



California ISO

**2023 Cost-of-Service Study and
2024 through 2026 Grid Management
Charges and Supplement Service Fees
Update**

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Executive Summary

The CAISO completed its triennial Cost-of-Service study (2023 Cost-of-Service study) in accordance with its Tariff (Appendix F, Schedule 1). The study analyzes cost and time data to determine how much time and resources staff uses to support the services that the CAISO offers. The study's results are used to update the Grid Management Charge (GMC) Revenue Requirement percentage allocations to the Market Services, System Operations, and Congestion Revenue Rights Services (CRR Services) cost categories. The study results are also used to update the Western Energy Imbalance Market (WEIM) cost category percentages and the Reliability Coordinator (RC) funding percentage. Finally, the study is used to analyze the costs to support supplemental services such as, the Transmission Ownership Rights (TOR) services, and set the charges, fees, and rates for these supplemental services accordingly.

The 2023 Cost-of-Service study analyzes the 2024 through 2026 revenue requirements under two scenarios. The first scenario assumes pre-Extended Day Ahead Market (EDAM) and impacts the analysis of the 2024 revenue requirement. While the second scenario assumes EDAM and impacts the analysis of the 2025 and 2026 revenue requirements. The results of the study indicate no change in the percentage allocations to the GMC cost categories, minor changes to the WEIM cost category percentages and RC funding percentage, and only a change in the TOR services rate in the supplemental fees.

Additionally, as part of the 2023 Cost-of-Service study, the CAISO is proposing to bifurcate its System Operations Charges to a System Operations Real-Time Dispatch Charge and a System Operations Balance Authority Area Services Charge effective in 2025. As the bifurcation of the System Operations Charge is already part of the WEIM Administrative Charge calculations, this proposal will simplify the process by removing a step in the charge calculation process and provide for greater detail in the calculations. In addition, the new Systems Operations Real-Time Dispatch Charge will supersede the WEIM System Operations Charge and the recently proposed EDAM Systems Operations Charge. This change will have no financial impact on customers as it simply changes how CAISO collects for these costs.

Another component of the 2023 Cost-of-Service study is the proposal of an EDAM transitional load ramp-in period that will provide for incremental costs for WEIM entities extending participation to the EDAM. The model includes a load volume based ramp-in of charges that will be offered only during the initial four years of the EDAM

(2025 thru 2028); ramp-in will only apply to load, and not supply based, volumes to avoid providing any suppliers with a competitive advantage in the market. The ramp-in will gradually increase year over year starting with charges no less than the WEIM load-based charges. This ramp-in approach aligns benefits with costs, accounting for transmission and load served by the CAISO balancing authority area and the EDAM entity areas. The ramp-in approach will support introduction and growth of the EDAM, which will reduce GMC rates for all existing CAISO market participants due to the additional supply and demand volumes participating in the market starting the first year.

Finally, the GMC Revenue Requirement cap has remained unchanged since 2015 at \$202 million. The CAISO is proposing no change in the revenue requirement cap for 2024, an increase to \$245 million in 2025, and an increase to \$250 million in 2026. The increases in the cap amount are primarily needed to accommodate the accounting treatment of the incoming EDAM revenues and GMC Revenue Requirement structure changes.

Most of the changes proposed in this paper will not require approval from the Board of Governors, and thus do not require a decisional classification. The tariff provides that the results of each triennial Cost-of-Service study will be used to recalculate percentage allocations to each service cost category and the other rates and fees that comprise the GMC, and to “submit tariff changes to reflect such changes.” (See Tariff Appendix F, Schedule 1.) This applies to the TOR charge and the RC funding percentage. (See Tariff Section 11.22.4 and Appendix F, Schedule 7.) Accordingly, and consistent with how the CAISO presented the changes from the 2020 Cost-of-Service study¹, these changes and the results of the study generally will be presented to the CAISO Board of Governors and WEIM Governing Body on an informational basis, without plans to request a vote.

This initiative does include three groups of tariff changes that go beyond the allocation of the GMC among its service cost categories and fees, and these will require a vote of approval.

- Bifurcating the System Operations Charge, by eliminating it effective January 1, 2025 and replacing it with two new charges: System Operations Real-Time Dispatch Charge and a System Operations Balance Authority Area Services Charge.
- Establishing the EDAM transitional ramp-in of load volumes during the period of 2025 through 2028.

¹ See the September 2020 memorandum to the ISO Board of Governors, available [here](#), which proposes percentage changes to the allocation within service categories but does not propose a vote on these changes; according to the September 2020 memorandum to the WEIM Governing Body, available [here](#), which does not require action by the Governing Body.

- Revision of the GMC Revenue Requirement cap effective 1/1/2025.

CAISO staff believes that these three changes fall within the joint authority of the ISO Board of Governors and the WEIM Governing Body. The two bodies have joint authority over any proposal to change or establish any CAISO tariff rule(s) applicable to the WEIM Entity balancing authority areas, the WEIM Entities, or other market participants within the WEIM Entity balancing authority areas, in their capacity as participants in WEIM. This scope excludes from joint authority, without limitation, any proposals to change or establish tariff rule(s) applicable only to the CAISO balancing authority area or to the CAISO-controlled grid.

Charter for WEIM Governance § 2.2.1. All of the tariff rule changes that require Board approval would be “applicable to EIM Entity balancing authority areas, EIM Entities, or other market participants within EIM Entity balancing authority areas, in their capacity as participants in EIM.” None of these proposed tariff rules would be applicable “only to the CAISO balancing authority area or to the CAISO-controlled grid.” Accordingly, the matters that require a vote of approval fall entirely within the scope of joint authority.

This proposed classification reflects the current state of this initiative. Stakeholders are encouraged to submit a response to this proposed classification in their written comments, particularly if they have concerns or questions.

A summary of the changes in the 2023 Cost-of-Service study is illustrated in the following Table 1.

Table 1 — Summary of Changes

Item	GMC Revenue Requirement		
	2024	2025	2026
Grid Management Charges			
GMC Cost Category Percentages	No Change	Changes	
Market Services		49%	
System Operations	49%	Charge Retired	
NEW: System Operations Real-Time Dispatch		23%	
New: System Operations Balance Authority Area Services		26%	
CRR Services		2%	
Western Energy Imbalance Market			
WEIM Percentage Allocations		Changes	
Real-Time Market	from 63% to 65%	from 65% to 64%	
Real-Time Dispatch	from 50% to 42%	Charge Retired	
Reliability Coordinator West			
		Change	
Reliability Coordinator Funding Percentage		from 9% to 8%	
RC Minimum Charge		No Change	
HANA Administrative Fee		No Change	
HANA Setup Fee		No Change	
Supplemental Fees			
Other Revenue (offsets to the GMC Revenue Requirement)		No Change	
Miscellaneous Fees (collected as charges below the line)		Changes	
TOR Charge/MWh	from \$0.18 to \$0.32	from \$0.32 to \$0.33	
Extended Day-Ahead Market			
EDAM Systems Operations	No Change	Changes EIM-RTD and EDAM-SO charges will be replaced by the NEW SO-RTD charge.	
NEW: EDAM Transitional Ramp-In Model		EDAM Transitional Ramp-In (2025 thru 2028)	
GMC Revenue Requirement			
	No Change	Changes	
GMC Revenue Requirement Cap	\$202M	\$245M	\$250M

GMC Cost Category Percentages

The 2023 Cost-of-Service study results indicate no shift of resources (time or dollars) in the Market Services, System Operations, or the CRR Services cost categories percentages.

WEIM Cost Category Percentages

The study results indicate a slight shift of WEIM related resources. The study shows that 2% of the Market Services' resources shifted from the Day-Ahead Market functions to the Real-Time Market functions. The percentage shifts back by 1% in 2025 as a result of the reduction in Nodal Pricing Model and WEIM Administrative fees in 2025. While 8% of the System Operations' resources shifted from the Real-Time Dispatch functions to the Balancing Authority functions as a result of the revenue offsetting System Operations Real-Time Dispatch costs as well as a shift of resources to support Summer Readiness and Transmission Planning efforts.

Reliability Coordinator Funding Percentage

The study results indicate there is a reduction in the RC funding percentage to 8% due to an increase in resources supporting efforts in the other cost categories.

Supplemental Fees

The study results indicate resources to support TOR efforts have increased due to higher support costs and lower volumes. The TOR Charge will increase from \$0.18 per MWh to \$0.32 per MWh in 2024 and to \$0.33 per MWh in 2025. The revenue collected from the TOR Charge offsets the System Operations Real-Time Dispatch costs, which lowers the System Operations Real-Time Dispatch Charge. The CAISO does not propose changes to other supplemental fee amounts.

Changes from the Draft Proposal

The content of this draft final proposal is primarily same as the draft proposal. All percentage allocations and fee changes that resulted from the updated Cost-of-Service study remain the same. The draft final proposal does provide for additional information on the proposed EDAM transitional load ramp-in model as provided in response to stakeholder comments². In addition, the CAISO proposes to eliminate the tariff language in Appendix F - Rate Schedules, Schedule 1 - Grid Management Charge, Part E – System Operations Charge Exemption for

²Visit the CAISO website for additional information regarding the comments, available [here](#).

Certain Long-Term Power Supply Contracts as there are no longer any active power supply contracts that are eligible for the exemption.

Application of Activity Based Costing

The CAISO used activity based costing (ABC) for the first Cost-of-Service study to restructure the GMC rate design in 2011, which was vetted through a comprehensive stakeholder process. The design was approved by the CAISO Board of Governors and the Federal Energy Regulatory Commission (FERC) in 2011 and became effective on January 1, 2012.

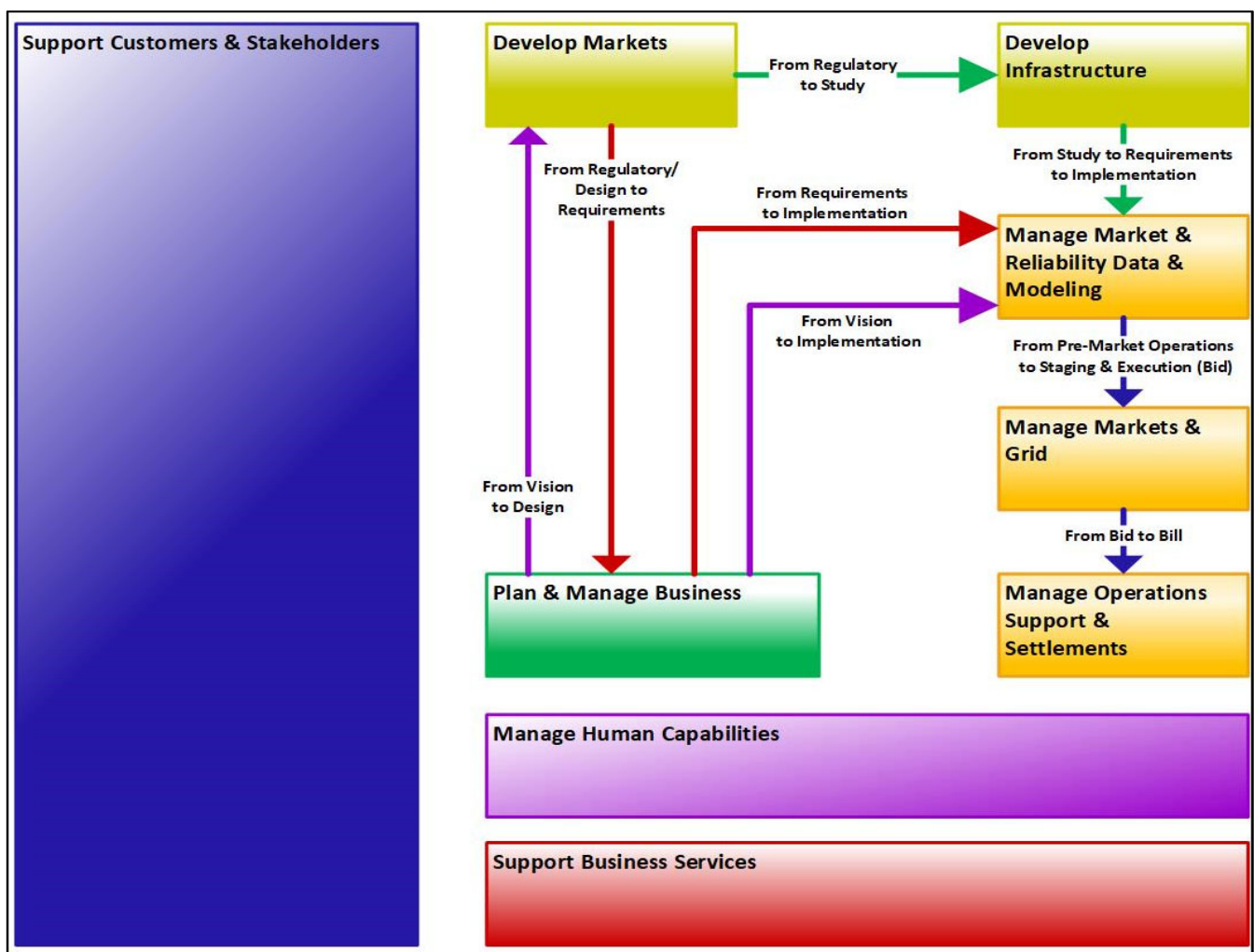
Activity based costing allows the CAISO to analyze the cost to provide services using budget, business processes, and time data. For the 2023 Cost-of-Service study the CAISO used the 2022 GMC Revenue Requirement and 2022 timecard data. The analysis provides a comprehensive understanding of how much effort (time and resources) are contributing to each of the service cost categories. This method guides the CAISO to allocate the right portion of its annual revenue requirement to the GMC and other rates.

The GMC rate structure contains three cost categories: Market Services, System Operations and CRR Services. The Market Services category is designed to recover costs the CAISO incurs for running the markets. The System Operations category is designed to recover costs the CAISO incurs for reliably operating the grid in real-time. The CRR Services category recovers costs the CAISO incurs for running the CRR markets. The CAISO uses the Cost-of-Service study to determine the share of the CAISO's direct and indirect costs attributable to these three cost categories. The CAISO applies the percentages calculated as part of the Cost-of-Service study to the annual GMC Revenue Requirement to determine the amount in the cost categories upon which rates are set.

Within the Market Services and System Operations cost categories, activity based costing also allows for the further delineation of resources to determine the appropriate percentage of GMC that WEIM entities pay. Market Services is bifurcated between Real-Time Market resources and Day-Ahead Market resources, while the System Operations is split between Real-Time Dispatch resources and Balancing Authority Services resources. WEIM entities pay the percentage of GMC associated with Real-Time Market and Real-Time Dispatch resources.

The Cost-of-Service study also includes the Reliability Coordinator cost sub-category to calculate the RC funding percentage. The RC funding percentage represents the direct and indirect time and expense necessary for the CAISO to perform its RC services and functions. The RC funding percentage is used similarly to the GMC cost category percentages as the RC funding percentage is multiplied against the revenue requirement to determine the RC Funding Requirement. This approach allows the RC Funding Requirement to leverage against the stability of CAISO's annual revenue requirement thus benefiting both RC customers and existing GMC customers.

Table 2 — Mapping of CAISO Core Business Processes



Currently, the ABC analysis has disaggregated CAISO functions into nine core processes (level 1 activities). Each of the core activities were further broken down into major processes (level 2 activities) which

were then mapped back to the level one activity. There are 112 level 2 activities included in the 2023 Cost-of-Service study.

The CAISO continually reviews and develops its processes to reflect its current state of operations and process flows. The level 2 processes discussed in this study were mapped and defined as of April 2023. The level 1 activities were categorized into two types: (1) direct operating costs — those that can be directly mapped to a market, grid service, customer, or reliability service; and (2) support or indirect costs — those that support the direct activity.

Table 3 — Level 1 ABC Activities

ABC Process Code	Level 1 ABC Activity	Number of Level 2 Activity Tasks
Direct Operating Costs		
80001	Develop Infrastructure	9
80002	Develop Markets	6
80004	Manage Market & Reliability Data & Modeling	17
80005	Manage Market & Grid	11
80007	Manage Operations Support & Settlements	11
80008	Plan & Manage Business	11
80009	Support Business Services	32
80010	Support Customers & Stakeholders	6
	Total	103
Indirect Operating Costs		
80003	Manage Human Capabilities	9
9	Total	112

MAPPING OF ABC DIRECT OPERATING ACTIVITIES

Direct operating activities were defined, linked to specific processes, and measured using the standard percentage allocations presented below.

**Table 4 —
Standard
Percentage
Allocations**

Standard Cost Category Percentage Allocations				
Scenario	Option 1	Option 2	Option 3	Option 4
1	100%			
2	95%	5%		
3	80%	20%		
4	80%	15%	5%	
5	80%	10%	5%	5%
6	60%	40%		
7	60%	35%	5%	
8	60%	30%	5%	5%
9	50%	50%		
10	50%	40%	10%	
11	45%	45%	5%	5%
12	40%	40%	20%	

Table 5 — Mapping of ABC Direct Operating Activities to Cost Categories

ABC Direct Operating Activities							
Code	ABC Level 2 Activities	GMC				Indirect	Comments
		Market Services	System Operations	CRR Services	Reliability Coordinator		
cost category % allocation							
80001 Develop Infrastructure (DI)							
201	Develop and Monitor Regulatory Contract Procedures	95%			5%		Efforts primarily support market services functions; as well as RC services functions on a smaller scale.
202	Manage Generator Interconnection Agreements		100%				Efforts related to managing the building and maintaining of the grid thus the costs are entirely to support system operations.
203	Manage Generator Interconnection Process		100%				Efforts related to managing the building and maintaining of the grid thus the costs are entirely to support system operations.
204	Manage Long Term Transmission Planning		100%				Efforts related to managing the building and maintaining of the grid thus the costs are entirely to support system operations.
205	Manage New Transmission Resources		95%		5%		Efforts primarily support system operations functions; as well as RC services functions on a smaller scale.
206	Manage Transmission Maintenance Standards		100%				Efforts related to managing the building and maintaining of the grid thus the costs are entirely to support system operations.
207	Manage Load Resource Data		100%				Efforts related to managing the building and maintaining of the grid thus the costs are entirely to support system operations.
208	Seasonal Assessment		100%				Efforts related to managing the building and maintaining of the grid thus the costs are entirely to support system operations.
209	Manage Queue Management		100%				Efforts related to managing the building and maintaining of the grid thus the costs are entirely to support system operations.
80002 Develop Markets (DM)							
226	Manage Regulatory Filings					100%	Attributes are not distinguishable to any specific category. Efforts predominately support system operations functions; as well as those of market services on a smaller scale.
229	Develop State / Federal Regulatory Policy	40%	60%				Efforts predominately support market services functions; as well as those of system operations, CRR services, and RC services on a smaller scale.
230	BPM Change Management	80%	10%	5%	5%		Efforts predominately support system operations functions; as well as those of market services on a smaller scale.
231	Develop Infrastructure Policy	40%	60%				Efforts predominately support market services functions; as well as those of system operations and RC services on a smaller scale.
232	Perform Market Analysis	80%	15%	5%			Efforts primarily support system operations functions and RC service functions on a smaller scale.
234	Manage Regulatory Contract Negotiations	95%			5%		
80004 Manage Market & Reliability Data & Modeling (MMR)							
301	Manage Full Network Model Maintenance	45%	45%	5%	5%		Efforts primarily support market services and system operations functions equally, as well as those of RC services and CRR services on a smaller scale.
302	Plan & Develop Operations Simulator Training		95%		5%		Efforts primarily support system operations functions; as well as RC services functions on a smaller scale.
304	EMAA Telemetry	50%	50%				Efforts support market services and system operations functions equally.
307	Manage Congestion Revenue Rights			100%			Efforts support CRR services functions entirely.
308	Manage Credit & Collateral	40%	40%	20%			Efforts primarily support market services and system operations functions equally, as well as those of CRR services on a smaller scale.
309	Resource Management	50%	50%				Efforts support market services and system operations functions equally.
310	Manage Reliability Requirements		100%				Efforts relate to actual system operations functions thus the costs are entirely to support system operations.
311	Manage Operations Planning		95%		5%		Efforts primarily support system operations functions; as well as RC services functions on a smaller scale.
312	Manage WECC Studies		100%				Efforts relate to actual system operations functions thus the costs are entirely to support system operations.
314	Manage & Facilitate Procedure Maintenance		95%		5%		Efforts primarily support system operations functions; as well as RC services functions on a smaller scale.
316	Plan & Develop Operations Training		95%		5%		Efforts primarily support system operations functions; as well as RC services functions on a smaller scale.
317	Execute & Track Operations Training		95%		5%		Efforts primarily support system operations functions; as well as RC services functions on a smaller scale.
320	Provide Stakeholder Training	60%	30%	5%	5%		Efforts support all category functions; primarily those of market services and system operations.
321	Schedule Coordinator Management	45%	45%	5%	5%		Efforts primarily support market services and system operations functions equally; as well as those of RC services and CRR services on a smaller scale.
322	Register, Modify and Terminate PDR Resource	100%					Efforts are entirely to support the market results and function.
323	Calculate & Monitor Energy Costs & Indices	60%	35%		5%		Efforts primarily support market services and system operations functions; as well as RC services on a smaller scale.
331	Operational Requirements	60%	40%				Efforts support weekly validation of Flex Requirement and daily Regulation Requirement, data validation and analysis, reporting, Tariff control process development, testing and customer support.

