

April 27, 2021

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Re: California Independent System Operator Corporation
Filing of CAISO Rate Schedule No. 6648
Docket No. ER21-____-000**

Dear Secretary Bose:

The California Independent System Operator Corporation (“CAISO”) submits for filing and acceptance the Planning Coordinator Agreement, dated April 6, 2021, between the CAISO and the California Department of Water Resources (“CDWR”)¹. The Planning Coordinator Agreement sets forth the terms under which the CAISO will serve as the Planning Coordinator² for the transmission facilities owned by CDWR and that are part of the Bulk Electric System (“BES”) and located within CAISO’s Balancing Authority Area (“BAA”) (“CDWR BES Facilities”)³. Under the Planning Coordinator Agreement, CDWR will pay the CAISO an annual service fee for its services as Planning Coordinator during the initial three-year term of the agreement.

The CAISO respectfully requests that the Commission accept the Planning Coordinator Agreement. The agreement promotes reliability within the CAISO’s balancing authority area, and compliance with NERC standards, by allowing the CAISO

¹ The CAISO submits the Planning Coordinator Agreement pursuant to Rule 205 of the Commission’s Rules of Practice and Procedure, 18 C.F.R. § 385.205 and Section 205 of the Federal Power Act, 16 U.S.C. § 824d.

² The term “Planning Coordinator” is defined in the North American Electric Reliability Corporation (“NERC”) Reliability Functional Model. The NERC Reliability Functional Model (Version 5) defines Planning Coordinator as “The functional entity that coordinates, facilitates, integrates and evaluates (generally one year and beyond) transmission facility and service plans, and resource plans within a Planning Coordinator area and coordinates those plans with adjoining Planning Coordinator areas.” *NERC Reliability Functional Model, Function Definitions and Functional Entities*, Version 5, page 22 (November 30, 2009).

³ The specific CDWR BES Facilities are set forth in Attachment 1 to the Planning Coordinator Agreement.

to serve as CDWR's Planning Coordinator. The CAISO requests an effective date of June 27, 2021.

I. Background

The NERC Reliability Standards establish the Planning Authority, which is synonymous with the term "Planning Coordinator", as one of the functional entities within the NERC Functional Model. The CAISO is registered as a Planning Authority.⁴ As required by NERC regulations, the Planning Authority coordinates and integrates transmission facility and service plans, resource plans, and protection system plans among the Transmission Planners, Resource Planners, and Distribution Providers within its area of purview.⁵ These activities include the review and integration of reinforcement and corrective action plans developed by the functional entities (i.e., Planning Authority, Transmission Planner, and Resource Planner) whose area of responsibility is within the Planning Authority's area with respect to established reliability needs, as well as providing procedures, protocols, modeling and methodology software, etc. for consistent use within its area.

The NERC Reliability Functional Model further describes that the Planning Coordinator:

(1) coordinates and collects data for system modeling from Transmission Planners, Resource Planners, and other Planning Coordinators;

(2) coordinates transfer capability (generally one year and beyond) with Transmission Planners, Reliability Coordinators, Transmission Owners, Transmission Operators, Transmission Service Providers, and neighboring Planning Coordinators;

(3) coordinates plans with the Reliability Coordinator and other Planning Coordinators on reliability issues;

(4) receives plans from Transmission Planners and Resource Planners;

(5) collects information including (a) transmission facility characteristics and ratings from the Transmission Owners, Transmission Planners, and Transmission Operators, (b) demand and energy forecasts, capacity resources, and demand response programs from Load-Serving Entities, and Resource Planners, (c) generator unit performance characteristics and capabilities from

⁴ The CAISO is also registered as a Balancing Authority, Transmission Operator, and Transmission Service Provider.

⁵ NERC Reliability Functional Model, Function Definitions and Functional Entities, Version 5, pages 22-23.

