANAGEMENT SERVICES
1505 DUNLAP COURT
DIXON, CA 95620-4208

I.00-11-001

RANDALL HUNT
NAVIGANT CONSULTING
3100 ZINFANDEL DRIVE, SUITE 600
RANCHO CORDOVA, CA 95670-6078

I.00-11-001

HAMID KAZEROONI
HENWOOD ENERGY SERVICES
2379 GATEWAY OAKS DRIVE, SUITE 100
SACRAMENTO, CA 95833

I.00-11-001

JON FISCHER
PPM ENERGY INC.
1125 NW COUCH ST., SUITE 700
PORTLAND, OR 97209

I.00-11-001

NEGAR VAHIDI
ASPEN ENVIRONMENTAL GROUP
30423 CANWOOD STREET, SUITE 215
AGOURA HILLS, CA 91301

I.00-11-001

Brian D. Schumacher
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
AREA 4-A
SAN FRANCISCO, CA 94102-3214

I.00-11-001

Darwin Farrar
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
ROOM 4107
SAN FRANCISCO, CA 94102-3214

I.00-11-001

Judy Cooper
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
AREA 2-E
SAN FRANCISCO, CA 94102-3214

I.00-11-001

JOHN GALLOWAY
UNION OF CONCERNED SCIENTISTS
2397 SHATTUCK AVENUE, SUITE 203
BERKELEY, CA 94704

I.00-11-001

DICK TIMMONS
ENXCO, INC.
17401 WEST COMMERCE WAY
TRACY, CA 95377

I.00-11-001

JEFFREY MILLER
CALIFORNIA INDEPENDENT SYSTEM OPERATOR
151 BLUE RAVINE ROAD
FOLSOM, CA 95630

I.00-11-001

ED CHANG
FLYNN RESOURCE CONSULTANTS, INC.
2165 MOONSTONE CIRCLE
EL DORADO HILLS, CA 95762

I.00-11-001

RICHARD LAUCKHART
HENWOOD ENERGY SERVICES, INC.
2379 GATEWAY OAKS DRIVE, SUITE 200
SACRAMENTO, CA 95833

I.00-11-001

Maxine Harrison
CALIF PUBLIC UTILITIES COMMISSION
320 WEST 4TH STREET SUITE 500
EXECUTIVE DIVISION
LOS ANGELES, CA 90013

I.00-11-001

Aaron J Johnson
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
ROOM 5210
SAN FRANCISCO, CA 94102-3214

I.00-11-001

Charlotte TerKeurst
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
ROOM 5021
SAN FRANCISCO, CA 94102-3214

I.00-11-001

Jesse A Ante
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
AREA 4-A
SAN FRANCISCO, CA 94102-3214

I.00-11-001

Kelly C Lee
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
ROOM 4102
SAN FRANCISCO, CA 94102-3214

I.00-11-001

Kenneth Lewis
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
ROOM 4002
SAN FRANCISCO, CA 94102-3214

I.00-11-001

Paul Douglas
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
AREA 4-A
SAN FRANCISCO, CA 94102-3214

I.00-11-001

Scott Logan
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
ROOM 4209
SAN FRANCISCO, CA 94102-3214

I.00-11-001

Carlos A Machado
CALIF PUBLIC UTILITIES COMMISSION
770 L STREET, SUITE 1050
SACRAMENTO, CA 95814

I.00-11-001

MONICA SCHWEBS
CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET, MS-14
SACRAMENTO, CA 95814

I.00-11-001

DRAKE JOHNSON
CALIFORNIA ENERGY COMMISSION
1516, 9TH STREET, MS 45
SACRAMENTO, CA 95814-5512

I.00-11-001

Lainie Motamedi
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
ROOM 5119
SAN FRANCISCO, CA 94102-3214

I.00-11-001

Philippe Auclair
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
ROOM 5218
SAN FRANCISCO, CA 94102-3214

I.00-11-001

Shannon Eddy
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
ROOM 4102
SAN FRANCISCO, CA 94102-3214

I.00-11-001

CLARE LAUFENBERG
CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET, MS 46
SACRAMENTO, CA 95814

I.00-11-001

Thomas Flynn
CALIF PUBLIC UTILITIES COMMISSION
770 L STREET, SUITE 1050
SACRAMENTO, CA 95814

I.00-11-001

JUDY GRAU
CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET MS-46
SACRAMENTO, CA 95814-5512

I.00-11-001

Pamela Nataloni
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
ROOM 4300
SAN FRANCISCO, CA 94102-3214

I.00-11-001

Robert Elliott
CALIF PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
AREA 4-A
SAN FRANCISCO, CA 94102-3214

I.00-11-001

Alan Lofaso
CALIF PUBLIC UTILITIES COMMISSION
770 L STREET, SUITE 1050
SACRAMENTO, CA 95814

I.00-11-001

KAREN GRIFFIN
CALIFORNIA ENERGY COMMISSION
1516 9TH STREET, MS 39
SACRAMENTO, CA 95814

I.00-11-001

DON KONDOLEON
CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET, MS-46
SACRAMENTO, CA 95814-5512

I.00-11-001