ABC Direct Operating Activities							
Code	ABC Level 2 Activities	GMC			Reliability Coordinator	Indirect	Comments
		Market Services	System Operations	CRR Services			
cost category % allocation							
80005 Manage Market & Grid (MMG)							
352	Manage Day-Ahead Market Support	95%			5%	Efforts primarily support market service functions; as well as RC services functions on a smaller scale.	
353	Operations Real-Time Support	80%	15%		5%	Efforts predominately support market service functions; as well as those of system operations and RC services functions on a smaller scale.	
355	Outage Model & Management	5%	60%		35%	Efforts predominately support system operations functions; as well as those of RC services and market services on a smaller scale.	
360	Real-Time Operations	20%	80%			Efforts predominately support system operations functions; as well as market services functions on a smaller scale.	
362	Manage Operations Engineering Support	15%	80%		5%	Efforts predominately support system operations functions; as well as those of market services and RC services functions on a smaller scale.	
367	Manage Operations Compliance & Event Analysis		50%		50%	Efforts support system operations and RC services functions equally.	
368	Manage Day-Ahead and Market Operations	100%				Efforts support market services functions entirely.	
370	Manage Real-Time Reliability Coordination				100%	Efforts support RC services functions entirely.	
371	Load Forecast	40%	50%		10%	Efforts support Day-Ahead and Real-Time operational forecast, vendor management, data validation, IT troubleshooting, and customer/market support.	
372	Renewable Forecast	50%	50%			Efforts support Eligible Intermittent Resource (EIR) onboarding/registration, configuration, modeling, data validation, Day-Ahead and Real Time operational forecast, vendor management, data validation and IT troubleshooting.	
373	Weather Forecast	40%	50%		10%	Efforts support renewables, provide recommendation, data quality and validation, variability assessment, temperature forecast, and summer/winter assessment.	
80007 Manage Operations Support & Settlements (MOS)							
401	Perform Market Validation	80%	20%			Efforts predominately support market services functions; as well as those of system operations functions on a smaller scale.	
402	Manage Dispute Analysis & Resolution	100%				Efforts are entirely to support the market services results and functions.	
403	Manage Market Quality System	50%	40%	10%		Efforts predominately support market services functions; as well as those of system operations and CRR services on a smaller scale.	
406	Manage Rules of Conduct				100%	Attributes are not distinguishable to any specific category.	
409	Meter Data Acquisition and Processing	100%				Attributes are not distinguishable to any specific category.	
411	Manage Market Clearing	45%	45%	5%	5%	Efforts support market services functions entirely.	
412	Manage Market Billing & Settlements	45%	45%	5%	5%	Efforts primarily support market services and system operations functions equally, as well as those of RC services and CRR services on a smaller scale.	
414	Manage Settlements Quarterly Release Cycle	45%	45%	5%	5%	Efforts primarily support market services and system operations functions equally, as well as those of RC services and CRR services on a smaller scale.	
417	Perform Market Report	80%	20%			Efforts predominately support market services functions; as well as those of system operations functions on a smaller scale.	
418	Manage Good Faith Negotiation Requests	100%				Efforts support market services functions entirely.	
419	Manage Price Corrections	50%	40%	10%		Efforts predominately support market services functions; as well as those of system operations and CRR services on a smaller scale.	
80008 Plan & Manage Business (PMB)							
451	Manage Financial Planning				100%	Attributes are not distinguishable to any specific category.	
452	Manage Application, Environment & Infrastructure				100%	Attributes are not distinguishable to any specific category.	
453	Manage Resource Allocation				100%	Attributes are not distinguishable to any specific category.	
454	Project Portfolio Management				100%	Attributes are not distinguishable to any specific category.	
455	Manage Technology Collaboration (Internal)	100%				Efforts support market services functions entirely.	
457	Manage Annual Functional Release Lifecycle				100%	Attributes are not distinguishable to any specific category.	
459	Enterprise Risk Management				100%	Attributes are not distinguishable to any specific category.	
461	Perform Board Processes				100%	Attributes are not distinguishable to any specific category.	
462	Manage Technology Collaboration (External)	100%				Efforts support market services functions entirely.	
466	Manage Corporate Goal Alignment and Reporting				100%	Attributes are not distinguishable to any specific category.	
469	Manage Project & Effort Lifecycles				100%	Attributes are not distinguishable to any specific category.	

ABC Direct Operating Activities							
Code	ABC Level 2 Activities	GMC			Reliability Coordinator	Indirect	Comments
		Market Services	System Operations	CRR Services			
cost category % allocation							
80009 Support Business Services (SBS)							
501	Manage Monthly Financial Cycle					100%	Attributes are not distinguishable to any specific category.
502	Invest Corporate Funds					100%	Attributes are not distinguishable to any specific category.
503	Manage Financial Reporting					100%	Attributes are not distinguishable to any specific category.
504	IT Application, System, & Non-Production Support	80%	15%		5%		Efforts predominately support market services functions; as well as those of system operations and RC services on a smaller scale.
505	IT Asset Management					100%	Attributes are not distinguishable to any specific category.
508	IT Configuration, Change & Release Management					100%	Attributes are not distinguishable to any specific category.
510	IT Event Management					100%	Attributes are not distinguishable to any specific category.
511	IT Incident Management	60%	30%	5%	5%		Efforts predominately support market services functions; as well as those of system operations, CRR services, and RC services on a smaller scale.
512	IT Information Security Management					100%	Attributes are not distinguishable to any specific category.
513	IT Problem & Risk Lifecycle Management	60%	30%	5%	5%		Efforts predominately support market services functions; as well as those of system operations, CRR services, and RC services on a smaller scale.
519	Provision and Manage Access					100%	Attributes are not distinguishable to any specific category.
520	Manage Facilities, Physical Security, & Safety					100%	Attributes are not distinguishable to any specific category.
521	Facilities Incident Management					100%	Attributes are not distinguishable to any specific category.
522	Corporate Incident Response & Disaster Recovery					100%	Attributes are not distinguishable to any specific category.
523	Manage Business Continuity Plan					100%	Attributes are not distinguishable to any specific category.
528	Procurement & Vendor Management					100%	Attributes are not distinguishable to any specific category.
529	Provide Legal Advice					100%	Attributes are not distinguishable to any specific category.
533	Manage Evidence Review / Audit					100%	Attributes are not distinguishable to any specific category.
535	Tariff Controls Monitoring					100%	Attributes are not distinguishable to any specific category.
536	Manage Internal Audit					100%	Attributes are not distinguishable to any specific category.
537	Monitor Markets	80%		20%			Efforts predominately support market services functions and CRR services functions on a smaller scale.
538	Manage Tariff Rules Violations					100%	Attributes are not distinguishable to any specific category.
543	Market Design					100%	Attributes are not distinguishable to any specific category.
544	Maintain DMM Database					100%	Attributes are not distinguishable to any specific category.
545	Manage Business Process & Continuous Improvement					100%	Attributes are not distinguishable to any specific category.
546	Records Management					100%	Attributes are not distinguishable to any specific category.
548	Manage Compliance Standards Development and Implementation					100%	Attributes are not distinguishable to any specific category.
549	Manage Compliance Investigations					100%	Attributes are not distinguishable to any specific category.
550	Manage NERC Compliance					100%	Attributes are not distinguishable to any specific category.
552	IT Reports & Documentation					100%	Attributes are not distinguishable to any specific category.
553	Manage Vulnerability Remediation					100%	Attributes are not distinguishable to any specific category.
555	Manage Root Cause Analysis					100%	Attributes are not distinguishable to any specific category.
80010 Support Customers & Stakeholders (SCS)							
539	Representing the ISO					100%	Attributes are not distinguishable to any specific category.
601	Manage Client Inquiries	80%	10%	5%	5%		Efforts predominately support market services functions; as well as those of system operations, CRR services, and RC services on a smaller scale.
602	Account Management	80%	10%	5%	5%		Efforts predominately support market services functions; as well as those of system operations, CRR services, and RC services on a smaller scale.
603	Manage Stakeholder Processes	80%	10%	5%	5%		Efforts predominately support market services functions; as well as those of system operations, CRR services, and RC services on a smaller scale.
609	Manage External Affairs					100%	Attributes are not distinguishable to any specific category.
610	Manage Communications & Public Relations					100%	Attributes are not distinguishable to any specific category.

MAPPING OF NON-ABC SUPPORT COSTS

For the next step, the CAISO pulled significant non-payroll ABC costs out of the operations and maintenance budget and allocated to buckets based on specific charge codes or to indirect costs.

Table 6 — Mapping of Non-ABC Support Costs to Cost Categories

Non-ABC Support Costs						
Component	GMC					Comments
	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect	
	cost category % allocation					
Non-ABC Support Costs						
Corporate Services						
Bank Fees					100%	Attributes are not distinguishable to any specific category.
HR Support					100%	Attributes are not distinguishable to any specific category.
Insurance					100%	Attributes are not distinguishable to any specific category.
WEIM Market Expert	100%					Cost supports Market Services (Real-Time Market).
SSAE 16 Audit	45%	45%	5%	5%		Use Process 80007, Task 412 allocations.
Operations Audit	22%	59%	0%	18%		Use Process 80005 total allocations.
Outside Legal					100%	Attributes are not distinguishable to any specific category.
Operational Services						
Hardware and Software Maintenance and Equipment					100%	Attributes are not distinguishable to any specific category.
Occupancy					100%	Attributes are not distinguishable to any specific category.
Telecommunications					100%	Attributes are not distinguishable to any specific category.
Intermittent Resource Forecasting Costs	80%	15%		5%		Use Process 80005, Task 353 allocations.
Market Surveillance Committee	80%	15%	5%			Use Process 80002, Task 232 allocations.
Reliability Coordinator Tools					100%	Use Process 80005, Task 370 allocations.

MAPPING OF ABC INDIRECT ACTIVITIES

ABC support activities were allocated to indirect costs.

Table 7 — Mapping of ABC Indirect Activities to Cost Categories

ABC Indirect Costs						
Component	GMC					Comments
	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect	
	cost category % allocation					
ABC Indirect Costs						
80003: Manage Human Capabilities (MHC)					100%	Attributes are not distinguishable to any specific category.

MAPPING OF DEBT SERVICE AND CASH FUNDED CAPITAL

Debt service is the aggregation of principle, interest, and a 25% debt service reserve on the 2021 bonds. The 2021 bonds refinanced bonds primarily associated with the financing of the CAISO's corporate headquarters in Folsom. The debt service was allocated 100 percent to indirect costs.

The revenue requirement also includes cash funded capital. The funds raised through the GMC contribute to maintaining a long-term capital reserve fund, which varies from the capital project budget for that year. The number of, and cost for, capital projects varies significantly from year to year. The annual budget identifies the approved capital spending limits but not the projects themselves. A proposed listing is provided to an internal management committee; which meets throughout the year to review and approve funding for specific projects. Because of the uncertainty of the actual projects coming on line, 100% of the cash funded capital was allocated to indirect costs.

Table 8 — Mapping of Debt Service and Capital to Cost Categories

Debt Service Bonds and Cash Funded Capital						
Component	GMC				Indirect	Comments
	Market Services	System Operations	CRR Services	Reliability Coordinator		
	<i>cost category % allocation</i>					
Debt Service Bonds					100%	Bonds used for Folsom location building and land. Attributes are not distinguishable to any specific category.
Cash Funded Capital					100%	Amounts and projects vary yearly thus attributes are not distinguishable to any specific category.

MAPPING OF OTHER REVENUE AND OPERATING COST RESERVE ADJUSTMENT

The remaining revenue requirement components, other revenue and operating cost reserve adjustment, were then analyzed and allocated to buckets based on specific charge codes or to indirect costs.

Table 9 — Mapping of Other Revenue to Cost Categories

Other Costs and Revenue						
Component	GMC					Comments
	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect	
<i>cost category % allocation</i>						
Other Costs and Revenue						
Energy Imbalance Market Administration Charges					100%	Attributes are not distinguishable to any specific category. Fee offsets Market Services' (Real-Time and Day-Ahead) costs and System Operations' (Real-Time) costs.
Nodal Pricing Model Fee	50%	50%				
Intermittent Resource Forecasting Fees	80%	15%		5%		Use Process 80005, Task 353 allocations.
Interest Earnings					100%	Attributes are not distinguishable to any specific category. Use Process 80001, Task 203 allocations.
Generator Interconnection Project Fees and Application Fees		100%				
HANA Administrative Fees*				100%		Use Process 80005, Task 370 allocations.
California-Oregon Intertie (COI) Path Operator Fees		100%				Fees offset System Operations' costs.
Metered Sub-Station Penalties					100%	Attributes are not distinguishable to any specific category.
SC Application Fees					100%	Attributes are not distinguishable to any specific category. Use Process 80001, Task 204 allocations.
Planning Coordinator Fees		100%				
CRR Application Fees					100%	
Reliability Coordinator Funding Requirement				100%		Use Process 80005, Task 370 allocations.

Table 10 — Mapping of Operating Cost Reserve Adjustment to Cost Categories

Operating Cost Reserve Adjustment						
Component	GMC					Comments
	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect	
<i>cost category % allocation</i>						
Operating Cost Reserve Adjustment						
Change in 15% Operating Cost Reserve					100%	
25% Debt Service Reserve for Bonds					100%	
2020 Revenue Budget to Actual Delta					100%	
2020 Expense Budget to Actual Delta					100%	Attributes are not distinguishable to any specific category.

MAPPING OF INDIRECT COSTS

Indirect costs were aggregated and then allocated proportionally to direct costs. After this mapping is completed it can be applied to the CAISO revenue requirement to derive the related Cost-of-Service.

Determining the costs of the 2022 GMC Revenue Requirement

The 2022 GMC Revenue Requirement data and employee hours are the most recent information available to determine the cost category percentage updates for the 2024 GMC tariff filing. The CAISO applied the allocation matrix of level 2 activities to the 2022 revenue requirement to determine the costs associated with the cost categories. To best represent projected revenue requirement needs in the next three-year cycle, modifications were made to the Operations and Maintenance budget to account for new positions added in 2023 and to account for projected inflationary growth in the budget going into 2026. Modifications were also made to the Other Costs and Revenue category to reflect the reduction in the Nodal Pricing Model fee and WEIM Administrative Charges after EDAM goes live in 2025; as well as the changes to the RC Funding Requirement as a result of modifications made in the revenue requirement. The Nodal Pricing Model (a gateway service to EDAM) is a service paid for by PacifiCorp and will no longer be collected once PacifiCorp joins EDAM in 2025. The WEIM Administrative Charges will decrease once WEIM participants become participants in EDAM, as transitioned WEIM participants will no longer pay WEIM Administrative Charges. The WEIM Administrative Charge will also decrease once the bifurcation of the System Operations Charge is implemented in 2025, as the System Operations Real-Time Dispatch Charge (previously identified as the WEIM System Operations Charge) will be collected as part of the GMC rather than as a supplemental revenue offset to the GMC Revenue Requirement. Additionally, modifications were made to the Operating Cost Reserve Adjustment category to represent a realistic adjustment under normal operations; the reserve adjustment credit of \$19.1 million included in the 2022 GMC Revenue Requirement was a result of budget surpluses driven by impacts of the pandemic that are not expected in future years.

Given the modifications made to the 2022 GMC Revenue Requirement to best represent the CAISO revenue requirement needs for the coming three-year cycle, the 2023 Cost-of-Service study analyzes the 2024 through 2026 revenue requirements under two scenarios. The first scenario assumes pre-Extended Day Ahead Market (EDAM) and impacts the analysis of the 2024 revenue requirement. The second scenario assumes EDAM and impacts the analysis of the 2025 and 2026 revenue requirements. The study will reference the first scenario's supporting calculations, for 2024, in the body of the paper. The second scenario's supporting calculations, for 2025 and 2026, will be included in Appendix A.

Table 11 — 2022 Modified GMC Revenue Requirement Components

Modified GMC Revenue Requirement (\$ in thousands)		
	Scenario 1	Scenario 2
Components	Modified Budget for 2024 Operations	Modified Budget for 2025 + 2026 Operations
Operations and Maintenance	\$ 258,422	\$ 258,422
Debt Service	\$ 14,685	\$ 14,686
Cash Funded Capital	\$ 15,000	\$ 15,000
Other Costs and Revenues	\$ (54,680)	\$ (39,930)
Operating Costs Reserve Adjustment	\$ (13,493)	\$ (5,468)
Total	\$ 219,934	\$ 242,710

Completing the analysis required the following steps:

1. Breaking out non-ABC operations and maintenance (O&M) support costs and applying cost category percentages to these costs;
2. Allocating the ABC direct and indirect O&M costs into two components: level 2 activities and support costs. This process involved:
 - a. Allocating cost centers to level 1 ABC activities
 - b. Applying cost category percentages to level 1 support costs
 - c. Obtaining time estimates for level 2 activities for those level 1 activities that are direct operating costs
 - d. Allocating costs to level 2 activities
 - e. Applying cost category percentages;
3. Allocating remaining revenue requirement components to cost categories and applying cost category percentages to these costs;
4. Aggregating costs and allocating indirect costs to cost categories based on percentage of direct costs, allocating fees to the cost category buckets and determining resulting cost category percentages; and

- Dividing resulting costs by estimated volumes to determine 2022 rates using revised cost category percentages.

Step 1: Breaking Out Non-ABC Support Costs

There are two types of O&M costs; those that are activity related such as costs attributed to personnel (ABC Activity Costs) and non-ABC costs such as facilities costs (Non-ABC Activity Costs).

Table 12 — Allocation of Costs to ABC Activities and Non-ABC Activities

Operations and Maintenance Budget (\$ in thousands)			
Division	ABC Activity Costs	Non-ABC Activity Costs	Total
Corporate Services	\$ 55,869	\$ 9,414	\$ 65,283
Operational Services	\$ 163,510	\$ 29,629	\$ 193,139
Total	\$ 219,379	\$ 39,043	\$ 258,422

The significant non-ABC support costs were removed from the divisions and allocated separately. These budgeted costs were allocated using the percentages shown in *Table 6 — Mapping of Non-ABC Support Costs to Cost Categories*.

Table 13 — Allocation of Non-ABC Support Costs to Cost Categories

Non-ABC Support Costs											
Component	GMC					Budget	GMC				
	Market	System	CRR	Reliability			Market	System	CRR	Reliability	
	Services	Operations	Services	Coordinator	Indirect		Services	Operations	Services	Coordinator	Indirect
	<i>cost category % allocation</i>						<i>budget allocations (amounts in thousands)</i>				
Non-ABC Support Costs											
Corporate Services											
Bank Fees					100%	\$ 435	\$ -	\$ -	\$ -	\$ -	\$ 435
HR Support					100%	\$ 2,954	\$ -	\$ -	\$ -	\$ -	\$ 2,954
Insurance					100%	\$ 2,871	\$ -	\$ -	\$ -	\$ -	\$ 2,871
WEIM Market Expert	100%					\$ 248	\$ 248	\$ -	\$ -	\$ -	\$ -
SSAE 16 Audit	45%	45%	5%	5%		\$ 641	\$ 289	\$ 288	\$ 32	\$ 32	\$ -
Operations Audit	22%	59%	0%	18%		\$ 126	\$ 28	\$ 75	\$ -	\$ 23	\$ -
Outside Legal					100%	\$ 2,139	\$ -	\$ -	\$ -	\$ -	\$ 2,139
Corporate Services Total						\$ 9,414	\$ 565	\$ 363	\$ 32	\$ 55	\$ 8,399
Operational Services											
Hardware and Software Maintenance and Equipment					100%	\$ 15,889	\$ -	\$ -	\$ -	\$ -	\$ 15,889
Occupancy					100%	\$ 5,806	\$ -	\$ -	\$ -	\$ -	\$ 5,806
Telecommunications					100%	\$ 4,547	\$ -	\$ -	\$ -	\$ -	\$ 4,547
Intermittent Resource Forecasting Costs	80%	15%		5%		\$ 1,519	\$ 1,215	\$ 228	\$ -	\$ 76	\$ -
Market Surveillance Committee	80%	15%	5%			\$ 354	\$ 283	\$ 53	\$ 18	\$ -	\$ -
Reliability Coordinator Tools				100%		\$ 1,514	\$ -	\$ -	\$ -	\$ 1,514	\$ -
Operational Services Total						\$ 29,629	\$ 1,498	\$ 281	\$ 18	\$ 1,590	\$ 26,242
Total Non-ABC Support Costs						\$ 39,043	\$ 2,063	\$ 644	\$ 50	\$ 1,645	\$ 34,641

Step 2: Allocation of O&M Costs

For activity related O&M costs, the current ABC structure was utilized to allocate costs between the cost categories. CAISO activities were broken out into nine level 1 ABC activities as shown in *Table 3 — Level 1 ABC Activities*. For the direct operating level 1 activities, the associated level 2 activities were mapped to one of the three cost categories as shown in *Table 5 — Mapping of ABC Direct Operating Activities to Cost Categories*. The level 1 support activities were allocated to ABC support costs.

The O&M budget covers expenses for 11 divisions and 124 cost centers. The CAISO divisions represent two high-level functions in the organization – Corporate Services and Operational Services. This section will present the O&M budget broken into those functions.

The divisions that contribute to the Corporate Services functions include the office of the Chief Executive Officer, the Finance division, the Human Resources division, the General Counsel division, the External Affairs division, and the Stakeholder Engagement and Customer Experience division. The functions also include the Enterprise Program Management Office and the Market Monitoring department.

The divisions that contribute to the Operational Services functions include the office of the Chief Operating Officer division, the Infrastructure and Operations Planning division, the Power Systems Market Technology division, the System Operations division, and the Market Design and Analysis division. The functions also include the Enterprise Systems and Campus Operations department and the Project Management department.

The reported 2022 time card data was collected and the percentage breakdown of each cost center by the level one and level 2 direct activities was determined. The percentage was applied to the activity budget for the cost center to allocate the cost center activity budget by dollars to the level one and level 2 direct operating activities.

ABC DIRECT OPERATING ACTIVITIES

Table 14 — Allocation of Function Hours to Direct Operating Activities

ABC Process Code	Level 1 ABC Activity	Allocation of Hours By Function		
		Corporate Services	Operational Services	Total
Direct Operating Costs				
80001	Develop Infrastructure	4%	96%	100%
80002	Develop Markets	5%	95%	100%
80004	Manage Market & Reliability Data & Modeling	12%	88%	100%
80005	Manage Market & Grid	0%	100%	100%
80007	Manage Operations Support & Settlements	3%	97%	100%
80008	Plan & Manage Business	24%	76%	100%
80009	Support Business Services	28%	72%	100%
80010	Support Customers & Stakeholders	88%	12%	100%
	Total	19%	81%	100%

The hours were then aggregated by level 2 activity.