Generator Owners, and (d) long-term capacity purchases and sales from Transmission Service Providers;

(6) collects and reviews reports on transmission and resource plan implementation from Resource Planners and Transmission Planners;

(7) submits and coordinates the plans for the interconnection of facilities to the Bulk Electric System within its Planning Coordinator area with Transmission Planners and Resource Planners and adjacent Planning Coordinator areas, as appropriate;

(8) provides and informs Resource Planners, Transmission Planners, and adjacent Planning Coordinators of the methodologies and tools for the simulation of the transmission system; and

(9) facilitates the integration of the respective plans of the Resource Planners and Transmission Planners within the Planning Coordinator area.⁶

Through its Transmission Control Agreement, the CAISO currently acts as the Planning Coordinator for its participating transmission owners, who have transferred their transmission lines and associated facilities to the CAISO's operational control. Consistent with the CAISO's registration as a Planning Coordinator, its participating transmission owners are registered as Transmission Planners.

There are other transmission owners, known as "adjacent systems," who have facilities or systems that are connected to the transmission network under CAISO operational control, but are not within the CAISO's planning coordinator boundary. Some of these transmission owners do not have a Planning Coordinator for these particular systems and facilities. Because these adjacent systems are not within the CAISO's planning coordinator area boundary, the NERC regulations do not require the CAISO to be their Planning Coordinator. NERC regulations do, however, require these adjacent systems to be responsible for the planning of their own systems and facilities and, thus, to be represented by a registered Planning Coordinator.

Recently, the CAISO identified several adjacent systems who are not represented by a Planning Coordinator with respect to some or all of their systems or facilities under CAISO operational control. In an effort to enhance system reliability under the NERC Functional Model, the CAISO offered to provide Planning Coordinator services on behalf of these adjacent systems. CDWR expressed an interest in the CAISO's offer.⁷

After further discussions with CDWR, the parties negotiated and executed a Planning Coordinator Agreement, whereby the CAISO has agreed to serve as the

⁶ *Id.*

⁷ CDWR is registered with NERC as a Transmission Planner, Generation Owner, Generator Operator, Transmission Owner, and Resource Planner.

Planning Coordinator for CDWR with respect to the CDWR BES Facilities in exchange for a modest service fee, discussed in detail below. This agreement allows adjacent systems, like CDWR, to have a Planning Coordinator and, thus, furthers the NERC reliability objective that all transmission owners have a Planning Coordinator for their Bulk Electric System facilities.

II. The Planning Coordinator Agreement

The Planning Coordinator Agreement details the contractual terms, including the scope of work and the fee, under which the CAISO will provide Planning Coordinator services to CDWR. The fundamental purposes served by the Planning Coordinator Agreement are described below.

A. The Planning Coordinator Agreement Establishes the Parties' Respective Responsibilities

The Planning Coordinator Agreement establishes the respective obligations of the CAISO and CDWR, which are set forth in Article II.

Specifically, the CAISO must maintain its registration as a Planning Coordinator with NERC and serve as the Planning Coordinator for the CDWR BES Facilities covered by the agreement. In conjunction with these services, the CAISO will be responsible for compliance, as determined by the Commission, NERC, and the Western Electricity Coordinating Council, with all reliability standards applicable to a Planning Coordinator for the CDWR BES Facilities. Because the CAISO is already a Planning Coordinator for its participating transmission owners, it will be able to leverage its existing processes in serving as the Planning Coordinator for CDWR.

CDWR is responsible for maintaining its registration with NERC as a Transmission Planner and Transmission Owner. CDWR is also responsible for ensuring that it is in compliance, as determined by the Commission, NERC and the Western Electricity Coordinating Council, with all reliability standards applicable to a Transmission Planner and Transmission Owner for the CDWR BES Facilities. Consistent with its responsibility to meet reliability standards applicable to a Transmission Planner and a Transmission Owner, CDWR is solely responsible for implementing necessary corrective actions, modifications or changes to the CDWR BES facilities.

B. The Planning Coordinator Agreement Describes the Parties' Duties of Cooperation and Coordination

To facilitate the fulfillment of the parties' roles and responsibilities, Article III of the Planning Coordinator Agreement sets forth the parties' duties of cooperation and coordination with each other.

Specifically, Attachment 2 to the Planning Coordinator Agreement illustrates the various areas in which the parties will coordinate their efforts, including the sharing and assessment of data related to interconnections, transmission planning, transfer capability and stability limits, modeling, underfrequency load shedding, transmission relay loadability, and outage coordination. In addition, the parties will cooperate with each other regarding all compliance related activities with respect to the CAISO Planning Coordinator functions and the CDWR Transmission Planner and Transmission Owner functions. This includes complying with a reasonable request for data or assistance from the other party to demonstrate compliance with an applicable Reliability Standard and to support the party's self-certifications, potential violation reviews or audits.