Table 15 — Allocation of Function Hours to Level 2 Activities

ABC Direct Operating Activities		Allocation of Hours By Function		
Code	ABC Level 2 Activities	Corporate Services	Operational Services	Total
80001 Develop Infrastructure (DI)				
201	Develop and Monitor Regulatory Contract Procedures	0%	100%	100%
202	Manage Generator Interconnection Agreements	0%	100%	100%
203	Manage Generator Interconnection Process	14%	86%	100%
204	Manage Long Term Transmission Planning	0%	100%	100%
205	Manage New Transmission Resources	0%	100%	100%
206	Manage Transmission Maintenance Standards	0%	100%	100%
207	Manage Load Resource Data	0%	100%	100%
208	Seasonal Assessment	0%	100%	100%
209	Manage Queue Management	0%	100%	100%
	Total DI	4%	96%	100%
80002 Develop Markets (DM)				
226	Manage Regulatory Filings	100%	0%	100%
229	Develop State / Federal Regulatory Policy	0%	100%	100%
230	BPM Change Management	100%	0%	100%
231	Develop Infrastructure Policy	0%	100%	100%
232	Perform Market Analysis	0%	100%	100%
234	Manage Regulatory Contract Negotiations	0%	100%	100%
	Total DM	5%	95%	100%

ABC Direct Operating Activities		Allocation of Hours By Function		
Code	ABC Level 2 Activities	Corporate Services	Operational Services	Total
80004 Manage Market & Reliability Data & Modeling (MMR)				
301	Manage Full Network Model Maintenance	0%	100%	100%
302	Plan & Develop Operations Simulator Training	0%	100%	100%
304	EMAA Telemetry	0%	100%	100%
307	Manage Congestion Revenue Rights	0%	100%	100%
308	Manage Credit & Collateral	100%	0%	100%
309	Resource Management	0%	100%	100%
310	Manage Reliability Requirements	0%	100%	100%
311	Manage Operations Planning	0%	100%	100%
312	Manage WECC Studies	0%	100%	100%
314	Manage & Facilitate Procedure Maintenance	0%	100%	100%
316	Plan & Develop Operations Training	0%	100%	100%
317	Execute & Track Operations Training	0%	100%	100%
320	Provide Stakeholder Training	98%	2%	100%
321	Schedule Coordinator Management	100%	0%	100%
322	Register, Modify and Terminate PDR Resource	0%	100%	100%
323	Calculate & Monitor Energy Costs & Indices	7%	93%	100%
331	Operational Requirements	0%	100%	100%
Total MMR		12%	88%	100%

ABC Direct Operating Activities		Allocation of Hours By Function		
Code	ABC Level 2 Activities	Corporate Services	Operational Services	Total
80005 Manage Market & Grid (MMG)				
352	Manage Day-Ahead Market Support	0%	100%	100%
353	Operations Real-Time Support	0%	100%	100%
355	Outage Model & Management	0%	100%	100%
360	Real-Time Operations	1%	99%	100%
362	Manage Operations Engineering Support	0%	100%	100%
367	Manage Operations Compliance & Event Analysis	0%	100%	100%
368	Manage Day-Ahead and Market Operations	0%	100%	100%
370	Manage Real-Time Reliability Coordination	0%	100%	100%
371	Load Forecast	0%	100%	100%
372	Renewable Forecast	0%	100%	100%
373	Weather Forecast	0%	100%	100%
Total MMG		0%	100%	100%

ABC Direct Operating Activities		Allocation of Hours By Function		
Code	ABC Level 2 Activities	Corporate Services	Operational Services	Total
80007 Manage Operations Support & Settlements (MOS)				
401	Perform Market Validation	0%	100%	100%
402	Manage Dispute Analysis & Resolution	0%	100%	100%
403	Manage Market Quality System	0%	100%	100%
406	Manage Rules of Conduct	0%	100%	100%
409	Meter Data Acquisition and Processing	0%	100%	100%
411	Manage Market Clearing	97%	3%	100%
412	Manage Market Billing & Settlements	0%	100%	100%
414	Manage Settlements Quarterly Release Cycle	1%	99%	100%
417	Perform Market Report	0%	100%	100%
418	Manage Good Faith Negotiation Requests	100%	0%	100%
419	Manage Price Corrections	0%	100%	100%
Total MOS		3%	97%	100%
80008 Plan & Manage Business (PMB)				
451	Manage Financial Planning	99%	1%	100%
452	Manage Application, Environment & Infrastructure	0%	100%	100%
453	Manage Resource Allocation	21%	79%	100%
454	Project Portfolio Management	18%	82%	100%
455	Manage Technology Collaboration (Internal)	0%	100%	100%
457	Manage Annual Functional Release Lifecycle	0%	100%	100%
459	Enterprise Risk Management	95%	5%	100%
461	Perform Board Processes	96%	4%	100%
462	Manage Technology Collaboration (External)	0%	100%	100%
466	Manage Corporate Goal Alignment and Reporting	91%	9%	100%
469	Manage Project & Effort Lifecycles	34%	66%	100%
Total PMB		24%	76%	100%

ABC Direct Operating Activities		Allocation of Hours By Function		
Code	ABC Level 2 Activities	Corporate Services	Operational Services	Total
80009	Support Business Services (SBS)			
501	Manage Monthly Financial Cycle	100%	0%	100%
502	Invest Corporate Funds	100%	0%	100%
503	Manage Financial Reporting	100%	0%	100%
504	IT Application, System, & Non-Production Support	0%	100%	100%
505	IT Asset Management	0%	100%	100%
508	IT Configuration, Change & Release Management	2%	98%	100%
510	IT Event Management	0%	100%	100%
511	IT Incident Management	0%	100%	100%
512	IT Information Security Management	0%	100%	100%
513	IT Problem & Risk Lifecycle Management	0%	100%	100%
519	Provision and Manage Access	0%	100%	100%
520	Manage Facilities, Physical Security, & Safety	0%	100%	100%
521	Facilities Incident Management	0%	100%	100%
522	Corporate Incident Response & Disaster Recovery	16%	84%	100%
523	Manage Business Continuity Plan	3%	97%	100%
528	Procurement & Vendor Management	99%	1%	100%
529	Provide Legal Advice	100%	0%	100%
533	Manage Evidence Review / Audit	0%	100%	100%
535	Tariff Controls Monitoring	100%	0%	100%
536	Manage Internal Audit	91%	9%	100%
537	Monitor Markets	100%	0%	100%
538	Manage Tariff Rules Violations	100%	0%	100%
543	Market Design	95%	5%	100%
544	Maintain DMM Database	100%	0%	100%
545	Manage Business Process & Continuous Improvement	66%	34%	100%
546	Records Management	93%	7%	100%
548	Manage Compliance Standards Development and Implementation	18%	82%	100%
549	Manage Compliance Investigations	56%	44%	100%
550	Manage NERC Compliance	50%	50%	100%
552	IT Reports & Documentation	0%	100%	100%
555	Manage Root Cause Analysis	0%	100%	100%
Total SBS		28%	72%	100%

ABC Direct Operating Activities		Allocation of Hours By Function		
Code	ABC Level 2 Activities	Corporate Services	Operational Services	Total
80010	Support Customers & Stakeholders (SCS)			
539	Representing the ISO	0%	100%	100%
601	Manage Client Inquiries	97%	3%	100%
602	Account Management	100%	0%	100%
603	Manage Stakeholder Processes	97%	3%	100%
609	Manage External Affairs	72%	28%	100%
610	Manage Communications & Public Relations	100%	0%	100%
	Total SCS	88%	12%	100%

DIRECT OPERATING ACTIVITIES

The direct operating activities costs were factored into the allocation matrix shown in *Table 5 — Mapping of ABC Direct Operating Activities to Cost Categories* — to get the costs to the cost categories.

Table 16 — Allocation of Function Costs to Direct Operating Activities

ABC Process Code	Level 1 ABC Activity	Allocation of Costs By Function (\$ in thousands)		
		Corporate Services	Operational Services	Total
Direct Operating Costs				
80001	Develop Infrastructure	\$ 567	\$ 13,459	\$ 14,026
80002	Develop Markets	\$ 975	\$ 17,752	\$ 18,727
80004	Manage Market & Reliability Data & Modeling	\$ 3,421	\$ 17,587	\$ 21,008
80005	Manage Market & Grid	\$ 50	\$ 42,239	\$ 42,289
80007	Manage Operations Support & Settlements	\$ 208	\$ 9,676	\$ 9,884
80008	Plan & Manage Business	\$ 9,021	\$ 20,868	\$ 29,889
80009	Support Business Services	\$ 20,015	\$ 37,872	\$ 57,887
80010	Support Customers & Stakeholders	\$ 14,648	\$ 3,964	\$ 18,612
	Total	\$ 48,905	\$ 163,417	\$ 212,322

The costs were then aggregated by level 2 activity.

Table 17 — Allocation of Function Costs to Level 2 Activity

ABC Direct Operating Activities		Allocation of Costs By Function			
Code	ABC Level 2 Activities	Corporate Services	Operational Services	Total	
<i>budget allocations (amounts in thousands)</i>					
80001 Develop Infrastructure (DI)					
201	Develop and Monitor Regulatory Contract Procedures	\$ -	\$ 1,237	\$	1,237
202	Manage Generator Interconnection Agreements	\$ -	\$ 419	\$	419
203	Manage Generator Interconnection Process	\$ 567	\$ 3,623	\$	4,190
204	Manage Long Term Transmission Planning	\$ -	\$ 5,985	\$	5,985
205	Manage New Transmission Resources	\$ -	\$ 693	\$	693
206	Manage Transmission Maintenance Standards	\$ -	\$ 328	\$	328
207	Manage Load Resource Data	\$ -	\$ 308	\$	308
208	Seasonal Assessment	\$ -	\$ 261	\$	261
209	Manage Queue Management	\$ -	\$ 605	\$	605
	Total DI	\$ 567	\$ 13,459	\$	14,026
80002 Develop Markets (DM)					
226	Manage Regulatory Filings	\$ 941	\$ -	\$	941
229	Develop State / Federal Regulatory Policy	\$ -	\$ 275	\$	275
230	BPM Change Management	\$ 34	\$ -	\$	34
231	Develop Infrastructure Policy	\$ -	\$ 13,227	\$	13,227
232	Perform Market Analysis	\$ -	\$ 3,766	\$	3,766
234	Manage Regulatory Contract Negotiations	\$ -	\$ 484	\$	484
	Total DM	\$ 975	\$ 17,752	\$	18,727

ABC Direct Operating Activities		Allocation of Costs By Function		
Code	ABC Level 2 Activities	Corporate Services	Operational Services	Total
<i>budget allocations (amounts in thousands)</i>				
80004 Manage Market & Reliability Data & Modeling (MMR)				
301	Manage Full Network Model Maintenance	\$ -	\$ 5,498	\$ 5,498
302	Plan & Develop Operations Simulator Training	\$ -	\$ 385	\$ 385
304	EMAA Telemetry	\$ -	\$ 1,022	\$ 1,022
307	Manage Congestion Revenue Rights	\$ -	\$ 665	\$ 665
308	Manage Credit & Collateral	\$ 1,459	\$ -	\$ 1,459
309	Resource Management	\$ -	\$ 1,667	\$ 1,667
310	Manage Reliability Requirements	\$ -	\$ 1,098	\$ 1,098
311	Manage Operations Planning	\$ -	\$ 1,786	\$ 1,786
312	Manage WECC Studies	\$ -	\$ 130	\$ 130
314	Manage & Facilitate Procedure Maintenance	\$ -	\$ 238	\$ 238
316	Plan & Develop Operations Training	\$ -	\$ 2,793	\$ 2,793
317	Execute & Track Operations Training	\$ -	\$ 1,254	\$ 1,254
320	Provide Stakeholder Training	\$ 1,471	\$ 24	\$ 1,495
321	Schedule Coordinator Management	\$ 358	\$ -	\$ 358
322	Register, Modify and Terminate PDR Resource	\$ -	\$ 56	\$ 56
323	Calculate & Monitor Energy Costs & Indices	\$ 133	\$ 778	\$ 911
331	Operational Requirements	\$ -	\$ 193	\$ 193
Total MMR		\$ 3,421	\$ 17,587	\$ 21,008

ABC Direct Operating Activities		Allocation of Costs By Function			
Code	ABC Level 2 Activities	Corporate Services	Operational Services	Total	
<i>budget allocations (amounts in thousands)</i>					
80005	Manage Market & Grid (MMG)				
352	Manage Day-Ahead Market Support	\$ -	\$ 369	\$	369
353	Operations Real-Time Support	\$ -	\$ 847	\$	847
355	Outage Model & Management	\$ -	\$ 3,817	\$	3,817
360	Real-Time Operations	\$ 50	\$ 21,795	\$	21,845
362	Manage Operations Engineering Support	\$ -	\$ 5,201	\$	5,201
367	Manage Operations Compliance & Event Analysis	\$ -	\$ 643	\$	643
368	Manage Day-Ahead and Market Operations	\$ -	\$ 2,029	\$	2,029
370	Manage Real-Time Reliability Coordination	\$ -	\$ 5,350	\$	5,350
371	Load Forecast	\$ -	\$ 1,466	\$	1,466
372	Renewable Forecast	\$ -	\$ 563	\$	563
373	Weather Forecast	\$ -	\$ 159	\$	159
	Total MMG	\$ 50	\$ 42,239	\$	42,289

ABC Direct Operating Activities		Allocation of Costs By Function			
Code	ABC Level 2 Activities	Corporate Services	Operational Services	Total	
<i>budget allocations (amounts in thousands)</i>					
80007 Manage Operations Support & Settlements (MOS)					
401	Perform Market Validation	\$ -	\$ 283	\$	283
402	Manage Dispute Analysis & Resolution	\$ -	\$ 1,437	\$	1,437
403	Manage Market Quality System	\$ -	\$ 617	\$	617
406	Manage Rules of Conduct	\$ -	\$ 48	\$	48
409	Meter Data Acquisition and Processing	\$ -	\$ 287	\$	287
411	Manage Market Clearing	\$ 162	\$ 5	\$	167
412	Manage Market Billing & Settlements	\$ -	\$ 2,205	\$	2,205
414	Manage Settlements Quarterly Release Cycle	\$ 29	\$ 2,639	\$	2,668
417	Perform Market Report	\$ -	\$ 560	\$	560
418	Manage Good Faith Negotiation Requests	\$ 17	\$ -	\$	17
419	Manage Price Corrections	\$ -	\$ 1,595	\$	1,595
	Total MOS	\$ 208	\$ 9,676	\$	9,884
80008 Plan & Manage Business (PMB)					
451	Manage Financial Planning	\$ 1,121	\$ 5	\$	1,126
452	Manage Application, Environment & Infrastructure	\$ -	\$ 2,252	\$	2,252
453	Manage Resource Allocation	\$ 36	\$ 77	\$	113
454	Project Portfolio Management	\$ 1,009	\$ 2,713	\$	3,722
455	Manage Technology Collaboration (Internal)	\$ 4	\$ 9,559	\$	9,563
457	Manage Annual Functional Release Lifecycle	\$ -	\$ 173	\$	173
459	Enterprise Risk Management	\$ 149	\$ 6	\$	155
461	Perform Board Processes	\$ 1,728	\$ 268	\$	1,996
462	Manage Technology Collaboration (External)	\$ -	\$ 427	\$	427
466	Manage Corporate Goal Alignment and Reporting	\$ 1,096	\$ 40	\$	1,136
469	Manage Project & Effort Lifecycles	\$ 3,878	\$ 5,348	\$	9,226
	Total PMB	\$ 9,021	\$ 20,868	\$	29,889

ABC Direct Operating Activities		Allocation of Costs By Function		
Code	ABC Level 2 Activities	Corporate Services	Operational Services	Total
<i>budget allocations (amounts in thousands)</i>				
80009	Support Business Services (SBS)			
501	Manage Monthly Financial Cycle	\$ 749	\$ -	\$ 749
502	Invest Corporate Funds	\$ 450	\$ -	\$ 450
503	Manage Financial Reporting	\$ 553	\$ -	\$ 553
504	IT Application, System, & Non-Production Support	\$ -	\$ 18,437	\$ 18,437
505	IT Asset Management	\$ -	\$ 787	\$ 787
508	IT Configuration, Change & Release Management	\$ 20	\$ 1,356	\$ 1,376
510	IT Event Management	\$ -	\$ 934	\$ 934
511	IT Incident Management	\$ 9	\$ 5,812	\$ 5,821
512	IT Information Security Management	\$ 20	\$ 1,337	\$ 1,357
513	IT Problem & Risk Lifecycle Management	\$ -	\$ 633	\$ 633
519	Provision and Manage Access	\$ -	\$ 197	\$ 197
520	Manage Facilities, Physical Security, & Safety	\$ -	\$ 2,775	\$ 2,775
521	Facilities Incident Management	\$ -	\$ 5	\$ 5
522	Corporate Incident Response & Disaster Recovery	\$ 35	\$ 163	\$ 198
523	Manage Business Continuity Plan	\$ 49	\$ 1,313	\$ 1,362
528	Procurement & Vendor Management	\$ 847	\$ 8	\$ 855
529	Provide Legal Advice	\$ 6,973	\$ -	\$ 6,973
533	Manage Evidence Review / Audit	\$ -	\$ 425	\$ 425
535	Tariff Controls Monitoring	\$ 1,120	\$ 3	\$ 1,123
536	Manage Internal Audit	\$ 2,029	\$ 180	\$ 2,209
537	Monitor Markets	\$ 3,635	\$ -	\$ 3,635
538	Manage Tariff Rules Violations	\$ 168	\$ -	\$ 168
543	Market Design	\$ 495	\$ 45	\$ 540
544	Maintain DMM Database	\$ 663	\$ -	\$ 663
545	Manage Business Process & Continuous Improvement	\$ 459	\$ 156	\$ 615
546	Records Management	\$ 470	\$ 20	\$ 490
548	Manage Compliance Standards Development and Implementation	\$ 8	\$ 49	\$ 57
549	Manage Compliance Investigations	\$ 139	\$ 194	\$ 333
550	Manage NERC Compliance	\$ 1,123	\$ 2,488	\$ 3,611
552	IT Reports & Documentation	\$ -	\$ 55	\$ 55
553	Manage Vulnerability Remediation	\$ -	\$ -	\$ -
555	Manage Root Cause Analysis	\$ 1	\$ 500	\$ 501
Total SBS		\$ 20,015	\$ 37,872	\$ 57,887

ABC Direct Operating Activities		Allocation of Costs By Function		
Code	ABC Level 2 Activities	Corporate Services	Operational Services	Total
<i>budget allocations (amounts in thousands)</i>				
80010	Support Customers & Stakeholders (SCS)			
539	Representing the ISO	\$ -	\$ 2,448	\$ 2,448
601	Manage Client Inquiries	\$ 3,675	\$ 82	\$ 3,757
602	Account Management	\$ 885	\$ -	\$ 885
603	Manage Stakeholder Processes	\$ 2,202	\$ 37	\$ 2,239
609	Manage External Affairs	\$ 5,294	\$ 1,397	\$ 6,691
610	Manage Communications & Public Relations	\$ 2,592	\$ -	\$ 2,592
	Total SCS	\$ 14,648	\$ 3,964	\$ 18,612
	Total Direct O&M	\$ 48,905	\$ 163,417	\$ 212,322

For direct operating activities the costs were aggregated at level 2 and allocated to the cost category identified in *Table 5 — Mapping of ABC Direct Operating Activities to Cost Categories*.

Table 18 — Allocation of ABC Direct Operating Activity Costs to Cost Categories

ABC Direct Operating Activities												
		GMC				GMC						
Code	ABC Level 2 Activities	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect	Budget	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect
<i>cost category % allocation</i>						<i>budget allocations (amounts in thousands)</i>						
80001 Develop Infrastructure (DI)												
201	Develop and Monitor Regulatory Contract Procedures	95%			5%		\$ 1,237	\$ 1,175	\$ -	\$ -	\$ 62	\$ -
202	Manage Generator Interconnection Agreements		100%				\$ 419	\$ -	\$ 419	\$ -	\$ -	\$ -
203	Manage Generator Interconnection Process		100%				\$ 4,190	\$ -	\$ 4,190	\$ -	\$ -	\$ -
204	Manage Long Term Transmission Planning		100%				\$ 5,985	\$ -	\$ 5,985	\$ -	\$ -	\$ -
205	Manage New Transmission Resources		95%		5%		\$ 693	\$ -	\$ 658	\$ -	\$ 35	\$ -
206	Manage Transmission Maintenance Standards		100%				\$ 328	\$ -	\$ 328	\$ -	\$ -	\$ -
207	Manage Load Resource Data		100%				\$ 308	\$ -	\$ 308	\$ -	\$ -	\$ -
208	Seasonal Assessment		100%				\$ 261	\$ -	\$ 261	\$ -	\$ -	\$ -
209	Manage Queue Management		100%				\$ 605	\$ -	\$ 605	\$ -	\$ -	\$ -
	Total DI						\$ 14,026	\$ 1,175	\$ 12,754	\$ -	\$ 97	\$ -
80002 Develop Markets (DM)												
226	Manage Regulatory Filings					100%	\$ 941	\$ -	\$ -	\$ -	\$ -	\$ 941
229	Develop State / Federal Regulatory Policy	40%	60%				\$ 275	\$ 110	\$ 165	\$ -	\$ -	\$ -
230	BPM Change Management	80%	10%	5%	5%		\$ 34	\$ 27	\$ 3	\$ 2	\$ 2	\$ -
231	Develop Infrastructure Policy	40%	60%				\$ 13,227	\$ 5,291	\$ 7,936	\$ -	\$ -	\$ -
232	Perform Market Analysis	80%	15%	5%			\$ 3,766	\$ 3,013	\$ 565	\$ 188	\$ -	\$ -
234	Manage Regulatory Contract Negotiations	95%			5%		\$ 484	\$ 460	\$ -	\$ -	\$ 24	\$ -
	Total DM						\$ 18,727	\$ 8,901	\$ 8,669	\$ 190	\$ 26	\$ 941

ABC Direct Operating Activities

		GMC				GMC						
Code	ABC Level 2 Activities	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect	Budget	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect
		<i>cost category % allocation</i>					<i>budget allocations (amounts in thousands)</i>					
80004 Manage Market & Reliability Data & Modeling (MMR)												
301	Manage Full Network Model Maintenance	45%	45%	5%	5%		\$ 5,498	\$ 2,474	\$ 2,474	\$ 275	\$ 275	\$ -
302	Plan & Develop Operations Simulator Training		95%		5%		\$ 385	\$ -	\$ 366	\$ -	\$ 19	\$ -
304	EMAA Telemetry	50%	50%				\$ 1,022	\$ 511	\$ 511	\$ -	\$ -	\$ -
307	Manage Congestion Revenue Rights			100%			\$ 665	\$ -	\$ -	\$ 665	\$ -	\$ -
308	Manage Credit & Collateral	40%	40%	20%			\$ 1,459	\$ 583	\$ 584	\$ 292	\$ -	\$ -
309	Resource Management	50%	50%				\$ 1,667	\$ 833	\$ 834	\$ -	\$ -	\$ -
310	Manage Reliability Requirements		100%				\$ 1,098	\$ -	\$ 1,098	\$ -	\$ -	\$ -
311	Manage Operations Planning		95%		5%		\$ 1,786	\$ -	\$ 1,697	\$ -	\$ 89	\$ -
312	Manage WECC Studies		100%				\$ 130	\$ -	\$ 130	\$ -	\$ -	\$ -
314	Manage & Facilitate Procedure Maintenance		95%		5%		\$ 238	\$ -	\$ 226	\$ -	\$ 12	\$ -
316	Plan & Develop Operations Training		95%		5%		\$ 2,793	\$ -	\$ 2,653	\$ -	\$ 140	\$ -
317	Execute & Track Operations Training		95%		5%		\$ 1,254	\$ -	\$ 1,191	\$ -	\$ 63	\$ -
320	Provide Stakeholder Training	60%	30%	5%	5%		\$ 1,495	\$ 896	\$ 449	\$ 75	\$ 75	\$ -
321	Schedule Coordinator Management	45%	45%	5%	5%		\$ 358	\$ 161	\$ 161	\$ 18	\$ 18	\$ -
322	Register, Modify and Terminate PDR Resource	100%					\$ 56	\$ 56	\$ -	\$ -	\$ -	\$ -
323	Calculate & Monitor Energy Costs & Indices	60%	35%		5%		\$ 911	\$ 546	\$ 319	\$ -	\$ 46	\$ -
331	Operational Requirements	60%	40%				\$ 193	\$ 116	\$ 77	\$ -	\$ -	\$ -
Total MMR							\$ 21,008	\$ 6,176	\$ 12,770	\$ 1,325	\$ 737	\$ -