C. The CAISO Will Charge CDWR an Annual Service Fee in Exchange for Its Planning Coordinator Services

The Planning Coordinator Agreement specifies that CDWR will pay an annual service fee during the initial three-year term of the agreement.⁸ The fee reflects CDWR's *pro rata* share of the CAISO's costs for transmission planning. The CAISO calculated the costs of transmission planning in a 2019 Cost of Service Study that formed the basis of the CAISO's 2021 Grid Management Charge Update. The CAISO allocated costs to CDWR based on its number of circuits of transmission facilities as a portion of the total number of circuits of transmission facilities for which the CAISO conducts planning. The discussion paper of the 2021 Grid Management Charge Update and spreadsheets documenting the derivation and allocation of the transmission planning costs are included with the Declaration of April Gordon in Attachment B.⁹ After the initial three-year term of the agreement, subsequent annual service fees will be calculated in the same manner using data from the most recently published Grid Management Charge Update.

D. Other Provisions

The Planning Coordinator Agreement includes a variety of standard provisions that round out the parties' commitments. These include confidentiality (Section 4.2), termination (Section 4.4), dispute resolution (Section 4.5), representations and warranties (Section 4.6), limitations of liability (Section 4.7.1), governing law and venue (Section 4.13), and certain miscellaneous provisions.

⁸ Planning Coordinator Agreement, Section 4.1.1 and Attachment 3.

⁹ The cost allocation methodology used to determine the annual service fee for CDWR is the same methodology used for calculating the annual service fee for the City and County of San Francisco, the Metropolitan Water District of Southern California, Southern California Edison, and Silicon Valley Power in connection with their respective Planning Coordinator Agreements with the CAISO and which were previously approved by the Commission.

III. Next Steps

Following Commission acceptance of this filing, the CAISO will complete the transmission plan studies and its collection and assessment of the data necessary to meet its Planning Coordinator obligations.

IV. Effective Date

The CAISO requests that the Planning Coordinator Agreement be made effective June 27, 2021.

V. Request for Confidential Treatment

Attachment 1 to the Planning Coordinator Agreement is a diagram of the CDWR BES Facilities and, thus, includes Critical Energy Infrastructure Information ("CEII") (as defined in 18 C.F.R. §388.113) that is being submitted pursuant to 18 C.F.R §388.112. Accordingly, the information is exempt from mandatory public disclosure requirements under the Freedom of Information Act ("FOIA"), 5 U.S.C. § 552, and should be withheld from public disclosure. Notwithstanding this fact, the CAISO requests that the Commission provide the CAISO with notice of any FOIA requests and the opportunity to participate in any proceeding initiated to determine whether the Commission should direct disclosure of the aforementioned information.

VI. Request for Waivers

The CAISO believes this filing constitutes a new service (Planning Coordinator Services) to a customer (CDWR), and is thus an initial rate schedule, subject to section 35.12 of the Commission's regulations, 18 C.F.R. § 35.12 (2016). This filing substantially complies with the requirements of section 35.12 of the Commission's regulations, 18 C.F.R. § 35.12 (2016), applicable to filings of this type. The CAISO respectfully requests waiver of any such requirement to the extent this filing does not satisfy that requirement.

In the event the Commission concludes that this filing is a change in a rate tariff or service agreement, the CAISO submits that the filing also substantially complies with the requirements of section 35.13 of the Commission's rules, 18 C.F.R. § 35.13 (2016), applicable to filings of this type. The CAISO respectfully requests waiver of any such requirement to the extent this filing does not satisfy that requirement.

In either event, there is good cause to waive filing requirements that are not material to the Commission's consideration of the Planning Coordinator Agreement.

VII. Service

The CAISO has served copies of this filing upon all scheduling coordinators, the California Public Utilities Commission, and the California Energy Commission. In addition, the CAISO has posted the filing on the CAISO website.