ABC Direct Operating Activities							GMC				GMC			
Code	ABC Level 2 Activities	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect	Budget	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect		
		<i>cost category % allocation</i>					<i>budget allocations (amounts in thousands)</i>							
80005 Manage Market & Grid (MMG)														
352	Manage Day-Ahead Market Support	95%			5%		\$ 369	\$ 351	\$ -	\$ -	\$ 18	\$ -		
353	Operations Real-Time Support	80%	15%		5%		\$ 847	\$ 678	\$ 127	\$ -	\$ 42	\$ -		
355	Outage Model & Management	5%	60%		35%		\$ 3,817	\$ 191	\$ 2,290	\$ -	\$ 1,336	\$ -		
360	Real-Time Operations	20%	80%				\$ 21,845	\$ 4,369	\$ 17,476	\$ -	\$ -	\$ -		
362	Manage Operations Engineering Support	15%	80%		5%		\$ 5,201	\$ 780	\$ 4,161	\$ -	\$ 260	\$ -		
367	Manage Operations Compliance & Event Analysis		50%		50%		\$ 643	\$ -	\$ 321	\$ -	\$ 322	\$ -		
368	Manage Day-Ahead and Market Operations	100%					\$ 2,029	\$ 2,029	\$ -	\$ -	\$ -	\$ -		
370	Manage Real-Time Reliability Coordination				100%		\$ 5,350	\$ -	\$ -	\$ -	\$ 5,350	\$ -		
371	Load Forecast	40%	50%		10%		\$ 1,466	\$ 586	\$ 733	\$ -	\$ 147	\$ -		
372	Renewable Forecast	50%	50%				\$ 563	\$ 281	\$ 282	\$ -	\$ -	\$ -		
373	Weather Forecast	40%	50%		10%		\$ 159	\$ 64	\$ 79	\$ -	\$ 16	\$ -		
	Total MMG						\$ 42,289	\$ 9,329	\$ 25,469	\$ -	\$ 7,491	\$ -		
	MMG %s						100%	22%	59%	0%	18%	0%		

ABC Direct Operating Activities						GMC					GMC						
Code	ABC Level 2 Activities	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect	Budget	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect					
		<i>cost category % allocation</i>					<i>budget allocations (amounts in thousands)</i>										
80007 Manage Operations Support & Settlements (MOS)																	
401	Perform Market Validation	80%	20%				\$ 283	\$ 226	\$ 57	\$ -	\$ -	\$ -					
402	Manage Dispute Analysis & Resolution	100%					\$ 1,437	\$ 1,437	\$ -	\$ -	\$ -	\$ -					
403	Manage Market Quality System	50%	40%	10%			\$ 617	\$ 308	\$ 247	\$ 62	\$ -	\$ -					
406	Manage Rules of Conduct					100%	\$ 48	\$ -	\$ -	\$ -	\$ -	\$ -					48
409	Meter Data Acquisition and Processing	100%					\$ 287	\$ 287	\$ -	\$ -	\$ -	\$ -					
411	Manage Market Clearing	45%	45%	5%	5%		\$ 167	\$ 76	\$ 75	\$ 8	\$ 8	\$ -					
412	Manage Market Billing & Settlements	45%	45%	5%	5%		\$ 2,205	\$ 993	\$ 992	\$ 110	\$ 110	\$ -					
414	Manage Settlements Quarterly Release Cycle	45%	45%	5%	5%		\$ 2,668	\$ 1,201	\$ 1,201	\$ 133	\$ 133	\$ -					
417	Perform Market Report	80%	20%				\$ 560	\$ 448	\$ 112	\$ -	\$ -	\$ -					
418	Manage Good Faith Negotiation Requests	100%					\$ 17	\$ 17	\$ -	\$ -	\$ -	\$ -					
419	Manage Price Corrections	50%	40%	10%			\$ 1,595	\$ 797	\$ 638	\$ 160	\$ -	\$ -					
	Total MOS						\$ 9,884	\$ 5,790	\$ 3,322	\$ 473	\$ 251	\$ 48					
80008 Plan & Manage Business (PMB)																	
451	Manage Financial Planning					100%	\$ 1,126	\$ -	\$ -	\$ -	\$ -	\$ -					1,126
452	Manage Application, Environment & Infrastructure					100%	\$ 2,252	\$ -	\$ -	\$ -	\$ -	\$ -					2,252
453	Manage Resource Allocation					100%	\$ 113	\$ -	\$ -	\$ -	\$ -	\$ -					113
454	Project Portfolio Management					100%	\$ 3,722	\$ -	\$ -	\$ -	\$ -	\$ -					3,722
455	Manage Technology Collaboration (Internal)	100%					\$ 9,563	\$ 9,563	\$ -	\$ -	\$ -	\$ -					
457	Manage Annual Functional Release Lifecycle					100%	\$ 173	\$ -	\$ -	\$ -	\$ -	\$ -					173
459	Enterprise Risk Management					100%	\$ 155	\$ -	\$ -	\$ -	\$ -	\$ -					155
461	Perform Board Processes					100%	\$ 1,996	\$ -	\$ -	\$ -	\$ -	\$ -					1,996
462	Manage Technology Collaboration (External)	100%					\$ 427	\$ 427	\$ -	\$ -	\$ -	\$ -					
466	Manage Corporate Goal Alignment and Reporting					100%	\$ 1,136	\$ -	\$ -	\$ -	\$ -	\$ -					1,136
469	Manage Project & Effort Lifecycles					100%	\$ 9,226	\$ -	\$ -	\$ -	\$ -	\$ -					9,226
	Total PMB						\$ 29,889	\$ 9,990	\$ -	\$ -	\$ -	\$ -					19,899

ABC Direct Operating Activities												
		GMC				GMC						
Code	ABC Level 2 Activities	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect	Budget	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect
cost category % allocation						budget allocations (amounts in thousands)						
80009 Support Business Services (SBS)												
501	Manage Monthly Financial Cycle					100%	\$ 749	\$ -	\$ -	\$ -	\$ -	\$ 749
502	Invest Corporate Funds					100%	\$ 450	\$ -	\$ -	\$ -	\$ -	\$ 450
503	Manage Financial Reporting					100%	\$ 553	\$ -	\$ -	\$ -	\$ -	\$ 553
504	IT Application, System, & Non-Production Support	80%	15%		5%		\$ 18,437	\$ 14,749	\$ 2,766	\$ -	\$ 922	\$ -
505	IT Asset Management					100%	\$ 787	\$ -	\$ -	\$ -	\$ -	\$ 787
508	IT Configuration, Change & Release Management					100%	\$ 1,376	\$ -	\$ -	\$ -	\$ -	\$ 1,376
510	IT Event Management					100%	\$ 934	\$ -	\$ -	\$ -	\$ -	\$ 934
511	IT Incident Management	60%	30%	5%	5%		\$ 5,821	\$ 3,493	\$ 1,746	\$ 291	\$ 291	\$ -
512	IT Information Security Management					100%	\$ 1,357	\$ -	\$ -	\$ -	\$ -	\$ 1,357
513	IT Problem & Risk Lifecycle Management	60%	30%	5%	5%		\$ 633	\$ 379	\$ 190	\$ 32	\$ 32	\$ -
519	Provision and Manage Access					100%	\$ 197	\$ -	\$ -	\$ -	\$ -	\$ 197
520	Manage Facilities, Physical Security, & Safety					100%	\$ 2,775	\$ -	\$ -	\$ -	\$ -	\$ 2,775
521	Facilities Incident Management					100%	\$ 5	\$ -	\$ -	\$ -	\$ -	\$ 5
522	Corporate Incident Response & Disaster Recovery					100%	\$ 198	\$ -	\$ -	\$ -	\$ -	\$ 198
523	Manage Business Continuity Plan					100%	\$ 1,362	\$ -	\$ -	\$ -	\$ -	\$ 1,362
528	Procurement & Vendor Management					100%	\$ 855	\$ -	\$ -	\$ -	\$ -	\$ 855
529	Provide Legal Advice					100%	\$ 6,973	\$ -	\$ -	\$ -	\$ -	\$ 6,973
533	Manage Evidence Review / Audit					100%	\$ 425	\$ -	\$ -	\$ -	\$ -	\$ 425
535	Tariff Controls Monitoring					100%	\$ 1,123	\$ -	\$ -	\$ -	\$ -	\$ 1,123
536	Manage Internal Audit					100%	\$ 2,209	\$ -	\$ -	\$ -	\$ -	\$ 2,209
537	Monitor Markets	80%		20%			\$ 3,635	\$ 2,908	\$ -	\$ 727	\$ -	\$ -
538	Manage Tariff Rules Violations					100%	\$ 168	\$ -	\$ -	\$ -	\$ -	\$ 168
543	Market Design					100%	\$ 540	\$ -	\$ -	\$ -	\$ -	\$ 540
544	Maintain DMM Database					100%	\$ 663	\$ -	\$ -	\$ -	\$ -	\$ 663
545	Manage Business Process & Continuous Improvement					100%	\$ 615	\$ -	\$ -	\$ -	\$ -	\$ 615
546	Records Management					100%	\$ 490	\$ -	\$ -	\$ -	\$ -	\$ 490
548	Manage Compliance Standards Development and Implementation					100%	\$ 57	\$ -	\$ -	\$ -	\$ -	\$ 57
549	Manage Compliance Investigations					100%	\$ 333	\$ -	\$ -	\$ -	\$ -	\$ 333
550	Manage NERC Compliance					100%	\$ 3,611	\$ -	\$ -	\$ -	\$ -	\$ 3,611
552	IT Reports & Documentation					100%	\$ 55	\$ -	\$ -	\$ -	\$ -	\$ 55
553	Manage Vulnerability Remediation					100%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
555	Manage Root Cause Analysis					100%	\$ 501	\$ -	\$ -	\$ -	\$ -	\$ 501
Total SBS							\$ 57,887	\$ 21,529	\$ 4,702	\$ 1,050	\$ 1,245	\$ 29,361

ABC Direct Operating Activities						GMC									
Code	ABC Level 2 Activities	GMC				Indirect	GMC								
		Market Services	System Operations	CRR Services	Reliability Coordinator		Budget	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect			
						cost category % allocation					budget allocations (amounts in thousands)				
80010 Support Customers & Stakeholders (SCS)															
539	Representing the ISO					100%	\$ 2,448	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,448	
601	Manage Client Inquiries	80%	10%	5%	5%		\$ 3,757	\$ 3,005	\$ 376	\$ 188	\$ 188	\$ -	\$ -		
602	Account Management	80%	10%	5%	5%		\$ 885	\$ 708	\$ 89	\$ 44	\$ 44	\$ -	\$ -		
603	Manage Stakeholder Processes	80%	10%	5%	5%		\$ 2,239	\$ 1,791	\$ 224	\$ 112	\$ 112	\$ -	\$ -		
609	Manage External Affairs					100%	\$ 6,691	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 6,691		
610	Manage Communications & Public Relations					100%	\$ 2,592	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,592		
Total SCS							\$ 18,612	\$ 5,504	\$ 689	\$ 344	\$ 344	\$ 11,731	\$ -		
Total Direct O&M							\$ 212,322	\$ 68,394	\$ 68,375	\$ 3,382	\$ 10,191	\$ 61,980	\$ -		
Direct O&M %							100%	32%	32%	2%	5%	29%			

ABC INDIRECT ACTIVITIES

The same process yielded the following percentages for the indirect activities.

Table 19 — Allocation of Function Hours to Indirect Operating Activities

ABC Process Code	Level 1 ABC Activity	Allocation of Hours By Function		
		Corporate Services	Operational Services	Total
Indirect Operating Costs				
80003	Manage Human Capabilities	98%	2%	100%

These costs were inputs into the allocation matrix shown in *Table 7 — Mapping of ABC Indirect Activities to Cost Categories* — to get the costs to the cost categories.

Table 20 — Allocation of Function Costs to Indirect Operating Activities

		Allocation of Costs By Function (\$ in thousands)		
ABC Process Code	Level 1 ABC Activity	Corporate Services	Operational Services	Total
Indirect Operating Costs				
80003	Manage Human Capabilities	\$ 6,964	\$ 93	\$ 7,057

For indirect activities, the costs were aggregated and allocated as shown in *Table 7 — Mapping of ABC Indirect Activities to Cost Categories*.

Table 21 — Allocation of ABC Indirect Activity Costs to Cost Categories

Indirect ABC Costs	GMC				GMC				
	Market Services	System Operations	CRR Services	Reliability Coordinator	Market Services	System Operations	CRR Services	Reliability Coordinator	
Component	cost category % allocation				budget allocations (amounts in thousands)				
ABC Indirect Costs									
80003: Manage Human Capabilities (MHC)				100%	\$ 7,057	\$ -	\$ -	\$ -	\$ 7,057
Total ABC Indirect Costs					\$ 7,057	\$ -	\$ -	\$ -	\$ 7,057

Step 3: Allocating Remaining Revenue Requirement Components to Cost Categories

DEBT SERVICE AND CASH FUNDED CAPITAL

The allocation of costs is based on the percentage allocation in *Table 8 — Mapping of Debt Service and Capital to Cost Categories*.

Table 22 — Allocation of Debt Service and Cash Funded Capital to Cost Categories

Debt Service Bonds and Cash Funded Capital											
Component	GMC					Budget	GMC				
	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect		Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect
cost category % allocation					budget allocations (amounts in thousands)						
Debt Service Bonds					100%	\$ 14,685	\$ -	\$ -	\$ -	\$ -	14,685
Cash Funded Capital					100%	\$ 15,000	\$ -	\$ -	\$ -	\$ -	15,000

OTHER REVENUE

The components of other revenue were reviewed and all revenues allocated pursuant to *Table 9 — Mapping of Other Revenue to Cost Categories*.

Table 23 — Allocation of Other Revenue to Cost Categories

Other Costs and Revenue											
Component	GMC					Budget	GMC				
	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect		Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect
cost category % allocation					budget allocations (amounts in thousands)						
Other Costs and Revenue											
Energy Imbalance Market Administration Charges					100%	\$ 14,100	\$ -	\$ -	\$ -	\$ -	\$ 14,100
Nodal Pricing Model Fee	50%	50%				\$ 8,400	\$ 4,200	\$ 4,200	\$ -	\$ -	\$ -
Intermittent Resource Forecasting Fees	80%	15%		5%		\$ 5,500	\$ 4,400	\$ 825	\$ -	\$ 275	\$ -
Interest Earnings					100%	\$ 3,392	\$ -	\$ -	\$ -	\$ -	\$ 3,392
Generator Interconnection Project Fees and Application Fees		100%				\$ 2,000	\$ -	\$ 2,000	\$ -	\$ -	\$ -
HANA Administrative Fees*				100%		\$ 1,070	\$ -	\$ -	\$ -	\$ 1,070	\$ -
California-Oregon Intertie (COI) Path Operator Fees		100%				\$ 700	\$ -	\$ 700	\$ -	\$ -	\$ -
Metered Sub-Station Penalties					100%	\$ 440	\$ -	\$ -	\$ -	\$ -	\$ 440
SC Application Fees					100%	\$ 290	\$ -	\$ -	\$ -	\$ -	\$ 290
Planning Coordinator Fees		100%				\$ 110	\$ -	\$ 110	\$ -	\$ -	\$ -
CRR Application Fees					100%	\$ 60	\$ -	\$ -	\$ -	\$ -	\$ 60
Sub-Total (without RC Funding Requirement)						\$ 36,062	\$ 8,600	\$ 7,835	\$ -	\$ 1,345	\$ 18,282
Reliability Coordinator Funding Requirement					100%	\$ 18,618	\$ -	\$ -	\$ -	\$ 18,618	\$ -
Total Other Costs and Revenue						\$ 54,680	\$ 8,600	\$ 7,835	\$ -	\$ 19,963	\$ 18,282

OPERATING COST RESERVE ADJUSTMENT

The components of the operating cost reserve adjustment were reviewed and allocated pursuant to *Table 10 — Mapping of Operating Cost Reserve Adjustment to Cost Categories*.

Table 24 — Allocation of Operating Cost Reserve Adjustment to Cost Categories

Operating Costs Reserve Adjustment											
Component	GMC					Budget	GMC				
	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect		Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect
	<i>cost category % allocation</i>						<i>budget allocations (amounts in thousands)</i>				
Operating Cost Reserve Adjustment											
Change in 15% Operating Cost Reserve					100%	\$ (2,035)	\$ -	\$ -	\$ -	\$ -	\$ (2,035)
25% Debt Service Reserve for Bonds					100%	\$ 3,345	\$ -	\$ -	\$ -	\$ -	\$ 3,345
Revenue Budget to Actual Delta					100%	\$ 8,338	\$ -	\$ -	\$ -	\$ -	\$ 8,338
Expense Budget to Actual Delta					100%	\$ 3,845	\$ -	\$ -	\$ -	\$ -	\$ 3,845
Total Operating Cost Reserve Adjustment						\$ 13,493	\$ -	\$ -	\$ -	\$ -	\$ 13,493

Step 4: Aggregating Revenue Requirement into Cost Categories

The individual revenue requirements were aggregated and indirect costs allocated based on total direct costs.

The Reliability Coordinator costs, which represent 8% of revenue requirement prior to the RC Funding Requirement adjustment, were offset by the RC Funding Requirement. The remaining balance represents the GMC revenue requirement to be collected through the GMC rates and fees.

Table 25 — Allocation of Revenue Requirement to Cost Categories

Modified Revenue Requirement		GMC				
Component	Budget	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect
<i>budget allocations (amounts in thousands)</i>						
Direct Costs	\$ 212,322	\$ 68,394	\$ 68,375	\$ 3,382	\$ 10,191	\$ 61,980
Indirect Costs	\$ 7,057	\$ -	\$ -	\$ -	\$ -	\$ 7,057
Non-ABC Costs	\$ 39,043	\$ 2,063	\$ 644	\$ 50	\$ 1,645	\$ 34,641
Total O&M	\$ 258,422	\$ 70,457	\$ 69,019	\$ 3,432	\$ 11,836	\$ 103,678
Debt Service	\$ 14,685	\$ -	\$ -	\$ -	\$ -	\$ 14,685
Cash Funded Capital	\$ 15,000	\$ -	\$ -	\$ -	\$ -	\$ 15,000
Total Debt Service and Capital	\$ 29,685	\$ -	\$ -	\$ -	\$ -	\$ 29,685
Other Costs and Revenues (without RC Funding Requirement)	\$ (36,062)	\$ (8,600)	\$ (7,835)	\$ -	\$ (1,345)	\$ (18,282)
Operating Cost Reserve Adjustment	\$ (13,493)	\$ -	\$ -	\$ -	\$ -	\$ (13,493)
Total Other Revenue and Operating Costs Reserve Adj	\$ (49,555)	\$ (8,600)	\$ (7,835)	\$ -	\$ (1,345)	\$ (31,775)
Revenue Requirement Sub-Total Before Indirect Allocations	\$ 238,552	\$ 61,857	\$ 61,184	\$ 3,432	\$ 10,491	\$ 101,588
Direct Costs %		45%	45%	2%	8%	
Indirect Costs Allocated Based on Direct Cost %		45,715	45,715	2,032	8,127	(101,588)
Revenue Requirement Sub-Total Before RC Funding Requirement Adjustment	\$ 238,552	\$ 107,572	\$ 106,899	\$ 5,464	\$ 18,618	\$ -
RC Funding Percentage		45%	45%	2%	8%	
Reliability Coordinator Funding Requirement	\$ (18,618)	\$ -	\$ -	\$ -	\$ (18,618)	\$ -
GMC Revenue Requirement	\$ 219,934	\$ 107,572	\$ 106,899	\$ 5,464	\$ -	\$ -
Cost Category Percentages for GMC Rates		49%	49%	2%		

Step 5: Calculation of 2022 Rates Using New Cost Category Percentages

Although not necessary to determine the cost category percentages, the rates are needed to determine the WEIM fee. The GMC rates were determined by first estimating fees as shown in the following table.

Table 26 — Estimation of Fee Revenue and Mapping of Fees to Cost Categories

Modified Revenue Requirement						
Fee	Estimated 2022		Budget	Market Services	System Operations	CRRs
	Volumes	Rate				
<i>(amounts in thousands)</i>						
Bid Segment Fees	107,379,067	\$ 0.0050	\$ 537	\$ 537		
Inter-SC Trade Fees	2,668,297	\$ 1.0000	\$ 2,668	\$ 2,668		
SCID Fees	439	\$ 1,500.0000	\$ 7,902	\$ 7,902		
TOR Charge	3,142,334	\$ 0.3200	\$ 1,006		\$ 1,006	
CRR Auction Bid Fees	1,054,603	\$ 1.0000	\$ 1,055			\$ 1,055
Total			\$ 13,168	\$ 11,107	\$ 1,006	\$ 1,055

The estimated fees were then deducted from the revenue requirement resulting in the remaining revenue requirement to be collected. The remaining amount to be collected is divided by the estimated volumes of billing determinants for each cost category to determine the respective rates.

Table 27 — 2022 GMC Rates Using Revised Cost Category Percentages

Modified Revenue Requirement		GMC			
Component	Budget	Market Services	System Operations	CRR Services	
GMC Revenue Requirement	\$ 219,934	\$ 107,572	\$ 106,899	\$ 5,464	
<i>Cost Category Percentages for GMC Rates</i>		49%	49%	2%	
Less Fees					
Bid Segment Fees	\$ (537)	\$ (537)	\$ -	\$ -	
Inter-SC Trade Fees	\$ (2,668)	\$ (2,668)	\$ -	\$ -	
SCID Charge	\$ (7,902)	\$ (7,902)	\$ -	\$ -	
TOR Charge	\$ (1,006)	\$ -	\$ (1,006)	\$ -	
CRR Auction Bid Fees	\$ (1,055)	\$ -	\$ -	\$ (1,055)	
Total Fees	\$ (13,168)	\$ (11,107)	\$ (1,006)	\$ (1,055)	
Remaining Revenue Requirement to Collect	\$ 206,766	\$ 96,465	\$ 105,893	\$ 4,409	
Estimated Volumes					
Estimated Volumes		533,233	440,760	420,133	
Total Estimated Volumes (GWh)		533,233	440,760	420,133	
2022 Rates/MWh Using Revised Percentages		\$ 0.1809	\$ 0.2403	\$ 0.0105	

Summary of GMC Cost Category Percentage Changes

The following table shows the results of the current Cost-of-Service analysis compared to the previous analysis, which indicates there is no percentage shift of resources (time or dollars) in the Market Services, System Operations, or the CRR Services cost categories percentages.

Table 28 — Summary of GMC Cost Category Percentages and Costs

Cost Category Percentages and Costs <i>(\$\$ in thousands)</i>	2019		2022 Modified for 2024	
	\$\$	%	\$\$	%
	Market Services	\$ 86,800	49%	\$ 107,572
System Operations	\$ 88,061	49%	\$ 106,899	49%
CRR Services	\$ 3,965	2%	\$ 5,464	2%
Total	\$ 178,826	100%	\$ 219,934	100%

The following table shows the results of the breakout of costs by direct and indirect compared to the previous analysis.

Table 29 — Summary of Direct and Indirect Costs

Direct Costs vs. Indirect Costs History <i>(\$\$ in thousands)</i>	2019		2022 Modified for 2024	
	\$\$	%	\$\$	%
	Direct Costs	\$ 89,555	50%	\$ 126,473
Indirect Costs	\$ 89,271	50%	\$ 93,461	42%
Total	\$ 178,826	100%	\$ 219,934	100%

Bifurcation of the System Operations Charge

The CAISO is proposing to bifurcate its System Operations Charge to a System Operations Real-Time Dispatch Charge and a System Operations Balance Authority Area Services Charge effective January 1, 2025. As the bifurcation of the System Operations Charge is already part of the WEIM Administrative Charge calculations, this proposal will simplify the process by removing a step in the charge calculation process and provide for greater

granularity in the calculations. In addition, the new Systems Operations Real-Time Dispatch Charge will supersede the WEIM System Operations Charge and the recently proposed EDAM Systems Operations Charge.