VIII. Contents of Filing

Besides the transmittal letter, this filing includes the following:

Attachment A	Planning Coordinator Agreement
Attachment B	Declaration of April Gordon, Director of Financial Planning and Procurement
Attachment C	CEII Confidential Diagrams

IX. Correspondence

The CAISO requests that all correspondence, pleadings, and other communications concerning this filing be served upon the following:

John E. Spomer*
Senior Counsel
California Independent System
Operator Corporation
250 Outcropping Way
Folsom, CA 95630
Tel: (916) 608-7257
E-mail: jspomer@caiso.com

* Individual designated for service pursuant to Rule 203(b)(3),
18 C.F.R. § 203(b)(3).

X. Conclusion

The CAISO respectfully requests that the Commission accept this filing and permit the Planning Coordinator Agreement, CAISO Rate Schedule No. 6648, to be effective June 27, 2021. If there are any questions concerning this filing, please contact the undersigned.

Respectfully submitted,

By: /s/ John E. Spomer

Roger E. Collanton

General Counsel

John Anders

Assistant General Counsel

John E. Spomer

Senior Counsel

California Independent System

Operator Corporation

250 Outcropping Way

Folsom, CA 95630

Tel: (916) 608-7257

Fax: (916) 608-7222

jspomer@caiso.com

Attorneys for the California Independent
System Operator Corporation

Attachment A – Planning Coordinator Agreement
Between
California Departments of Water Resources
and the
California Independent System Operator Corporation
April 27, 2021

PLANNING COORDINATOR AGREEMENT

**CALIFORNIA INDEPENDENT SYSTEM OPERATOR
CORPORATION**

AND

**CALIFORNIA DEPARTMENT OF WATER
RESOURCES**

PLANNING COORDINATOR AGREEMENT

THIS AGREEMENT is dated this 6th day of April, 2021, and is entered into, by and between:

(1) **California Department of Water Resources** having its registered and principal place of business located at 1416 Ninth Street, Sacramento, California 95814. (“CDWR”);

and

(2) the **California Independent System Operator Corporation**, a California nonprofit public benefit corporation, having a principal executive office located at such place in the State of California as the CAISO Governing Board may from time to time designate, initially 250 Outcropping Way, Folsom, California 95630 (“CAISO”).

CDWR and CAISO are hereinafter referred to as the “Parties”.

RECITALS

A. WHEREAS, Section 215 of the Federal Power Act, 16 USC 824o, requires all users, owners and operators of the bulk-power system to comply with applicable reliability standards approved by the Federal Energy Regulatory Commission (“FERC”) (“Reliability Standards”); and

B. WHEREAS, North American Electric Reliability Corporation (“NERC”) and the Western Electricity Coordinating Council (“WECC”) have developed Reliability Standards, certain of which apply to CAISO and CDWR, and NERC has delegated to WECC enforcement of the Reliability Standards in the Western Interconnection including California; and

C. WHEREAS, CDWR owns transmission facilities that are part of the Bulk Electric System (“BES”) and are located within CAISO’s Balancing Authority Area (“CDWR BES Facilities”). The CDWR BES Facilities covered by this Agreement are listed in Attachment 1.

D. WHEREAS, CDWR’s current CDWR BES Facilities covered by this Agreement are set forth in the diagram attached as Attachment 1 (Attachment 1 contains Confidential Information and is subject to Section 4.2); and

E. WHEREAS, CDWR is registered with NERC as a Transmission Owner, Transmission Planner, Generator Owner, Generator Operator, and Resource Planner; and

F. WHEREAS, CAISO is registered with NERC as a Planning Authority (which is synonymous with “Planning Coordinator”); and

G. WHEREAS, CDWR has determined that there is a need for CDWR to identify a Planning Coordinator for its CDWR BES Facilities covered by this Agreement, currently and into the foreseeable future; and

H. WHEREAS, CAISO has determined it is qualified to be the Planning Coordinator for CDWR; and

I. WHEREAS, pursuant to this Agreement, CAISO agrees to be the Planning Coordinator for CDWR; and

J. WHEREAS, the Parties are entering into this Agreement in order to establish the terms and conditions on which CAISO and CDWR will discharge their respective duties and responsibilities.

NOW THEREFORE, in consideration of the mutual covenants set forth herein, THE PARTIES AGREE as follows:

AGREEMENT

ARTICLE I

DEFINITIONS AND INTERPRETATION

1.1 Definitions. Capitalized words in this Agreement that are not defined herein shall have the meanings set forth in NERC’s “Glossary of Terms Used in NERC Reliability Standards” (“NERC Glossary of Terms”).

1.2 Rules of Interpretation. The following rules of interpretation and conventions shall apply to this Agreement:

- (a) if there is any inconsistency between this Agreement and the NERC Glossary of Terms, the NERC Glossary of Terms will prevail to the extent of the inconsistency;
- (b) the singular shall include the plural and vice versa;
- (c) the masculine shall include the feminine and neutral and vice versa;
- (d) “includes” or “including” shall mean “including without limitation”;

- (e) references to an Article, Section or Attachment shall mean an Article, Section or Attachment of this Agreement, as the case may be, unless the context otherwise requires;
- (f) a reference to a given agreement or instrument shall be a reference to that agreement or instrument as modified, amended, supplemented or restated through the date as of which such reference is made;
- (g) unless the context otherwise requires, references to any law shall be deemed references to such law as it may be amended, replaced or restated from time to time;
- (h) unless the context otherwise requires, any reference to a “person” includes any individual, partnership, firm, company, corporation, joint venture, trust, association, organization or other entity, in each case whether or not having separate legal personality;
- (i) unless the context otherwise requires, any reference to a Party includes a reference to its permitted successors and assigns;
- (j) any reference to a day, week, month or year is to a calendar day, week, month or year; and
- (k) the captions and headings in this Agreement are inserted solely to facilitate reference and shall have no bearing upon the interpretation of any of the terms and conditions of this Agreement.

ARTICLE II

GENERAL RESPONSIBILITIES OF THE PARTIES

2.1 Description of CAISO Responsibilities. While the Agreement is in effect, CAISO shall have the following responsibilities, including:

- (a) CAISO is registered with NERC as a Planning Authority (which is synonymous with a Planning Coordinator); and
- (b) CAISO will serve as the Planning Coordinator (as that term is defined in the NERC Reliability Functional Model) for the CDWR BES Facilities covered by this Agreement; and
- (c) While the Agreement is in effect, CAISO will be responsible for compliance, as determined by FERC, NERC and WECC, with all Reliability Standards applicable to a Planning Coordinator for the CDWR BES Facilities and covered by this Agreement.

2.2 Description of CDWR Responsibilities. While the Agreement is in effect, CDWR shall have the following responsibilities, including:

(a) CDWR is registered with NERC as a Transmission Planner and Transmission Owner; and

(b) CDWR will be responsible for compliance, as determined by FERC, NERC and WECC, with all Reliability Standards applicable to a Transmission Planner and Transmission Owner for the CDWR BES Facilities covered by this Agreement – as specified in the list in Attachment 1.

ARTICLE III

PROCEDURES AND COMPLIANCE

3.1 Coordination. The Parties agree that, for illustrative purposes only, Attachment 2 to this Agreement describes how CAISO and CDWR anticipate coordinating with each other while carrying out their respective responsibilities, with CAISO as a Planning Coordinator, and with CDWR as a Transmission Planner and Transmission Owner with respect to the CDWR BES Facilities covered by this Agreement. CDWR and CAISO may revise Attachment 2 by mutual written agreement. Regardless of the terms set forth in Attachment 2, the Parties agree that they must each meet their respective responsibilities, with CAISO as a Planning Coordinator, and with CDWR as a Transmission Planner and Transmission Owner.

3.2 CAISO's Use Of Existing Practices, Procedures and Processes. Except as otherwise agreed by the Parties, to the extent applicable, CAISO will utilize its existing practices, procedures, and processes in performing its responsibilities as the Planning Coordinator for CDWR. For the avoidance of doubt, the Parties clarify that requests for new or modified interconnections to the CDWR BES Facilities covered by this Agreement may be processed pursuant to the interconnection procedures adopted by CDWR and are not required to be undertaken pursuant to CAISO's existing practices, procedures and process for interconnections to PTO facilities.

3.3 Interconnections to PTO Facilities. This Agreement does not change the respective rights and responsibilities of CAISO and CDWR with respect to interconnections to other facilities.