The Systems Operations Real-Time Dispatch Charge will represent the costs to support real-time dispatch services that the CAISO offers to its BAA customers as well as to its WEIM and EDAM customers; and it applies to metered flows in MWh of supply and demand. The calculation for how much to collect of the System Operations Real-Time Dispatch portion of the annual GMC Revenue Requirement will be based on the latest Cost-of-Service study results. The GMC Revenue Requirement will be multiplied by the latest study's System Operations Real-Time Dispatch cost category percentage to determine the cost to collect. To determine the price per MWh, the cost will be divided by the projected total generation, import, load and export (gross meter) MWh volumes; total volumes include the CAISO BAA, WEIM, and EDAM participants.

The System Operations Balancing Authority Area Services Charge will represent the costs to support services within the CAISO BAA such as transmission planning, summer readiness, and planning coordinator. The calculation for how much to collect of the System Operations Balancing Authority Area portion of the annual GMC Revenue Requirement will be based on the latest Cost-of-Service study results. The GMC Revenue Requirement will be multiplied by the latest study's System Operations Balancing Authority Area cost category percentage to determine the cost to collect. To determine the price per MWh, the cost will be divided by the projected total generation, import, load and export (gross meter) MWh volumes.

Reliability Coordinator Services

In November 2018, FERC approved the rates, terms, and conditions for the CAISO Reliability Coordinator services with operations beginning in 2019. Most of the process and tasks necessary to support the RC services were already identified in the CAISO's ABC process and task codes; however, they were not directly identified as a RC Services function. To address this gap, beginning with the 2020 Cost-of-Service study, CAISO mapped the tasks identified as contributing to RC services to a new cost category, Reliability Coordinator, by means of percentage allocation. This approach allows the CAISO to leverage against the stability of its annual revenue requirement to develop an annual RC Funding Requirement thus benefiting both RC and existing GMC customers.

By mapping the tasks to the RC cost category, the CAISO is able to calculate the RC funding percentage. This represents the direct and indirect time and expense necessary for the CAISO to perform its RC services and functions. The RC funding percentage is used similarly to the GMC cost category percentages, as the RC funding percentage is multiplied against the revenue requirement to determine the RC Funding Requirement. The RC Funding Requirement is then divided by the reported MWh to determine the RC rate/MWh.

Table 30 — Allocation of Revenue Requirement to RC Cost Category

Modified Revenue Requirement		GMC				
		Budget	Market Services	System Operations	CRR Services	Reliability Coordinator
		<i>budget allocations (amounts in thousands)</i>				
Direct Costs	\$ 212,322	\$ 68,394	\$ 68,375	\$ 3,382	\$ 10,191	\$ 61,980
Indirect Costs	\$ 7,057	\$ -	\$ -	\$ -	\$ -	\$ 7,057
Non-ABC Costs	\$ 39,043	\$ 2,063	\$ 644	\$ 50	\$ 1,645	\$ 34,641
Total O&M	\$ 258,422	\$ 70,457	\$ 69,019	\$ 3,432	\$ 11,836	\$ 103,678
O&M Direct %		46%	45%	2%	8%	
Debt Service	\$ 14,685	\$ -	\$ -	\$ -	\$ -	\$ 14,685
Cash Funded Capital	\$ 15,000	\$ -	\$ -	\$ -	\$ -	\$ 15,000
Total Debt Service and Capital	\$ 29,685	\$ -	\$ -	\$ -	\$ -	\$ 29,685
Other Costs and Revenues (without RC Funding Requirement)	\$ (36,062)	\$ (8,600)	\$ (7,835)	\$ -	\$ (1,345)	\$ (18,282)
Operating Cost Reserve Adjustment	\$ (13,493)	\$ -	\$ -	\$ -	\$ -	\$ (13,493)
Total Other Revenue and Operating Costs Reserve Adj	\$ (49,555)	\$ (8,600)	\$ (7,835)	\$ -	\$ (1,345)	\$ (31,775)
Revenue Requirement Sub-Total Before Indirect Allocations	\$ 238,552	\$ 61,857	\$ 61,184	\$ 3,432	\$ 10,491	\$ 101,588
Direct Costs %		45%	45%	2%	8%	
Indirect Costs Allocated Based on Direct Cost %		45,715	45,715	2,032	8,127	(101,588)
Revenue Requirement Sub-Total Before RC Funding Requirement Adjustment	\$ 238,552	\$ 107,572	\$ 106,899	\$ 5,464	\$ 18,618	\$ -
RC Funding Percentage		45%	45%	2%	8%	
Reliability Coordinator Funding Requirement	\$ (18,618)	\$ -	\$ -	\$ -	\$ (18,618)	\$ -
GMC Revenue Requirement	\$ 219,934	\$ 107,572	\$ 106,899	\$ 5,464	\$ -	\$ -
Cost Category Percentages for GMC Rates		49%	49%	2%		

The mapping of RC services is included in the aforementioned sections' tables. The culmination of the mapping resulted in a RC funding percentage of 8%, a slight reduction as a result of an increase in resources supporting efforts in the other cost categories.

Table 31 – Summary of RC Funding Percentage Changes

Cost Category	2019 Study Effective 2021 GMC	2022 Study Effective 2024 GMC	Change from Prior
Reliability Coordinator Services	9%	8%	-1%

Western Energy Imbalance Market

The WEIM provides entities with the opportunity to leverage the CAISO’s existing real-time market platform to facilitate five-minute economic dispatch. The WEIM provides reliability and economic benefits to existing market participants and new WEIM entities by utilizing the CAISO’s 15-minute market and real-time dispatch. The WEIM relies on the CAISO’s existing real-time portion of the Market Services activities and System Operations activities.

Conceptually, WEIM participants will pay the same rate as existing customers but only for the real-time market and real-time dispatch activities specifically related to WEIM. To determine the updated WEIM fee, using the 2023 Cost-of-Service study, the CAISO identified and aggregated the real-time activity costs allocated to the two main cost categories – Market Services and System Operations. The CAISO then allocated indirect costs to the categories based on the proportion to direct costs. The respective real-time cost proportions were then applied to the respective rates for Market Services and System Operations.

The costs include the WEIM share of all components of the revenue requirement, as WEIM participants will pay the same rate as existing customers for the real-time activities they are using.

Application of ABC to WEIM Rate Structure

As noted earlier, the ABC analysis disaggregated the CAISO’s primary business functions into nine core processes (level 1 activities). Each core activity was then divided into major processes (level 2 activities) which were mapped to the corresponding level 1 activity. The first step was to allocate the two cost category activities to the corresponding real-time components. The Market Services component relates to either the Real-Time Market

or the Day-Ahead Market. The System Operations component relates to either Real-Time Dispatch or Balancing Authority (BA) Services.

Mapping of Cost Categories to WEIM Activities

Market Services' Real-Time Market and System Operations' Real-Time Dispatch activities are mapped to the WEIM rate structure. These activities are defined, linked to specific processes, and measured using the standard percentage allocations presented in *Table 5 – Mapping of ABC Direct Operating Activities to Cost Categories*. If the activity was identified as indirect or the attribute was not distinguishable to any specific category, it was not included in the initial steps of the allocation process but rather allocated at the end of the process based on percentages of direct allocable costs.

MARKET SERVICES

The following mapping only addresses those level 2 activities that are mapped to Market Services, which were then in turn mapped to either the Real-Time Market or the Day-Ahead Market. The direct ABC level 2 activities mapped to market services are taken from *Table 5 – Mapping of ABC Direct Operating Activities to Cost Categories*.

Table 32 —
Standard Market Services
Split Percentage
Allocations

Market Services Split		
Real-Time Market	Day-Ahead Market	Comments
<i>(% of cost to allocate to category)</i>		
100%		Efforts support Real-Time Market functions.
	100%	Efforts support Day-Ahead Market functions.
50%	50%	Efforts support Real-Time Market and Day-Ahead Market functions equally.
80%	20%	Efforts predominately support Real-Time Market functions.
20%	80%	Efforts predominately support Day-Ahead Market functions.

Table 33 — Mapping of Market Services ABC Direct Operating Activities

ABC Direct Operating Activities		Market Services Split			
Code	ABC Level 2 Activities	GMC	Real-Time Market	Day-Ahead Market	Comments
		Market Services			
		<i>cost category % allocation</i>	<i>category % allocation</i>	<i>category % allocation</i>	
80001 Develop Infrastructure (DI)					
201	Develop and Monitor Regulatory Contract Procedures	95%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
80002 Develop Markets (DM)					
229	Develop State / Federal Regulatory Policy	40%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
230	BPM Change Management	80%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
231	Develop Infrastructure Policy	40%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
232	Perform Market Analysis	80%	80%	20%	Efforts predominately support Real-Time market functions.
234	Manage Regulatory Contract Negotiations	95%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
80004 Manage Market & Reliability Data & Modeling (MMR)					
301	Manage Full Network Model Maintenance	45%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
304	EMAA Telemetry	50%	100%		Efforts support Real-Time market functions.
308	Manage Credit & Collateral	40%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
309	Resource Management	50%	80%	20%	Efforts predominately support Real-Time market functions.
320	Provide Stakeholder Training	60%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
321	Schedule Coordinator Management	45%	80%	20%	Efforts predominately support Real-Time market functions.
322	Register, Modify and Terminate PDR Resource	100%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
323	Calculate & Monitor Energy Costs & Indices	60%	80%	20%	Efforts predominately support Real-Time market functions. Efforts support weekly validation of Flex Requirement and daily Regulation Requirement, data validation and analysis, reporting, Tariff control process development, testing and customer support.
331	Operational Requirements	60%	50%	50%	

ABC Direct Operating Activities		Market Services Split			
Code	ABC Level 2 Activities	GMC	Real-Time Market	Day-Ahead Market	Comments
		Market Services			
		<i>cost category % allocation</i>	<i>category % allocation</i>	<i>category % allocation</i>	
80005 Manage Market & Grid (MMG)					
352	Manage Day-Ahead Market Support	95%		100%	Efforts support Day-Ahead market functions.
353	Operations Real-Time Support	80%	100%		Efforts support Real-Time market functions.
355	Outage Model & Management	5%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
360	Real-Time Operations	20%	100%		Efforts support Real-Time market functions.
362	Manage Operations Engineering Support	15%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
368	Manage Day-Ahead and Market Operations	100%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
371	Load Forecast	40%	50%	50%	Efforts support Day-Ahead and Real-Time operational forecast, vendor management, data validation, IT troubleshooting, and customer/market support.
372	Renewable Forecast	50%	50%	50%	Efforts support Eligible Intermittent Resource (EIR) onboarding/registration, configuration, modeling, data validation, Day-Ahead and Real Time operational forecast, vendor management, data validation and IT troubleshooting.
373	Weather Forecast	40%	50%	50%	Efforts support renewables, provide recommendation, data quality and validation, variability assessment, temperature forecast, and summer/winter assessment.
80007 Manage Operations Support & Settlements (MOS)					
401	Perform Market Validation	80%	80%	20%	Efforts predominately support Real-Time market functions.
402	Manage Dispute Analysis & Resolution	100%	80%	20%	Efforts predominately support Real-Time market functions.
403	Manage Market Quality System	50%	80%	20%	Efforts predominately support Real-Time market functions.
406	Manage Rules of Conduct				
409	Meter Data Acquisition and Processing	100%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
411	Manage Market Clearing	45%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
412	Manage Market Billing & Settlements	45%	80%	20%	Efforts predominately support Real-Time market functions.
414	Manage Settlements Quarterly Release Cycle	45%	80%	20%	Efforts predominately support Real-Time market functions.
417	Perform Market Report	80%	80%	20%	Efforts predominately support Real-Time market functions.
418	Manage Good Faith Negotiation Requests	100%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
419	Manage Price Corrections	50%	80%	20%	Efforts predominately support Real-Time market functions.

ABC Direct Operating Activities		Market Services Split			
Code	ABC Level 2 Activities	GMC	Real-Time	Day-Ahead	Comments
		Market Services	Market	Market	
		<i>cost category % allocation</i>	<i>category % allocation</i>		
80008 Plan & Manage Business (PMB)					
455	Manage Technology Collaboration (Internal)	100%	80%	20%	Efforts predominately support Real-Time market functions. Efforts support Real-Time market and Day-Ahead market functions equally.
462	Manage Technology Collaboration (External)	100%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
80009 Support Business Services (SBS)					
504	IT Application, System, & Non-Production Support	80%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
511	IT Incident Management	60%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
513	IT Problem & Risk Lifecycle Management	60%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
537	Monitor Markets	80%	50%	50%	Efforts support Real-Time market and Day-Ahead market functions equally.
80010 Support Customers & Stakeholders (SCS)					
601	Manage Client Inquiries	80%	80%	20%	Efforts predominately support Real-Time market functions.
602	Account Management	80%	80%	20%	Efforts predominately support Real-Time market functions.
603	Manage Stakeholder Processes	80%	20%	80%	Efforts predominately support Day-Ahead market functions.

The market services related non-ABC support costs were mapped from *Table 6 – Mapping of Non-ABC Support Costs to Cost Categories*.

Table 34 — Mapping of Market Services Non-ABC Support Costs

Non-ABC Support Costs		Market Services Split		Comments
Component	GMC	Real-Time	Day-Ahead	
	Market Services	Market	Market	
	<i>cost category % allocation</i>	<i>% of budget allocation</i>		
Non-ABC Support Costs				
Corporate Services				
WEIM Market Expert	100%	100%		Cost supports Market Services (Real-Time Market).
SSAE 16 Audit	45%	80%	20%	Use Process 80007, Task 412 allocations.
Operations Audit	22%	75%	25%	Use Process 80005 total allocations.
Operational Services				
Intermittent Resource Forecasting Costs	80%	100%		Use Process 80005, Task 353 allocations.
Market Surveillance Committee	80%	80%	20%	Use Process 80002, Task 232 allocations.

Then other revenue mapped to market services from *Table 9 – Mapping of Other Revenue to Cost Categories* were mapped to real-time market and / or day ahead market.

Table 35 — Mapping of Market Services Other Revenue

Other Costs and Revenue		Market Services Split		Comments
Component	GMC	Real-Time	Day-Ahead	
	Market Services	Market	Market	
	<i>cost category % allocation</i>	<i>% of budget allocation</i>		
Other Costs and Revenue				
Energy Imbalance Market Administration Charges				Attributes are not distinguishable to any specific category.
Nodal Pricing Model Fee	50%	50%	50%	Fee offsets Market Services' (Real-Time and Day-Ahead)
Intermittent Resource Forecasting Fees	80%	100%		Use Process 80005, Task 353 allocations.

Market services fees from *Table 26 – Estimation of Fee Revenue and Mapping of Fees to Cost Categories* are mapped as follows.

Table 36 — Mapping of Market Services Fees

Modified Revenue Requirement	Market Services	Market Services Split	
		Real-Time Market	Day-Ahead Market
Fee	<i>cost category % allocation</i>	<i>(% of cost to allocate to category)</i>	
Bid Segment Fees	100%	50%	50%
Inter-SC Trade Fees	100%		100%
SCID Fees	100%	50%	50%

SYSTEM OPERATIONS

The following mapping only addresses those level 2 activities that are mapped to System Operations, which were then in turn mapped to either the Real-Time Dispatch or Balancing Authority Services. The direct ABC level 2 activities mapped to system operations is taken from *Table 5 – Mapping of ABC Direct Operating Activities to Cost Categories*.

Table 37 —

**Standard
System Operations
Split Percentage
Allocations**

System Operations Split		
Real-Time Dispatch	Balancing Authority Services	Comments
<i>(% of cost to allocate to category)</i>		
100%		Efforts support Real-Time Dispatch functions.
	100%	Efforts support Balancing Authority Services functions.
50%	50%	Efforts support Real-Time Dispatch and Balancing Authority Services functions equally.
80%	20%	Efforts predominately support Real-Time Dispatch functions.
20%	80%	Efforts predominately support Balancing Authority Services functions.

Table 38 — Mapping of System Operations ABC Direct Operating Activities

ABC Direct Operating Activities		System Operations Split		Comments	
Code	ABC Level 2 Activities	GMC	Real-Time Dispatch		BA Services
		System Operations	category % allocation		
		cost category % allocation			
80001 Develop Infrastructure (DI)					
202	Manage Generator Interconnection Agreements	100%	100%	Efforts support balancing authority functions.	
203	Manage Generator Interconnection Process	100%	100%	Efforts support balancing authority functions.	
204	Manage Long Term Transmission Planning	100%	100%	Efforts support balancing authority functions.	
205	Manage New Transmission Resources	95%	100%	Efforts support balancing authority functions.	
206	Manage Transmission Maintenance Standards	100%	100%	Efforts support balancing authority functions.	
207	Manage Load Resource Data	100%	100%	Efforts support balancing authority functions.	
208	Seasonal Assessment	100%	100%	Efforts support balancing authority functions.	
209	Manage Queue Management	100%	100%	Efforts support balancing authority functions.	
80002 Develop Markets (DM)					
229	Develop State / Federal Regulatory Policy	60%	100%	Efforts support balancing authority functions.	
230	BPM Change Management	10%	100%	Efforts support Real-Time dispatch functions.	
231	Develop Infrastructure Policy	60%	100%	Efforts support balancing authority functions.	
232	Perform Market Analysis	15%	100%	Efforts support Real-Time dispatch functions.	
80004 Manage Market & Reliability Data & Modeling (MMR)					
301	Manage Full Network Model Maintenance	45%	100%	Efforts support Real-Time dispatch functions as the grid operates in Real-Time.	
302	Plan & Develop Operations Simulator Training	95%	100%	Efforts support Real-Time dispatch functions as the grid operates in Real-Time.	
304	EMAA Telemetry	50%	20%	80%	Efforts predominately support balancing authority functions.
308	Manage Credit & Collateral	40%	50%	50%	Efforts support Real-Time dispatch and balancing authority functions equally.
309	Resource Management	50%	50%	50%	Efforts support Real-Time dispatch and balancing authority functions equally.
310	Manage Reliability Requirements	100%	100%	Efforts support balancing authority functions.	
311	Manage Operations Planning	95%	20%	80%	Efforts predominately support balancing authority functions.
312	Manage WECC Studies	100%	20%	80%	Efforts predominately support balancing authority functions.
314	Manage & Facilitate Procedure Maintenance	95%	20%	80%	Efforts predominately support balancing authority functions.
316	Plan & Develop Operations Training	95%	100%	Efforts support Real-Time dispatch functions.	
317	Execute & Track Operations Training	95%	100%	Efforts support Real-Time dispatch functions.	
320	Provide Stakeholder Training	30%	50%	50%	Efforts support Real-Time dispatch and balancing authority functions equally.
321	Schedule Coordinator Management	45%	20%	80%	Efforts predominately support balancing authority functions.
323	Calculate & Monitor Energy Costs & Indices	35%	100%	Efforts support Real-Time dispatch functions. Efforts support weekly validation of Flex Requirement and daily Regulation Requirement, data validation and analysis, reporting, Tariff control process development, testing and customer support.	
331	Operational Requirements	40%	50%	50%	

ABC Direct Operating Activities		System Operations Split		Comments	
Code	ABC Level 2 Activities	GMC	System Operations Split		
		System Operations	Real-Time Dispatch		BA Services
		<i>cost category % allocation</i>	<i>category % allocation</i>		
80005 Manage Market & Grid (MMG)					
353	Operations Real-Time Support	15%	100%		Efforts support Real-Time dispatch functions.
355	Outage Model & Management	60%	20%	80%	Efforts predominately support balancing authority functions.
360	Real-Time Operations	80%	50%	50%	Efforts support Real-Time dispatch and balancing authority functions equally.
362	Manage Operations Engineering Support	80%	100%		Efforts support Real-Time dispatch functions.
367	Manage Operations Compliance & Event Analysis	50%		100%	Efforts support balancing authority functions.
371	Load Forecast	50%	50%	50%	Efforts support Day-Ahead and Real Time operational forecast, vendor management, data validation, IT troubleshooting, and customer/market support.
372	Renewable Forecast	50%	80%	20%	Efforts support Eligible Intermittent Resource (EIR) onboarding/registration, configuration, modeling, data validation, Day-Ahead and Real Time operational forecast, vendor management, data validation and IT troubleshooting.
373	Weather Forecast	50%	50%	50%	Efforts support renewables, provide recommendation, data quality and validation, variability assessment, temperature forecast, and summer/winter assessment.
80007 Manage Operations Support & Settlements (MOS)					
401	Perform Market Validation	20%	100%		Efforts support Real-Time dispatch functions.
403	Manage Market Quality System	40%	100%		Efforts support Real-Time dispatch functions.
411	Manage Market Clearing	45%	50%	50%	Efforts support Real-Time dispatch and balancing authority functions equally.
412	Manage Market Billing & Settlements	45%	100%		Efforts support Real-Time dispatch functions.
414	Manage Settlements Quarterly Release Cycle	45%	100%		Efforts support Real-Time dispatch functions.
417	Perform Market Report	20%	100%		Efforts support Real-Time dispatch functions.
419	Manage Price Corrections	40%	100%		Efforts support Real-Time dispatch functions.
80009 Support Business Services (SBS)					
504	IT Application, System, & Non-Production Support	15%	50%	50%	Efforts support Real-Time dispatch and balancing authority functions equally.
511	IT Incident Management	30%	100%		Efforts support Real-Time dispatch functions.
513	IT Problem & Risk Lifecycle Management	30%	100%		Efforts support Real-Time dispatch functions.
80010 Support Customers & Stakeholders (SCS)					
601	Manage Client Inquiries	10%	100%		Efforts support Real-Time dispatch functions.
602	Account Management	10%	100%		Efforts support Real-Time dispatch functions.
603	Manage Stakeholder Processes	10%	100%		Efforts support Real-Time dispatch functions.

The system operations related to non-ABC support costs were mapped from *Table 6 – Mapping of Non-ABC Support Costs to Cost Categories*.

Table 39 — Mapping of System Operations Non-ABC Support Costs

Non-ABC Support Costs		System Operations Split		Comments
Component	GMC	Real-Time Dispatch	BA Services	
	System Operations			
	<i>cost category % allocation</i>	<i>% of budget allocation</i>		
Non-ABC Support Costs				
Corporate Services				
SSAE 16 Audit	45%	100%		Use Process 80007, Task 412 allocations.
Operations Audit	59%	55%	45%	Use Process 80005 total allocations.
Operational Services				
Intermittent Resource Forecasting Costs	15%	100%		Use Process 80005, Task 353 allocations.
Market Surveillance Committee	15%	100%		Use Process 80002, Task 232 allocations.

Then other revenue mapped to system operations from *Table 9 – Mapping of Other Revenue to Cost Categories* were allocated to real-time dispatch and / or balancing authority services.

Table 40 — Mapping of System Operations Other Revenue

Other Costs and Revenue		System Operations Split		Comments
Component	GMC	Real-Time Dispatch	BA Services	
	System Operations			
	<i>cost category % allocation</i>	<i>% of budget allocation</i>		
Other Costs and Revenue				
Nodal Pricing Model Fee	50%	100%		Fee offsets Market Services' (Real-Time and Day-Ahead)
Intermittent Resource Forecasting Fees	15%	100%		Use Process 80005, Task 353 allocations.
Generator Interconnection Project Fees and Application Fees	100%		100%	Use Process 80001, Task 203 allocations.
California-Oregon Intertie (COI) Path Operator Fees	100%		100%	Fees offset System Operations costs.
Planning Coordinator Fees	100%		100%	Use Process 80001, Task 204 allocations.

System Operations fees from *Table 26 – Estimation of Fee Revenue and Mapping of Fees to Cost Categories* were mapped as follows.

Table 41 — Mapping of System Operations Fees

Modified Revenue Requirement	System Operations	System Operations Split		Comments
Fee		Real-Time Dispatch	Balancing Authority Services	
	<i>cost category % allocation</i>	<i>(% of cost to allocate to category)</i>		
TOR Charge	100%	100%		Real-Time function.
Total				

Costing the Cost Categories to WEIM Activities

The amounts from the 2023 Cost-of-Service study were applied to the Market Services and System Operations categories to derive the direct real-time activity costs.

Table 42 — Components of the 2022 Modified GMC Revenue Requirement

Modified GMC Revenue Requirement		Market Services	System Operations	CRR Services
Component	Budget			
Non-ABC O&M Support Costs	\$ 39,043	\$ 2,063	\$ 644	\$ 50
Direct ABC O&M Costs	\$ 212,322	\$ 68,394	\$ 68,375	\$ 3,382
Debt Service	\$ 14,685	\$ -	\$ -	\$ -
Cash Funded Capital	\$ 15,000	\$ -	\$ -	\$ -
Other Costs and Revenues	\$ (54,680)	\$ (8,600)	\$ (7,835)	\$ -
Operating Costs Reserve Adjustment	\$ (13,493)	\$ -	\$ -	\$ -
Subtotal	\$ 212,877	\$ 61,857	\$ 61,184	\$ 3,432
Indirect Costs	\$ 7,057	\$ 45,715	\$ 45,715	\$ 2,032
GMC Revenue Requirement Before Fees	\$ 219,934	\$ 107,572	\$ 106,899	\$ 5,464
Less Fees	\$ (13,168)	\$ (11,107)	\$ (1,006)	\$ (1,055)
Remaining Revenue Requirement to Collect	\$ 206,766	\$ 96,465	\$ 105,893	\$ 4,409

Completing the analysis required the following steps:

1. Applying WEIM activity percentages to non-ABC O&M support costs;
2. Applying WEIM activity percentages to ABC direct O&M costs;
3. Applying WEIM activity percentages to other revenue;
4. Aggregating costs and allocate indirect costs to WEIM activities based on percentage of direct costs and allocation of fees to WEIM activities to determine the resulting WEIM activity amounts and percentages;
and
5. Applying the WEIM activity percentage to the applicable cost category (Market Services and / or System Operations) to determine the WEIM component.

Step 1: Applying WEIM Activity Percentages to Non-ABC O&M Support Costs

The non-ABC support costs from *Table 13 – Allocation of Non-ABC Support to Cost Categories* were allocated using the percentages shown in *Table 6 - Mapping of Non-ABC Support Costs* above.

Table 43 — Allocation of Market Services Non-ABC Support Costs

Non-ABC Support Costs		Market Services Split		Market Services Split		
Component	GMC	Real-Time Market	Day-Ahead Market	Category Budget	Real-Time Market	Day-Ahead Market
	Market Services					
Non-ABC Support Costs						
cost category % allocation						
Corporate Services						
WEIM Market Expert	100%	100%		\$ 248	\$ 248	\$ -
SSAE 16 Audit	45%	80%	20%	\$ 289	\$ 231	\$ 58
Operations Audit	22%	75%	25%	\$ 28	\$ 21	\$ 7
Corporate Services Total				\$ 565	\$ 500	\$ 65
Operational Services						
Intermittent Resource Forecasting Costs	80%	100%		\$ 1,215	\$ 1,215	\$ -
Market Surveillance Committee	80%	80%	20%	\$ 283	\$ 226	\$ 57
Operational Services Total				\$ 1,498	\$ 1,441	\$ 57
Total Non-ABC Support Costs				\$ 2,063	\$ 1,941	\$ 122

Table 44 — Allocation of System Operations Non-ABC Support Costs

Non-ABC Support Costs		System Operations Split		System Operations Split		
Component	GMC	Real-Time Dispatch	BA Services	Category Budget	Real-Time Dispatch	BA Services
	System Operations					
Non-ABC Support Costs						
cost category % allocation						
Corporate Services						
SSAE 16 Audit	45%	100%		\$ 288	\$ 288	\$ -
Operations Audit	59%	55%	45%	\$ 75	\$ 41	\$ 34
Corporate Services Total				\$ 363	\$ 329	\$ 34
Operational Services						
Intermittent Resource Forecasting Costs	15%	100%		\$ 228	\$ 228	\$ -
Market Surveillance Committee	15%	100%		\$ 53	\$ 53	\$ -
Operational Services Total				\$ 281	\$ 281	\$ -
Total Non-ABC Support Costs				\$ 644	\$ 610	\$ 34

Step 2: Applying WEIM Activity Percentages to ABC Direct O&M Costs

The ABC direct O&M costs from *Table 18 – Allocation of ABC Direct Operating Activities to Cost*

Categories - were allocated using the percentages shown in *Table 5 - Mapping of ABC Direct Operating Activities* above.

Table 45 — Allocation of Market Services ABC Direct Operating Costs

ABC Direct Operating Activities		GMC	Market Services Split		Market Services Split		
Code	ABC Level 2 Activities	Market Services	Real-Time Market	Day-Ahead Market	Category Budget	Real-Time Market	Day-Ahead Market
		<i>cost category % allocation</i>	<i>category % allocation</i>		<i>budget allocations (amounts in thousands)</i>		
80001 Develop Infrastructure (DI)							
201	Develop and Monitor Regulatory Contract Procedures	95%	50%	50%	\$ 1,175	\$ 588	\$ 587
	Total DI				\$ 1,175	\$ 588	\$ 587
80002 Develop Markets (DM)							
229	Develop State / Federal Regulatory Policy	40%	50%	50%	\$ 110	\$ 55	\$ 55
230	BPM Change Management	80%	50%	50%	\$ 27	\$ 14	\$ 13
231	Develop Infrastructure Policy	40%	50%	50%	\$ 5,291	\$ 2,646	\$ 2,645
232	Perform Market Analysis	80%	80%	20%	\$ 3,013	\$ 2,410	\$ 603
234	Manage Regulatory Contract Negotiations	95%	50%	50%	\$ 460	\$ 230	\$ 230
	Total DM				\$ 8,901	\$ 5,355	\$ 3,546
80004 Manage Market & Reliability Data & Modeling (MMR)							
301	Manage Full Network Model Maintenance	45%	50%	50%	\$ 2,474	\$ 1,237	\$ 1,237
304	EMAA Telemetry	50%	100%		\$ 511	\$ 511	\$ -
308	Manage Credit & Collateral	40%	50%	50%	\$ 583	\$ 292	\$ 291
309	Resource Management	50%	80%	20%	\$ 833	\$ 666	\$ 167
320	Provide Stakeholder Training	60%	50%	50%	\$ 896	\$ 448	\$ 448
321	Schedule Coordinator Management	45%	80%	20%	\$ 161	\$ 129	\$ 32
322	Register, Modify and Terminate PDR Resource	100%	50%	50%	\$ 56	\$ 28	\$ 28
323	Calculate & Monitor Energy Costs & Indices	60%	80%	20%	\$ 546	\$ 437	\$ 109
331	Operational Requirements	60%	50%	50%	\$ 116	\$ 58	\$ 58
	Total MMR				\$ 6,176	\$ 3,806	\$ 2,370

ABC Direct Operating Activities		Market Services Split		Market Services Split			
Code	ABC Level 2 Activities	GMC	Real-Time	Day-Ahead	Category	Real-Time	Day-Ahead
		Market Services	Market	Market	Budget	Market	Market
		<i>cost category % allocation</i>	<i>category % allocation</i>	<i>category % allocation</i>	<i>budget allocations (amounts in thousands)</i>		
80005 Manage Market & Grid (MMG)							
352	Manage Day-Ahead Market Support	95%		100%	\$ 351	\$ -	\$ 351
353	Operations Real-Time Support	80%	100%		\$ 678	\$ 678	\$ -
355	Outage Model & Management	5%	50%	50%	\$ 191	\$ 96	\$ 95
360	Real-Time Operations	20%	100%		\$ 4,369	\$ 4,369	\$ -
362	Manage Operations Engineering Support	15%	50%	50%	\$ 780	\$ 390	\$ 390
368	Manage Day-Ahead and Market Operations	100%	50%	50%	\$ 2,029	\$ 1,015	\$ 1,014
371	Load Forecast	40%	50%	50%	\$ 586	\$ 293	\$ 293
372	Renewable Forecast	50%	50%	50%	\$ 281	\$ 141	\$ 140
373	Weather Forecast	40%	50%	50%	\$ 64	\$ 32	\$ 32
	Total MMG				\$ 9,329	\$ 7,014	\$ 2,315
	MMG %s				100%	75%	25%
80007 Manage Operations Support & Settlements (MOS)							
401	Perform Market Validation	80%	80%	20%	\$ 226	\$ 181	\$ 45
402	Manage Dispute Analysis & Resolution	100%	80%	20%	\$ 1,437	\$ 1,150	\$ 287
403	Manage Market Quality System	50%	80%	20%	\$ 308	\$ 246	\$ 62
409	Meter Data Acquisition and Processing	100%	50%	50%	\$ 287	\$ 144	\$ 143
411	Manage Market Clearing	45%	50%	50%	\$ 76	\$ 38	\$ 38
412	Manage Market Billing & Settlements	45%	80%	20%	\$ 993	\$ 794	\$ 199
414	Manage Settlements Quarterly Release Cycle	45%	80%	20%	\$ 1,201	\$ 961	\$ 240
417	Perform Market Report	80%	80%	20%	\$ 448	\$ 358	\$ 90
418	Manage Good Faith Negotiation Requests	100%	50%	50%	\$ 17	\$ 9	\$ 8
419	Manage Price Corrections	50%	80%	20%	\$ 797	\$ 638	\$ 159
	Total MOS				\$ 5,790	\$ 4,519	\$ 1,271

ABC Direct Operating Activities		Market Services Split		Market Services Split			
Code	ABC Level 2 Activities	GMC	Real-Time	Day-Ahead	Category	Real-Time	Day-Ahead
		Market Services	Market	Market	Budget	Market	Market
		<i>cost category % allocation</i>	<i>category % allocation</i>		<i>budget allocations (amounts in thousands)</i>		
80008 Plan & Manage Business (PMB)							
455	Manage Technology Collaboration (Internal)	100%	80%	20%	\$ 9,563	\$ 7,650	\$ 1,913
462	Manage Technology Collaboration (External)	100%	50%	50%	\$ 427	\$ 214	\$ 213
80009 Support Business Services (SBS)							
504	IT Application, System, & Non-Production Support	80%	50%	50%	\$ 14,749	\$ 7,375	\$ 7,374
511	IT Incident Management	60%	50%	50%	\$ 3,493	\$ 1,747	\$ 1,746
513	IT Problem & Risk Lifecycle Management	60%	50%	50%	\$ 379	\$ 190	\$ 189
537	Monitor Markets	80%	50%	50%	\$ 2,908	\$ 1,454	\$ 1,454
80010 Support Customers & Stakeholders (SCS)							
601	Manage Client Inquiries	80%	80%	20%	\$ 3,005	\$ 2,404	\$ 601
602	Account Management	80%	80%	20%	\$ 708	\$ 566	\$ 142
603	Manage Stakeholder Processes	80%	20%	80%	\$ 1,791	\$ 358	\$ 1,433
609	Manage External Affairs				\$ -	\$ -	\$ -
610	Manage Communications & Public Relations				\$ -	\$ -	\$ -
	Total SCS				\$ 5,504	\$ 3,328	\$ 2,176
	Total Direct O&M				\$ 68,394	\$ 43,240	\$ 25,154
	Direct O&M %				100%	63%	37%

Table 46 — Allocation of System Operations ABC Direct Operating Costs

ABC Direct Operating Activities		System Operations Split		System Operations Split			
Code	ABC Level 2 Activities	GMC System Operations	Real-Time Dispatch	BA Services	Category Budget	Real-Time Dispatch	BA Services
		<i>cost category % allocation</i>	<i>category % allocation</i>		<i>budget allocations (amounts in thousands)</i>		
80001 Develop Infrastructure (DI)							
202	Manage Generator Interconnection Agreements	100%		100%	\$ 419	\$ -	\$ 419
203	Manage Generator Interconnection Process	100%		100%	\$ 4,190	\$ -	\$ 4,190
204	Manage Long Term Transmission Planning	100%		100%	\$ 5,985	\$ -	\$ 5,985
205	Manage New Transmission Resources	95%		100%	\$ 658	\$ -	\$ 658
206	Manage Transmission Maintenance Standards	100%		100%	\$ 328	\$ -	\$ 328
207	Manage Load Resource Data	100%		100%	\$ 308	\$ -	\$ 308
208	Seasonal Assessment	100%		100%	\$ 261	\$ -	\$ 261
209	Manage Queue Management	100%		100%	\$ 605	\$ -	\$ 605
	Total DI				\$ 12,754	\$ -	\$ 12,754
80002 Develop Markets (DM)							
229	Develop State / Federal Regulatory Policy	60%		100%	\$ 165	\$ -	\$ 165
230	BPM Change Management	10%	100%		\$ 3	\$ 3	\$ -
231	Develop Infrastructure Policy	60%		100%	\$ 7,936	\$ -	\$ 7,936
232	Perform Market Analysis	15%	100%		\$ 565	\$ 565	\$ -
	Total DM				\$ 8,669	\$ 568	\$ 8,101
80004 Manage Market & Reliability Data & Modeling (MMR)							
301	Manage Full Network Model Maintenance	45%	100%		\$ 2,474	\$ 2,474	\$ -
302	Plan & Develop Operations Simulator Training	95%	100%		\$ 366	\$ 366	\$ -
304	EMAA Telemetry	50%	20%	80%	\$ 511	\$ 102	\$ 409
308	Manage Credit & Collateral	40%	50%	50%	\$ 584	\$ 292	\$ 292
309	Resource Management	50%	50%	50%	\$ 834	\$ 417	\$ 417
310	Manage Reliability Requirements	100%		100%	\$ 1,098	\$ -	\$ 1,098
311	Manage Operations Planning	95%	20%	80%	\$ 1,697	\$ 339	\$ 1,358
312	Manage WECC Studies	100%	20%	80%	\$ 130	\$ 26	\$ 104
314	Manage & Facilitate Procedure Maintenance	95%	20%	80%	\$ 226	\$ 45	\$ 181
316	Plan & Develop Operations Training	95%	100%		\$ 2,653	\$ 2,653	\$ -
317	Execute & Track Operations Training	95%	100%		\$ 1,191	\$ 1,191	\$ -
320	Provide Stakeholder Training	30%	50%	50%	\$ 449	\$ 225	\$ 224
321	Schedule Coordinator Management	45%	20%	80%	\$ 161	\$ 32	\$ 129
323	Calculate & Monitor Energy Costs & Indices	35%	100%		\$ 319	\$ 319	\$ -
331	Operational Requirements	40%	50%	50%	\$ 77	\$ 39	\$ 38
	Total MMR				\$ 12,770	\$ 8,520	\$ 4,250

ABC Direct Operating Activities		System Operations Split		System Operations Split			
Code	ABC Level 2 Activities	GMC	Real-Time Dispatch	BA Services	Category Budget	Real-Time Dispatch	BA Services
		System Operations	category % allocation		budget allocations (amounts in thousands)		
80005 Manage Market & Grid (MMG)							
353	Operations Real-Time Support	15%	100%		\$ 127	\$ 127	\$ -
355	Outage Model & Management	60%	20%	80%	\$ 2,290	\$ 458	\$ 1,832
360	Real-Time Operations	80%	50%	50%	\$ 17,476	\$ 8,738	\$ 8,738
362	Manage Operations Engineering Support	80%	100%		\$ 4,161	\$ 4,161	\$ -
367	Manage Operations Compliance & Event Analysis	50%		100%	\$ 321	\$ -	\$ 321
371	Load Forecast	50%	50%	50%	\$ 733	\$ 367	\$ 366
372	Renewable Forecast	50%	80%	20%	\$ 282	\$ 226	\$ 56
373	Weather Forecast	50%	50%	50%	\$ 79	\$ 40	\$ 39
80007 Manage Operations Support & Settlements (MOS)							
401	Perform Market Validation	20%	100%		\$ 57	\$ 57	\$ -
403	Manage Market Quality System	40%	100%		\$ 247	\$ 247	\$ -
411	Manage Market Clearing	45%	50%	50%	\$ 75	\$ 38	\$ 37
412	Manage Market Billing & Settlements	45%	100%		\$ 992	\$ 992	\$ -
414	Manage Settlements Quarterly Release Cycle	45%	100%		\$ 1,201	\$ 1,201	\$ -
417	Perform Market Report	20%	100%		\$ 112	\$ 112	\$ -
419	Manage Price Corrections	40%	100%		\$ 638	\$ 638	\$ -
80009 Support Business Services (SBS)							
504	IT Application, System, & Non-Production Support	15%	50%	50%	\$ 2,766	\$ 1,383	\$ 1,383
511	IT Incident Management	30%	100%		\$ 1,746	\$ 1,746	\$ -
513	IT Problem & Risk Lifecycle Management	30%	100%		\$ 190	\$ 190	\$ -
80010 Support Customers & Stakeholders (SCS)							
601	Manage Client Inquiries	10%	100%		\$ 376	\$ 376	\$ -
602	Account Management	10%	100%		\$ 89	\$ 89	\$ -
603	Manage Stakeholder Processes	10%	100%		\$ 224	\$ 224	\$ -
Total SCS					\$ 689	\$ 689	\$ -
Total Direct O&M					\$ 68,375	\$ 30,498	\$ 37,877
Direct O&M %					100%	45%	55%

Step 3: Allocating the Remaining Revenue Requirement Components

The other revenue from *Table 23 – Allocation of Other Revenue to Cost Categories* - were allocated using the percentages shown in the *Table 9 – Mapping of Other Revenue* above.

Table 47 — Allocation of Market Services Other Revenue

Other Costs and Revenue		Market Services Split		Market Services Split		
Component	GMC	Real-Time	Day-Ahead	Category	Real-Time	Day-Ahead
	Market Services	Market	Market	Budget	Market	Market
		<i>cost category % allocation</i>		<i>budget allocations (amounts in thousands)</i>		
Other Costs and Revenue						
Nodal Pricing Model Fee	50%	50%	50%	\$ 4,200	\$ 2,100	\$ 2,100
Intermittent Resource Forecasting Fees	80%	100%		\$ 4,400	\$ 4,400	\$ -
Total Other Costs and Revenue				\$ 8,600	\$ 6,500	\$ 2,100

Table 48 — Allocation of System Operations Other Revenue

Other Costs and Revenue		System Operations Split		System Operations Split		
Component	GMC	Real-Time	BA	Category	Real-Time	BA
	System Operations	Dispatch	Services	Budget	Dispatch	Services
		<i>cost category % allocation</i>		<i>budget allocations (amounts in thousands)</i>		
Other Costs and Revenue						
Nodal Pricing Model Fee	50%	100%		\$ 4,200	\$ 4,200	\$ -
Intermittent Resource Forecasting Fees	15%	100%		\$ 825	\$ 825	\$ -
Generator Interconnection Project Fees and Application Fees	100%		100%	\$ 2,000	\$ -	\$ 2,000
California-Oregon Intertie (COI) Path Operator Fees	100%		100%	\$ 700	\$ -	\$ 700
Planning Coordinator Fees	100%		100%	\$ 110	\$ -	\$ 110
Total Other Costs and Revenue				\$ 7,835	\$ 5,025	\$ 2,810

Step 4: Aggregating Revenue Requirement into Cost Categories and Allocating Fees

The indirect costs were allocated to the cost categories based on the cost category's total direct costs as illustrated below. As a final step, the fees collected as part of the GMC were deducted from the cost categories portion to collect.

Table 49 — Mapping Revenue Requirement to Cost Categories

Modified GMC Revenue Requirement		Market Services Split			System Operations Split		
Component	Budget	Market Services	Real-Time Market	Day-Ahead Market	System Operations	Real-Time Dispatch	BA Services
Non-ABC O&M Support Costs	\$ 39,043	\$ 2,063	\$ 1,941	\$ 122	\$ 644	\$ 610	\$ 34
Direct ABC O&M Costs	\$ 212,322	\$ 68,394	\$ 43,240	\$ 25,154	\$ 68,375	\$ 30,498	\$ 37,877
Debt Service	\$ 14,685	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Cash Funded Capital	\$ 15,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other Costs and Revenues	\$ (54,680)	\$ (8,600)	\$ (6,500)	\$ (2,100)	\$ (7,835)	\$ (5,025)	\$ (2,810)
Operating Costs Reserve Adjustment	\$ (13,493)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 212,877	\$ 61,857	\$ 38,681	\$ 23,176	\$ 61,184	\$ 26,083	\$ 35,101
Indirect Costs	\$ 7,057	\$ 45,715	\$ 28,587	\$ 17,128	\$ 45,715	\$ 19,488	\$ 26,227
GMC Revenue Requirement Before Fees	\$ 219,934	\$ 107,572	\$ 67,268	\$ 40,304	\$ 106,899	\$ 45,571	\$ 61,328
Less Fees	\$ (13,168)	\$ (11,107)	\$ (4,220)	\$ (6,888)	\$ (1,006)	\$ (1,006)	\$ -
Remaining Revenue Requirement to Collect	\$ 206,766	\$ 96,465	\$ 63,049	\$ 33,416	\$ 105,893	\$ 44,565	\$ 61,328
			65%	35%		42%	58%

Step 5: Calculation of the WEIM Components of the 2022 Cost Category Rates

The percentages from Table 45 were applied to the cost categories' real-time component's rate from *Table 27 – 2022 GMC Rates Using Revised Cost Category Percentages*.

Table 50 — Calculation of the WEIM Components

Cost Category	Category Net Costs	Pro Forma Rate	EIM Real-Time Activity	EIM Percentage of Costs	EIM Cost of Real-Time Activities	EIM Pro Forma Rate
	<i>(\$ in thousands)</i>	<i>(\$ / MWh)</i>			<i>(\$ in thousands)</i>	<i>(\$ / MWh)</i>
Market Services	\$ 96,465	\$ 0.1809	Real-Time Market	65%	\$ 63,049	\$ 0.1182
System Operations	\$ 105,893	\$ 0.2403	Real-Time Dispatch	42%	\$ 44,565	\$ 0.1011

Summary of WEIM Cost Category Percentage Changes

A comparison of the WEIM cost category percentages from the 2020 and 2023 Cost-of-Service studies is highlighted below. The study results indicate a shift of WEIM related resources. The study shows that 2% of the Market Services' resources shifted from the Day-Ahead Market functions to the Real-Time Market functions, while 8% of the System Operations' resources shifted from the Real-Time Dispatch functions to the Balancing Authority functions as a result of the Nodal Pricing Model revenue offsetting System Operations Real-Time Dispatch costs.

Table 51 — Summary of WEIM Cost Category Percentage Changes

Cost Category	Sub-Category	2019 Study Effective 2021 GMC	2022 Study Effective 2024 GMC	Change from Prior
Market Services	Real-Time Market	63%	65%	2%
	Day-Ahead Market	37%	35%	-2%
System Operations	Real-Time Dispatch	50%	42%	-8%
	Balancing Authority	50%	58%	8%

Supplemental Services

As another focus of the 2023 Cost-of-Service study, the CAISO analyzed the efforts that support other supplemental services. This effort required input from the various groups that support the services, such as from the Contracts, Contract and Model Implementation, Market Services, Operations Planning, Credit, and Customer Service groups.

The study results indicate resources to support TOR efforts have increased due to higher support costs and lower volumes. The TOR Charge will increase from \$0.18 per MWh to \$0.32 per MWh in 2024 and to \$0.33 per MWh in 2025 (see Appendix A, Schedule 4 for the 2025 calculation). CAISO does not propose any changes to other supplemental fee amounts.

The revenue collected from the fees offset the costs recovered through either the GMC revenue requirement or the GMC rates.

Table 52 — Supplemental Fees

Fee	Billing Units	Current Fee	Updated Fee eff. 1/1/2024	Updated Fee eff. 1/1/2025
Bid Segment Fee	per bid segment	\$ 0.0050	No Change	No Change
Inter SC Trade Fee	per Inter SC Trade	\$ 1.0000	No Change	No Change
Scheduling Coordinator ID Fee	per month	\$ 1,500	No Change	No Change
TOR Charge	minimum of supply or demand TOR MWh	\$ 0.1800	\$ 0.3200	\$ 0.3300
CRR Bid Fee	number of nominations and bids	\$ 1.00	No Change	No Change
Intermittent Resource Forecasting Fee	per MWh	\$ 0.1000	No Change	No Change
Scheduling Coordinator Application Fee	per application	\$ 7,500	No Change	No Change
CRR Application Fee	per application	\$ 5,000	No Change	No Change
HANA Administrative Fee	annual fee	\$ 45,000	No Change	No Change
HANA Setup Fee	one time fee	\$ 35,000	No Change	No Change

Transmission Ownership Rights

Transmission Ownership Rights (TOR) represent transmission capacity on facilities that are located within the CAISO balancing authority area that are either wholly or partially owned by an entity that is not a participating transmission owner.

The following four services are required for TOR:

1. Real-Time Operations: The CAISO provides support on an emergency basis for flows on TOR, in a manner similar to standby service.
2. Scheduling: The CAISO provides check-outs with neighboring balancing authorities (BA) to schedule flows across boundaries.
3. Outage Management: The CAISO provides for the scheduling and coordination of outages across the BA.
4. Settlements: The CAISO utilizes its settlements system and processes to charge TOR fees.

Application of ABC to TOR Charge Structure

TORs utilize the ABC level 2 activities identified in the table below. These activities are all related to system operations as there is no TOR participation in the market and thus market services costs are not applicable.

Table 53 — ABC Direct Operating Activities for TORs

Transmission Ownership Rights (TOR) Charge		
ABC Code	Task Code	ABC Level 2 Activity
80004	301	Manage Full Network Model (FNM) Maintenance
80004	311	Manage Operations Planning
80004	312	Manage WECC Studies
80005	355	Manage Outages
80005	360	Real-Time Operations
80005	362	Manage Operations Engineering Support
80007	411	Manage Market Clearing
80007	412	Manage Market Billing & Settlements

Mapping and Costing of Cost Categories to TOR Activities

Using the process described below, a total of \$51.2 million in direct and indirect costs were allocated to TORs. The CAISO reached this conclusion by identifying the costs for the specific level 2 activities from the 2022 Cost-of-Service update. The indirect dollars were then allocated based on the direct percentage. A table summarizing the cost of TORs is as follows

Table 54 — Calculation of TOR Related Costs

Transmission Ownership Rights (TOR) Charge			
ABC Code	Task Code	ABC Level 2 Activity	Amount (\$ in thousands)
80004	301	Manage Full Network Model (FNM) Maintenance	\$ 2,474
80004	311	Manage Operations Planning	\$ 1,697
80004	312	Manage WECC Studies	\$ 130
80005	355	Manage Outages	\$ 2,290
80005	360	Real-Time Operations	\$ 17,476
80005	362	Manage Operations Engineering Support	\$ 4,161
80007	411	Manage Market Clearing	\$ 75
80007	412	Manage Market Billing & Settlements	\$ 992
Applicable Direct Costs			\$ 29,295
Total System Operations Direct Costs			\$ 61,184
Percentage of TORs to System Operations Direct Costs			48%
Total System Operations Indirect Costs			\$ 45,715
Percentage Per Above			48%
Applicable Indirect Costs			\$ 21,943
Total TOR Related Costs			\$ 51,238

System Operation’s indirect costs were allocated based on the percentage of direct cost as shown above. Then the ratio of TOR MWh to the total system operations (flow) MWh was calculated to determine the usage percentage.

Table 55 — TORs as a Percentage of Gross Volumes

TOR Flow	
	Volumes (in MWh)
System Operations Volume	451,126,859
Add Back Grandfathered Contracts	-
TOR Supply	3,995,153
TOR Demand	3,252,441
Total Adjusted System Operations Volume	458,374,453
Total Gross TOR Volume (Supply and Demand)	7,247,594
TOR as a Percentage of Gross Volume	2.00%

The amount to collect is then derived by multiplying the TOR related costs by the TOR percentage results. The TOR Charge is then determined by dividing the TOR costs to collect by the minimum of actual TOR supply or actual TOR demand for 2022. The revised TOR Charge is as follows.

Table 56 — Calculation of TOR Charge

TOR Fee Calculation	
	Amount
Total Applicable Direct and Indirect Costs	\$ 51,238,008
TOR as a Percentage of Gross Volume	2.00%
TOR Costs to Collect	\$ 1,024,760
TOR MWh for 2022 (min. of supply and demand)	3,252,441
TOR Charge per MWh	\$ 0.3200

Summary of TOR Charge Changes

The study results indicate resources to support TOR efforts have increased due to higher support costs and lower volumes. The TOR Charge will increase from \$0.18 per MWh to \$0.32 per MWh in 2024 and to \$0.33 per MWh in 2025. The revenue collected from the TOR Charge offsets the System Operations Real-Time Dispatch costs, which lowers the System Operations Real-Time Dispatch Charge.

Table 57 — Summary of TOR Charge Changes

Transmission Ownership Rights (TOR) Charge	Prior COSS	Current COSS	Increase / (Decrease) From Prior
TOR Fee Calculation			
	<u>Amount</u>	<u>Amount</u>	<u>Amount</u>
Total Applicable Direct and Indirect Costs	\$ 38,793,480	\$ 51,238,008	\$ 12,444,528
TOR as a Percentage of Gross Volume	2.00%	2.00%	0.00%
TOR Costs to Collect	\$ 775,870	\$ 1,024,760	\$ 248,890
TOR MWh for 2022 (min. of supply and demand)	4,313,917	3,252,441	(1,061,477)
TOR Charge per MWh	\$ 0.1800	\$ 0.3200	\$ 0.1400

Extended Day-Ahead Market

On February 1, 2023, the CAISO Board of Governors and the WEIM Governing Body approved the design of an Extended Day Ahead Market (EDAM) across the West. The EDAM builds upon the significant benefits of collaboration derived through the WEIM, and enables WEIM entities to extend participation to the day-ahead market. Currently, WEIM entities are subject to the WEIM Administrative Charge that includes the charges for the real-time market services and real-time dispatch services WEIM entities receive while participating in the energy imbalance market. Through participation in the EDAM, the CAISO will provide a broader set of market services across the day-ahead and real-time markets. In the EDAM initiative, the CAISO proposed to utilize the existing GMC rate design to establish EDAM administrative fees to ensure EDAM participants and existing CAISO customers benefit from the stability and disciplined growth of our annual GMC Revenue Requirement.³ The

³ Extended Day-Ahead Market Final Proposal, section II.E (December 7, 2022).

EDAM administrative fees, similar to the WEIM administrative fees, follow cost causation and other relevant ratemaking principles. In addition, EDAM participants will reimburse the CAISO for costs incurred by the CAISO to onboard the EDAM entity.

The EDAM administrative fees will consist of the existing Market Services Charge and the new System Operations Real-Time Dispatch Charge as introduced in this study, both volumetric charges. The Market Services Charge represents fees for the real-time market and the day-ahead market services that EDAM offers, and applies to awarded MWh of energy and MW of capacity. The calculation of the Market Services portion of the annual GMC Revenue Requirement amount to collect will be based on the latest Cost-of-Service study results. The GMC Revenue Requirement will be multiplied by the latest study's Market Services cost category percentage to determine the cost to collect. The cost will be divided by the projected total day-ahead, 15-minute market, real-time dispatch, and instructed imbalance energy MWh volumes to determine the annual Market Services Charge per MWh.

The Systems Operations Real-Time Dispatch Charge will represent the costs to support real-time dispatch services that the CAISO offers to its BAA customers as well as to its WEIM and EDAM customers, and it applies to metered flows in MWh of supply and demand. The calculation of the amount to collect for System Operations Real-Time Dispatch portion of the annual GMC Revenue Requirement will be based on the latest Cost-of-Service study results. The GMC Revenue Requirement will be multiplied by the latest study's System Operations Real-Time Dispatch cost category percentage to determine the cost to collect. To determine the price per MWh, the cost will be divided by the projected total generation, import, load and export (gross meter) MWh volumes; total volumes include the CAISO BAA, WEIM, and EDAM participants.

As experienced through the growth of the WEIM, as participation in the EDAM grows the increase in volumes will contribute to lower the Market Services Charge and the System Operations Real-Time Dispatch Charge for all market participants, all other factors held constant. This also contributes to lower WEIM administrative fees. All customers receiving Market Services, including the CAISO BAA, will benefit from a lower Market Services Charge when EDAM becomes operational because the Market Services charge will be calculated using the incremental day-ahead MWh volumes (load and supply) from EDAM participants, spreading the cost of CAISO operations across a wider MWh volumes.

EDAM Transitional Load Ramp-In

Broader participation in the EDAM will reduce the Market Services Charges for all CAISO market participants due to the additional supply and demand volumes participating in the market as has been the case with broadening participation in the WEIM. The lower Market Services Charge reduces the costs of participation in the market overall and is an additional benefit of broader market participation. However, at an individual EDAM entity level, extension of participation from the WEIM to the EDAM will represent an increase in administrative fees for that individual entity compared to the WEIM administrative fees the entities incurs today due to the additional day-ahead market service it will be provided. These increased administrative fees can significantly impact the cost/benefit analysis of extending participation to the EDAM for a particular entity and can be a barrier to market entry, while participation in the EDAM provides a benefit for the broader market participants by contributing to the reduction of the Market Services Charge. As the EDAM footprint gradually grows with additional participants over time, it further reduces the Market Services Charge to the benefit of all the CAISO market participants, WEIM entities, and EDAM entities.

The CAISO has considered methods for reducing the initial impact of the increased costs that WEIM entities extending participation to the EDAM will experience due to the increased administrative fees for the additional day-ahead services provided. At the same time, consideration of methods of reducing the EDAM administrative fee should nevertheless be balanced against the impact on the resulting GMC rates that the CAISO load pays comparatively today. Reducing the administrative fees during the initial period of EDAM operation is critical to supporting introduction and growth of the EDAM, which will reduce GMC rates for all market participants due to the additional supply and demand participating in the market. A reduction in the administrative fees can incent early participation in the EDAM while still providing benefits in the reduction of Market Services Charge for all market participants.

With the above challenge in mind, the CAISO is proposing a transitional ramp-in of load-based charges that will be offered during the initial four years of EDAM operations. This ramp-in would only apply to load volumes and not to supplier volume based charges to avoid providing any suppliers with a competitive advantage in the market. Under the ramp-in model, the load-based costs start with load effectively paying what is paid today under the WEIM and then the costs would increase equivalent to full load-based charges over four years. The basis of the load-based ramp-in level would be determined by the year the EDAM participant joins. For example,

the following is the ramp-in load-based charges the EDAM entity will be subject to under the ramp-in approach, by year: Year 1 (5%), Year 2 (25%), Year 3 (50%), and Year 4 (75%). The load ramp-in are fixed percentages based on the year of EDAM operations, not EDAM participation. The 5% load ramp-in is intended to collect at least what is being collected under WEIM administrative charges for load today. EDAM participants that join in year one will effectively receive load-based GMC charges at the level of their WEIM participation for their first year. An EDAM participant that joins during EDAM's third year of operation will be eligible for 50% ramp-in of its full load-based charges. And finally, an EDAM participant that joins in year 5 or later will be charged based on its full load-based charges the year it starts.

The supply-based charges will be fully recovered by EDAM participants from the start and is similar in comparison to any resource inside the CAISO. Only the load-based charges are proposed to be ramped in over the first four-years of EDAM, in part because load is not exercising all the services California load is using. For example, by design, EDAM does not initially cover ancillary services, convergence bidding nor make use of congestion revenue rights and therefore EDAM entity load will not have the same access to all these services as the California load will. Finally, EDAM has not been tried before and is incremental to the WEIM. Therefore, the model was developed as a solution that scales the load-based costs with the expected growth in the use and benefits as a function over time as other EDAM entities join and participate growing the utility of the EDAM for California and early adopters of the EDAM.

If the CAISO required all EDAM load to pay all load charges from year one then it may impede the early start-up of EDAM and doing so would ultimately deny or delay existing California entities early GMC cost reduction and operational benefits of EDAM. This model incentivizes early adoption and immediately benefits all existing CAISO customers by reducing the costs of service for all Market Services and System Operations Real-Time Dispatch customers.

The following table illustrates the transitional load ramp-in effect on revenue contributions by participants assuming PacifiCorp's participation⁴ in EDAM effective year 1 of operation. The annual revenue contribution assumes the 2023 Cost-of-Service study cost category percentage allocations, the 2022 modified revenue

⁴PacifiCorp announced its plan to join EDAM 12/8/2022, <https://www.pacificorp.com/about/newsroom/news-releases/EDAM-innovative-efforts.html>

requirement used in the study, and a 3% year-over-year revenue requirement for inflationary growth for years 2026 through 2029.

Table 58 — Scenario Comparison with PacifiCorp

Projected Market Services (DA and RT) and System Operations (RTD) Revenue Contributions						
(\$ in millions)						
Scenario	2025	2026	2027	2028	2029	
Base: No EDAM Participation						
CAISO (inclusive of RC funding requirement contribution impacts)	\$ 160.5	\$ 165.3	\$ 170.3	\$ 175.4	\$ 180.7	
PAC (existing WEIM and NPM Charges)	\$ 12.9	\$ 12.9	\$ 13.3	\$ 13.3	\$ 13.3	
Revenue Contributions	\$ 173.4	\$ 178.2	\$ 183.6	\$ 188.7	\$ 194.0	
Scenario 1a: Only CAISO and PAC (Yrs 1-5) w/o Load Volume Ramp-In						
CAISO's portion of the charges	\$ 125.8	\$ 129.5	\$ 133.4	\$ 137.4	\$ 141.6	
PAC's portion of the charges	\$ 47.7	\$ 49.1	\$ 50.6	\$ 52.1	\$ 53.7	
Revenue Contributions	\$ 173.4	\$ 178.6	\$ 184.0	\$ 189.5	\$ 195.2	
Scenario 1b: Only CAISO and PAC (Yrs 1-5) w/Load Volume Ramp-In						
	EDAM Load Volume Ramp-In	5%	25%	50%	75%	100%
CAISO's portion of the charges	\$	139.4	\$ 140.0	\$ 140.1	\$ 140.6	\$ 141.6
PAC's portion of the charges	\$	34.0	\$ 38.7	\$ 43.9	\$ 48.9	\$ 53.7
Revenue Contributions	\$	173.4	\$ 178.6	\$ 184.0	\$ 189.5	\$ 195.2
Reduction in CAISO charges from Base	\$	21.1	\$ 25.4	\$ 30.2	\$ 34.8	\$ 39.1
PacifiCorp's Scenario 1b ramp-in compared to what they would be charged for full supply and load (Scenario 1a) from year 1.		29%	21%	13%	6%	0%

Table 58 - Scenario Comparison with PacifiCorp above provides a detailed comparison of the Market Services and System Operations Real-Time Dispatch revenue requirements comparing a base scenario of no EDAM participation with a scenario in which PacifiCorp participates in the EDAM (with (Scenario 1b) and without (Scenario 1a) the proposed load-based ramp-in). In combining the ramped-in load-based charges with the supply based charges, PacifiCorp could expect a ramp-in of Year 1 (71%), Year 2 (79%), Year 3 (87%), Year 4 (94%), and Year 5 (100%) when compared to what the total load and supply based costs would have been without proposed load-based ramp-in. This ramp-in reflects the CAISO's costs and load customers' benefits, and the fact that EDAM entities joining the Day-Ahead Market also pay new entrant fees that go directly to their specific early implementation costs.

As another example, Table 59 - Scenario Comparison with PacifiCorp and another WEIM Entity below provides a detailed comparison of the Market Services and System Operations Real-Time Dispatch revenue requirements comparing a base scenario of no EDAM participation with a scenario in which PacifiCorp and another WEIM entity participates in the EDAM (with (Scenario 1b) and without (Scenario 1a) the proposed load-

based ramp-in). In combining the ramped-in load-based charges with the supply based charges, PacifiCorp and the other entity could expect a ramp-in of Year 1 (70%), Year 2 (79%), Year 3 (85%), Year 4 (94%), and Year 5 (100%) when compared to what the total load and supply based costs would have been without proposed load-based ramp-in [the results are similar to Table 58's results]. Note that the change in the Year 1 through Year 5 revenue contributions is different due to the RC funding requirement impacts.

Table 59 — Scenario Comparison with PacifiCorp and another WEIM Entity

Projected Market Services (DA and RT) and System Operations (RTD) Revenue Contributions						
(\$ in millions)						
Scenario	Year 1 Charges	Year 2 Charges	Year 3 Charges	Year 4 Charges	Year 5 Charges	
Base: No EDAM Participation						
CAISO (inclusive of RC funding requirement contribution impacts)	\$ 160.4	\$ 165.7	\$ 171.1	\$ 176.6	\$ 182.3	
PAC (existing EIM and NPM Charges)	\$ 12.9	\$ 12.9	\$ 12.9	\$ 12.9	\$ 12.9	
Other Entity (existing EIM)	\$ 1.4	\$ 1.4	\$ 1.4	\$ 1.4	\$ 1.4	
Revenue Contributions	\$ 174.7	\$ 180.0	\$ 185.4	\$ 190.9	\$ 196.6	
Scenario 1a: Only CAISO, PAC, and Other Entity (Yrs 1-5) w/o Load Volume Ramp-In						
CAISO's portion of the charges	\$ 114.0	\$ 117.4	\$ 120.9	\$ 124.5	\$ 128.3	
PAC's portion of the charges	\$ 43.2	\$ 44.6	\$ 45.9	\$ 47.3	\$ 48.6	
Other Entity's portion of the charges	\$ 17.5	\$ 18.0	\$ 18.6	\$ 19.1	\$ 19.7	
Revenue Contributions	\$ 174.7	\$ 180.0	\$ 185.4	\$ 190.9	\$ 196.6	
Scenario 1b: Only CAISO, PAC, and Other Entity (Yrs 1-5) w/Load Volume Ramp-In						
	EDAM Load Volume Ramp-In	5%	25%	50%	75%	100%
CAISO's portion of the charges	\$	132.1	\$ 130.8	\$ 125.7	\$ 128.4	\$ 128.3
PAC's portion of the charges	\$	31.1	\$ 35.5	\$ 39.2	\$ 44.6	\$ 48.6
Other Entity's portion of the charges	\$	11.5	\$ 13.7	\$ 15.4	\$ 17.9	\$ 19.7
Revenue Contributions	\$	174.7	\$ 180.0	\$ 180.3	\$ 190.9	\$ 196.6
Reduction in CAISO charges from Base	\$	28.3	\$ 34.9	\$ 45.4	\$ 48.2	\$ 54.0
PacifiCorp's and Other Entity's Scenario 1b discount compared to what they would be charged for full supply and load (Scenario 1a) from year 1.		30%	21%	15%	6%	0%

Under the proposed EDAM transitional load ramp-in approach described above, there is nevertheless a benefit to CAISO BAA customers and WEIM entities. Because the ramp-in reduction in EDAM administrative fees applies to only load-based charges, EDAM entities will continue to be subject to full supply based GMC charges, which helps reduce the Market Services Charge and the System Operations Real-Time Dispatch Charge. As the ramp-in period progresses from Year 1 to Year 5, and EDAM entities ramp-in toward full assessment of EDAM administrative fees, the reduction in GMC charges to the CAISO BAA and other market participants increases as

well. The CAISO believes the transitional load ramp-in model is a just and reasonable model for aligning the costs with benefits of the EDAM services that will grow with increased participation. EDAM does not initially cover ancillary services, convergence bidding nor make use of congestion revenue rights and therefore EDAM entity load will not have the same access to all these services as the California load will. Additionally, the incentive of the ramp-in model for early adoption increases the overall benefit for California entities.

Revenue Requirement Cap

The CAISO proposes to retain the same process currently included in the tariff with respect to the GMC Revenue Requirement cap so that as long as the CAISO's annual budget for each year does not exceed that year's cap, and there are no GMC rate design or billing determinant modifications proposed for the next year, the CAISO will not be required to make a Section 205 filing with FERC seeking approval for the proceeding year's revenue requirement.

The GMC Revenue Requirement cap was last increased in 2015 to \$202 million and since that time, the CAISO has experienced greater growth in other offsetting revenue categories versus the growth in expenses. This has kept the net revenue requirement beneath the cap for nine years and is expected to be sufficient for the 2024 revenue requirement as well. However, beginning in 2025, primarily due to an accounting change on how the CAISO will treat the incoming EDAM revenues and structure the revenue requirement, the projected revenue requirement will substantially exceed the \$202 million cap. The table below displays a summary of the actual revenue requirement the last three-years and the projected revenue requirement for the three-year period of 2024 through 2026.

Table 60 — Forecasted 2024 through 2026 GMC Revenue Requirement

GMC Revenue Requirement (\$ in millions)	Actual			Forecast		
	2021	2022	2023	2024	2025	2026
Operations and Maintenance Budget	\$ 200.8	\$ 210.7	\$ 238.4	\$ 251.9	\$ 258.4	\$ 265.2
Debt Service and Cash Funded Capital	\$ 44.9	\$ 44.7	\$ 35.7	\$ 20.7	\$ 29.7	\$ 29.7
Other Revenues and Adjustments	\$ (63.7)	\$ (72.8)	\$ (74.4)	\$ (70.7)	\$ (46.5)	\$ (46.8)
Total GMC Revenue Requirement	\$ 182.0	\$ 182.6	\$ 199.7	\$ 201.9	\$ 241.6	\$ 248.1
Estimated Measured Demand in TWh	237.3	233.5	234.2	242.5	340.5	346.1
Pro-Forma Bundled Cost per MWh	\$0.7670	\$0.7820	\$0.8527	\$0.8326	\$0.7095	\$0.7168

The forecasted increase in the revenue requirement in 2025 includes some normal cost inflation in operating costs, however it also includes a substantial decrease in offsetting revenues and adjustments. The decline is the result of several factors including the assumption that PacifiCorp joins the EDAM and therefore, ceases payment on the Nodal Pricing Model service and the WEIM service, as those services will be included in EDAM. EDAM revenues will not be treated as an “Other Revenue” as this service will align in both scope and magnitude to the CAISO’s core service offerings. Furthermore, as part of this initiative, the CAISO is proposing the separation of the Systems Operations charge code into two separate charges, one for BAA Services and one for Real-Time Dispatch services. WEIM and EDAM customers will only pay the Real-Time Dispatch Charge, however, this will be collected as part of normal GMC collections and not classified as an “Other Revenue”. Finally, the decline in Other Revenue and Operating Costs Reserve Adjustments assumes a more normal offset from the annual true up of actual revenue and expenses as the higher credits driven by the cost savings experienced during the pandemic years dissipates.

The result of these accounting and structure changes forecasts a GMC Revenue Requirement of \$241.6 million in 2025 and \$248.1 million in 2026. However, the positive impact of the launch of EDAM and the modification of the collection of the System Operations portion of the WEIM can be seen in the growth in the estimated measured demand volume numbers in the table above. Despite the increase in the net revenue requirement, the estimated cost per MWh metric declines from the low 80-cent range to the low 70-cent range. Those numbers will improve with each new addition to the EDAM.

In conclusion, the CAISO is proposing no change in the revenue requirement cap for 2024, an increase to \$245 million in 2025, and an increase to \$250 million in 2026. It is assumed that the CAISO would need additional cap increases beyond 2026; however, those needs will be assessed as part of the normal cycle of the triennial Cost-of-Service study.

Appendix A: Analysis of 2025 and 2026 GMC Revenue Requirement

This section of the study provides the supporting documentation for scenario two's analysis, which impacts the 2025 and 2026 GMC Revenue Requirement. The Operations and Maintenance, Debt Service, and Cash Funded Capital portions of the 2024 thru 2026 Revenue Requirements used in the analyses are similar. Therefore, the supporting documentation in Appendix A will only cover the other areas that will be different in 2025 and 2026 such as Other Costs and Revenues, Operating Costs Reserve Adjustment, the bifurcation of the Systems Operations Charge, and the resulting GMC Revenue Requirement cost category percentage allocations and charges - as well as those for RC, WEIM, and other supplemental fees. The percentage allocations for the new System Operations Real-Time Dispatch cost category and the new System Operations Balance Authority Areas Services cost category follow the same percentage allocation process as the WEIM System Operations allocation process. The table numbering mirrors the same as in the body of the study to help with the contextual understanding of the changes.

Table 11b — 2022 Modified GMC Revenue Requirement Components

Modified GMC Revenue Requirement (\$ in thousands)		
	Scenario 1	Scenario 2
Components	Modified Budget for 2024 Operations	Modified Budget for 2025 + 2026 Operations
Operations and Maintenance	\$ 258,422	\$ 258,422
Debt Service	\$ 14,685	\$ 14,686
Cash Funded Capital	\$ 15,000	\$ 15,000
Other Costs and Revenues	\$ (54,680)	\$ (39,930)
Operating Costs Reserve Adjustment	\$ (13,493)	\$ (5,468)
Total	\$ 219,934	\$ 242,710

Schedule 1: Application of Activity Based Costing

Table 23b — Allocation of Other Revenue to Cost Categories

Other Costs and Revenue												
Component	GMC					GMC						
	Market Services	NEW System	NEW System	CRR Services	Reliability Coordinator	Indirect	Market Services	NEW System	NEW System	CRR Services	Reliability Coordinator	Indirect
		Operations-Real-Time	Operations-Balance					Operations-Real-Time	Operations-Balance			
<i>cost category % allocation</i>						<i>budget allocations (amounts in thousands)</i>						
Other Costs and Revenue												
Energy Imbalance Market Administration Charges					100%	\$ 6,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 6,500
Nodal Pricing Model Fee						\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Intermittent Resource Forecasting Fees	80%	15%			5%	\$ 5,500	\$ 4,400	\$ 825	\$ -	\$ -	\$ 275	\$ -
Interest Earnings					100%	\$ 3,392	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,392
Generator Interconnection Project Fees and Application Fees			100%			\$ 2,000	\$ -	\$ -	\$ 2,000	\$ -	\$ -	\$ -
HANA Administrative Fees					100%	\$ 1,070	\$ -	\$ -	\$ -	\$ -	\$ 1,070	\$ -
California-Oregon Intertie Path Operator Fees			100%			\$ 700	\$ -	\$ -	\$ 700	\$ -	\$ -	\$ -
Metered Sub-Station Penalties					100%	\$ 440	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 440
SC Application Fees					100%	\$ 290	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 290
Planning Coordinator Fees			100%			\$ 110	\$ -	\$ -	\$ 110	\$ -	\$ -	\$ -
CRR Application Fees					100%	\$ 60	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 60
Sub-Total (without RC Funding Requirement)						\$ 20,062	\$ 4,400	\$ 825	\$ 2,810	\$ -	\$ 1,345	\$ 10,682
Reliability Coordinator Funding Requirement					100%	\$ 19,868	\$ -	\$ -	\$ -	\$ -	\$ 19,868	\$ -
Total Other Costs and Revenue						\$ 39,930	\$ 4,400	\$ 825	\$ 2,810	\$ -	\$ 21,213	\$ 10,682

Table 24b — Allocation of Operating Cost Reserve Adjustment to Cost Categories

Component	GMC							GMC						
	Market Services	Real-Time Dispatch	NEW System Operations- Balance Authority	CRR Services	Reliability Coordinator	Indirect		Budget	Market Services	Real-Time Dispatch	NEW System Operations- Balance Authority	CRR Services	Reliability Coordinator	Indirect
			Area Services								Area Services			
cost category % allocation							budget allocations (amounts in thousands)							
Operating Cost Reserve Adjustment														
Change in 15% Operating Cost Reserve						100%	\$ (970)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ (970)
25% Debt Service Reserve for Bonds						100%	\$ 2,938	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,938
2023 Revenue Budget to Actual Delta						100%	\$ 1,750	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,750
2023 Expense Budget to Actual Delta						100%	\$ 1,750	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,750
Total Operating Cost Reserve Adjustment							\$ 5,468	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,468

Table 25b — Allocation of Revenue Requirement to Cost Categories

Component	GMC						
	Budget	Market Services	NEW System Operations- Real-Time Dispatch	NEW System Operations- Balance Authority	CRR Services	Reliability Coordinator	Indirect
			Area Services	Area Services			
budget allocations (amounts in thousands)							
Direct Costs	\$ 212,322	\$ 68,394	\$ 30,498	\$ 37,877	\$ 3,382	\$ 10,191	\$ 61,980
Indirect Costs	\$ 7,057	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 7,057
Non-ABC Costs	\$ 39,043	\$ 2,063	\$ 611	\$ 33	\$ 50	\$ 1,645	\$ 34,641
Total O&M	\$ 258,422	\$ 70,457	\$ 31,109	\$ 37,910	\$ 3,432	\$ 11,836	\$ 103,678
Debt Service	\$ 14,686	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 14,686
Cash Funded Capital	\$ 15,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 15,000
Total Debt Service and Capital	\$ 29,686	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 29,686
Other Costs and Revenues (without RC Funding Requirement)	\$ (20,062)	\$ (4,400)	\$ (825)	\$ (2,810)	\$ -	\$ (1,345)	\$ (10,682)
Operating Cost Reserve Adjustment	\$ (5,468)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ (5,468)
Total Other Revenue and Operating Costs Reserve Adj	\$ (25,530)	\$ (4,400)	\$ (825)	\$ (2,810)	\$ -	\$ (1,345)	\$ (16,150)
Revenue Requirement Sub-Total Before Indirect Allocations	\$ 262,578	\$ 66,057	\$ 30,284	\$ 35,100	\$ 3,432	\$ 10,491	\$ 117,214
Direct Costs %		45%	21%	24%	2%	8%	
Indirect Costs Allocated Based on Direct Cost %	-	52,746	24,615	28,131	2,344	9,377	(117,214)
Revenue Requirement Sub-Total Before RC Funding Requirement Adjustment	\$ 262,578	\$ 118,803	\$ 54,899	\$ 63,231	\$ 5,776	\$ 19,868	\$ -
RC Funding Percentage		45%	21%	24%	2%	8%	
Reliability Coordinator Funding Requirement	\$ (19,868)	\$ -	\$ -	\$ -	\$ -	\$ (19,868)	\$ -
GMC Revenue Requirement	\$ 242,710	\$ 118,803	\$ 54,899	\$ 63,231	\$ 5,776	\$ -	\$ -
Cost Category Percentages for GMC Rates		49%	23%	26%	2%		

Table 26b — Estimation of Fee Revenue and Mapping of Fees to Cost Categories

Modified Revenue Requirement	Estimated 2022		NEW System Operations-Balance Authority Area Services					
	Fee	Volumes	Rate	Budget	Market Services	Operations-Real-Time Dispatch	CRRs	
<i>(amounts in thousands)</i>								
Bid Segment Fees	107,379,067	\$	0.0050	\$ 537	\$ 537			
Inter-SC Trade Fees	2,668,297	\$	1.0000	\$ 2,668	\$ 2,668			
SCID Fees	439	\$	1,500.0000	\$ 7,902	\$ 7,902			
TOR Charge	3,142,334	\$	0.3300	\$ 1,037		\$ 1,037		
CRR Auction Bid Fees	1,054,603	\$	1.0000	\$ 1,055			\$ 1,055	
Total				\$ 13,199	\$ 11,107	\$ 1,037	\$ -	\$ 1,055

Table 27b — 2022 GMC Rates Using Revised Cost Category Percentages

Modified Revenue Requirement: Bifurcated Systems Operations Rate and EDAM Transitional Ramp-In					
Component	GMC				
	Budget	Market Services	NEW System Operations-Real-Time Dispatch	NEW System Operations-Balance Authority Area Services	CRR Services
<i>budget allocations (amounts in thousands)</i>					
GMC Revenue Requirement	\$ 242,710	\$ 118,803	\$ 54,899	\$ 63,231	\$ 5,776
<i>Cost Category Percentages for GMC Rates</i>		49%	23%	26%	2%
Less Fees					
Bid Segment Fees	\$ (537)	\$ (537)	\$ -	\$ -	\$ -
Inter-SC Trade Fees	\$ (2,668)	\$ (2,668)	\$ -	\$ -	\$ -
SCID Fees	\$ (7,902)	\$ (7,902)	\$ -	\$ -	\$ -
TOR Fees	\$ (1,037)	\$ -	\$ (1,037)	\$ -	\$ -
CRR Auction Bid Fees	\$ (1,055)	\$ -	\$ -	\$ -	\$ (1,055)
Total Fees	\$ (13,199)	\$ (11,107)	\$ (1,037)	\$ -	\$ (1,055)
Remaining Revenue Requirement to Collect	\$ 229,511	\$ 107,696	\$ 53,862	\$ 63,231	\$ 4,721
Estimated Volumes					
Estimated Volumes		533,233	440,760	440,760	420,133
Estimated EDAM Volumes (PacifiCorp year 1 ramp-in volumes only) + System Operations Real-Time		126,977	141,626		-
Total Estimated Volumes (GWh)		660,210	582,386	440,760	420,133
2022 Rates Using Revised Percentages		\$ 0.1631	\$ 0.0925	\$ 0.1435	\$ 0.0112

Table 28b — Summary of GMC Cost Category Percentages and Costs

Cost Category Percentages and Costs <i>(\$\$ in thousands)</i>	2019		2022 Modified for 2024		2022 Modified for 2025-26	
	\$\$	%	\$\$	%	\$\$	%
	Market Services	\$ 86,800	49%	\$ 107,572	49%	\$ 118,803
System Operations	\$ 88,061	49%	\$ 106,899	49%		
New: Real-Time Dispatch					\$ 54,899	23%
New: Balance Authority Area Services					\$ 63,231	26%
CRR Services	\$ 3,965	2%	\$ 5,464	2%	\$ 5,776	2%
Total	\$ 178,826	100%	\$ 219,934	100%	\$ 242,710	100%

Table 29b — Summary of Direct and Indirect Costs

Direct Costs vs. Indirect Costs History <i>(\$\$ in thousands)</i>	2019		2022 Modified for 2024		2022 Modified for 2025-26	
	\$\$	%	\$\$	%	\$\$	%
	Direct Costs	\$ 89,555	50%	\$ 126,473	58%	\$ 134,873
Indirect Costs	\$ 89,271	50%	\$ 93,461	42%	\$ 107,837	44%
Total	\$ 178,826	100%	\$ 219,934	100%	\$ 242,710	100%

Schedule 2: Reliability Coordinator Services

Table 30b — Allocation of Revenue Requirement to RC Cost Category

Component	GMC						
	Budget	Market Services	NEW System Operations-Balance Authority		CRR Services	Reliability Coordinator	Indirect
			NEW System Operations-Real-Time Dispatch	Area Services			
	<i>budget allocations (amounts in thousands)</i>						
Direct Costs	\$ 212,322	\$ 68,394	\$ 30,498	\$ 37,877	\$ 3,382	\$ 10,191	\$ 61,980
Indirect Costs	\$ 7,057	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 7,057
Non-ABC Costs	\$ 39,043	\$ 2,063	\$ 611	\$ 33	\$ 50	\$ 1,645	\$ 34,641
Total O&M	\$ 258,422	\$ 70,457	\$ 31,109	\$ 37,910	\$ 3,432	\$ 11,836	\$ 103,678
Debt Service	\$ 14,686	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 14,686
Cash Funded Capital	\$ 15,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 15,000
Total Debt Service and Capital	\$ 29,686	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 29,686
Other Costs and Revenues (without RC Funding Requirement)	\$ (20,062)	\$ (4,400)	\$ (825)	\$ (2,810)	\$ -	\$ (1,345)	\$ (10,682)
Operating Cost Reserve Adjustment	\$ (5,468)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ (5,468)
Total Other Revenue and Operating Costs Reserve Adj	\$ (25,530)	\$ (4,400)	\$ (825)	\$ (2,810)	\$ -	\$ (1,345)	\$ (16,150)
Revenue Requirement Sub-Total Before Indirect Allocations	\$ 262,578	\$ 66,057	\$ 30,284	\$ 35,100	\$ 3,432	\$ 10,491	\$ 117,214
Direct Costs %		45%	21%	24%	2%	8%	
Indirect Costs Allocated Based on Direct Cost %	-	52,746	24,615	28,131	2,344	9,377	(117,214)
Revenue Requirement Sub-Total Before RC Funding Requirement Adjustment	\$ 262,578	\$ 118,803	\$ 54,899	\$ 63,231	\$ 5,776	\$ 19,868	\$ -
RC Funding Percentage		45%	21%	24%	2%	8%	
Reliability Coordinator Funding Requirement	\$ (19,868)	\$ -	\$ -	\$ -	\$ -	\$ (19,868)	\$ -
GMC Revenue Requirement	\$ 242,710	\$ 118,803	\$ 54,899	\$ 63,231	\$ 5,776	\$ -	\$ -
Cost Category Percentages for GMC Rates		49%	23%	26%	2%		

Table 31b --- Summary of RC Funding Percentage Changes

Cost Category	2019 Study Effective 2021 GMC RR	2022 Study Effective 2024 GMC RR	2022 Study Effective 2025-2026 GMC RR
Reliability Coordinator Services	9%	8%	8%

Schedule 3: Western Energy Imbalance Market

Table 42b --- Components of the 2022 Modified GMC Revenue Requirement

Modified GMC Revenue Requirement					
Component	Budget	Market Services	System Operations Real-Time Dispatch	System Operations BAA Services	CRR Services
Non-ABC O&M Support Costs	\$ 39,043	\$ 2,063	\$ 611	\$ 33	\$ 50
Direct ABC O&M Costs	\$ 212,322	\$ 68,394	\$ 30,498	\$ 37,877	\$ 3,382
Debt Service	\$ 14,686	\$ -	\$ -	\$ -	\$ -
Cash Funded Capital	\$ 15,000	\$ -	\$ -	\$ -	\$ -
Other Costs and Revenues	\$ (39,930)	\$ (4,400)	\$ (825)	\$ (2,810)	\$ -
Operating Costs Reserve Adjustment	\$ (5,468)	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 235,653	\$ 66,057	\$ 30,284	\$ 35,100	\$ 3,432
Indirect Costs	\$ 7,057	\$ 52,746	\$ 24,615	\$ 28,131	\$ 2,344
GMC Revenue Requirement Before Fees	\$ 242,710	\$ 118,803	\$ 54,899	\$ 63,231	\$ 5,776
Less Fees	\$ (13,199)	\$ (11,107)	\$ (1,037)	\$ -	\$ (1,055)
Remaining Revenue Requirement to Collect	\$ 229,511	\$ 107,696	\$ 53,862	\$ 63,231	\$ 4,721

Table 47b — Allocation of Market Services Other Revenue

Other Costs and Revenue	GMC		Market Services Split		Market Services Split		
	Market Services	Category	Real-Time Market	Day-Ahead Market	Category Budget	Real-Time Market	Day-Ahead Market
Component	<i>cost category % allocation</i>		<i>% of budget allocation</i>		<i>budget allocations (amounts in thousands)</i>		
Intermittent Resource Forecasting Fees	80%		100%		\$ 4,400	\$ 4,400	\$ -
Total Other Costs and Revenue					\$ 4,400	\$ 4,400	\$ -

Table 48b — Allocation of System Operations Other Revenue

Other Costs and Revenue						
Component	GMC		Budget	GMC		Comments
	NEW System Operations-Real-Time Dispatch	NEW System Operations-Balance Authority Area Services		NEW System Operations-Real-Time Dispatch	NEW System Operations-Balance Authority Area Services	
		<i>cost category % allocation</i>		<i>dget allocations (amounts in thousana)</i>		
Other Costs and Revenue						
Intermittent Resource Forecasting Fees	15%		\$ 825	\$ 124	\$ -	Use Process 80005, Task 353 allocations.
Generator Interconnection Project Fees and Application Fees		100%	\$ 2,000	\$ -	\$ 2,000	Use Process 80001, Task 203 allocations.
California-Oregon Intertie Path Operator Fees		100%	\$ 700	\$ -	\$ 700	Fees offset system operations costs.
Planning Coordinator Fees		100%	\$ 110	\$ -	\$ 110	Use Process 80001, Task 204 allocations.
Total Other Costs and Revenue			\$ 8,827	\$ 124	\$ 2,810	

Table 49b --- Mapping Revenue Requirement to Cost Categories

Modified GMC Revenue Requirement		Market Services Split			System Operations Real-Time Dispatch	System Operations BAA Services
Component	Budget	Market Services	Real-Time Market	Day-Ahead Market		
Non-ABC O&M Support Costs	\$ 39,043	\$ 2,063	\$ 1,941	\$ 122	\$ 611	\$ 33
Direct ABC O&M Costs	\$ 212,322	\$ 68,394	\$ 43,240	\$ 25,154	\$ 30,498	\$ 37,877
Debt Service	\$ 14,686	\$ -	\$ -	\$ -	\$ -	\$ -
Cash Funded Capital	\$ 15,000	\$ -	\$ -	\$ -	\$ -	\$ -
Other Costs and Revenues	\$ (39,930)	\$ (4,400)	\$ (4,400)	\$ -	\$ (825)	\$ (2,810)
Operating Costs Reserve Adjustment	\$ (5,468)	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 235,653	\$ 66,057	\$ 40,781	\$ 25,276	\$ 30,284	\$ 35,100
Indirect Costs	\$ 7,057	\$ 52,746	\$ 32,563	\$ 20,183	\$ 24,615	\$ 28,131
GMC Revenue Requirement Before Fees	\$ 242,710	\$ 118,803	\$ 73,344	\$ 45,459	\$ 54,899	\$ 63,231
Less Fees	\$ (13,199)	\$ (11,107)	\$ (4,220)	\$ (6,888)	\$ (1,037)	\$ -
Remaining Revenue Requirement to Collect	\$ 229,511	\$ 107,696	\$ 69,125	\$ 38,571	\$ 53,862	\$ 63,231
			64%	36%		

Table 50b --- Calculation of the WEIM Components

Cost Category	Category Net Costs	Pro Forma Rate	EIM Real-Time Activity	EIM Percentage of Costs	EIM Cost of Real-Time Activities	EIM Pro Forma Rate
	<i>(\$ in thousands)</i>	<i>(\$ / MWh)</i>			<i>(\$ in thousands)</i>	<i>(\$ / MWh)</i>
Market Services	\$ 107,696	\$ 0.1631	Real-Time Market	64%	\$ 69,125	\$ 0.1047
System Operations-Real-Time Dispatch	\$ 53,862	\$ 0.0925	Real-Time Dispatch	100%	\$ 53,863	\$ 0.0925

Table 51b --- Summary of WEIM Cost Category Percentage Changes

Cost Category	EIM Real-Time Activity	2019 Study Effective 2021 GMC	2022 Study Effective 2024 GMC	2022 Study Effective 2025 + 2026 GMC
Market Services	Real-Time Market	63%	65%	64%
System Operations	Real-Time Dispatch	50%	42%	
System Operations-Real-Time Dispatch	Real-Time Dispatch			100%

The Market Services percentage shifts back by 1% in 2025 as a result of the reduction in Nodal Pricing Model and WEIM Administrative fees in 2025.

Schedule 4: Transmission Ownership Rights

Table 54b --- Calculation of TOR Related Costs

Transmission Ownership Rights (TOR) Charge			2022 Study Effective 2025-2026 GMC RR	
ABC Code	Task Code	ABC Level 2 Activity	Amount (\$ in thousands)	
80004	301	Manage Full Network Model (FNM) Maintenance	\$	2,474
80004	311	Manage Operations Planning	\$	1,697
80004	312	Manage WECC Studies	\$	130
80005	355	Manage Outages	\$	2,290
80005	360	Real-Time Operations	\$	17,476
80005	362	Manage Operations Engineering Support	\$	4,161
80007	411	Manage Market Clearing	\$	75
80007	412	Manage Market Billing & Settlements	\$	992
Applicable Direct Costs			\$	29,295
Total System Operations Direct Costs			\$	65,384
Percentage of TORs to System Operations Direct Costs				45%
Total System Operations Indirect Costs			\$	52,746
Percentage Per Above				45%
Applicable Indirect Costs			\$	23,736
Total TOR Related Costs			\$	53,031

Table 56b --- Calculation of TOR Charge

TOR Fee Calculation		Amount
Total Applicable Direct and Indirect Costs	\$	53,030,835
TOR as a Percentage of Gross Volume		2.00%
TOR Costs to Collect	\$	1,060,617
TOR MWh for 2022 (min. of supply and demand)		3,252,441
TOR Charge per MWh	\$	0.3300

Table 57b --- Summary of TOR Charge Changes

Fee	2019 Study Effective 2021 GMC	2022 Study Effective 2024 GMC	2022 Study Effective 2025-2026 GMC
TOR Charge/MWh	\$ 0.1800	\$ 0.3200	\$ 0.3300