3.4 CDWR's Responsibility for its Facilities. CDWR will coordinate and cooperate with CAISO in accordance with applicable Reliability Standards and will seek in good faith to reach agreement where possible on study assumptions, impacts and acceptable solutions. Nonetheless, consistent with its responsibility to meet Reliability Standards applicable to a Transmission Owner and a Transmission Planner, CDWR has final authority over and is solely responsible for implementing necessary corrective actions, modifications or changes to its facilities.

3.5 Provision of Data. CDWR will provide to CAISO in a timely manner all model data, including facility ratings, necessary for CAISO to perform the studies required for the CAISO to fulfill its responsibilities as Planning Coordinator for the CDWR BES Facilities covered by this Agreement, and CAISO agrees to use this information solely for this purpose.

3.6 Compliance.

3.6.1 The Parties will cooperate with each other with respect to all compliance related activities, including but not limited to WECC audits of Reliability Standards, and with respect to the CDWR Transmission Planner and Transmission Owner functions, and to the CAISO Planning Coordinator functions.

3.6.2 Each Party shall comply with a reasonable request for data or assistance from the other Party to the extent reasonably necessary to demonstrate compliance with an applicable Reliability Standard, including providing reports or data reasonably necessary to support the other party's self-certifications, potential violation reviews, or WECC audits of Reliability Standards.

3.7 Additional Studies or Assessments by CAISO. CDWR may request CAISO to undertake additional studies or assessments that are not within CAISO's responsibility as a Planning Coordinator. At its sole discretion, CAISO may agree to undertake such studies or assessments, subject to reimbursement for the cost of such work by CDWR in accordance with Section 4.1.2 of the Agreement

ARTICLE IV

GENERAL TERMS AND CONDITIONS

4.1 Payment

4.1.1 Annual Service Fee. CDWR will compensate CAISO for its services as Planning Coordinator under this Agreement by paying CAISO an annual service fee ("Annual Fee"), which will not exceed an aggregate sum of \$50,655.00 during the Current Term of the Agreement.

CAISO shall invoice CDWR for the first Annual Fee within thirty (30) days of the Effective Date, and shall invoice CDWR within thirty (30) days of each anniversary to the Effective Date during the Current Term consistent with Section 4.1.3. CDWR will pay the invoice no later than thirty (30) days after receipt thereof.

The annual service fee will be based on the number of CDWR BES Facilities covered by this Agreement multiplied by CAISO's long term transmission planning process ("TPP") cost per transmission circuit. The TPP cost per transmission circuit will be

based on the CAISO annual budget and Grid Management Charge Rates as amended from time to time and the total number of circuits owned by the PTOs included in CAISO's most current transmission plan. The calculation of the annual service fee for each year of the Current Term is set forth in Attachment 3. Subsequent annual service fees will be calculated in the same manner using data from the most recently published California ISO Grid Management Charge Update Cost of Service Study.

4.1.2 Hourly Fees. If, pursuant to Section 3.7, CDWR requests CAISO to undertake additional studies or assessments that are not within CAISO's responsibility as a Planning Coordinator, and CAISO agrees to undertake such studies or assessments, CDWR shall compensate CAISO at an hourly rate that is based on CAISO's internal labor costs plus overhead. Before any studies or assessments are undertaken, CAISO and CDWR will agree in writing on the applicable hourly rate, the scope of work, and a total fee estimate. CAISO shall submit to CDWR monthly invoices for such studies or assessments consistent with Section 4.1.3 of the Agreement no later than thirty days after undertaking such work.

4.1.3 Invoices. Invoices furnished by CAISO under this Agreement will be in a form acceptable to CDWR and include a unique invoice number. CDWR will provide CAISO with an acceptable form of invoice no later than the Effective Date of the Agreement. Payment shall be made by CDWR to CAISO at the address specified in Attachment 4 to this Agreement.

4.2 Confidentiality

4.2.1 Both Parties understand and agree that, in the performance of the work or services under this Agreement or in contemplation thereof, a Party (a "Recipient") may have access to private or Confidential Information (as defined below) which may be owned or controlled by the other Party (a "Discloser") and that such information may contain proprietary or confidential details, the disclosure of which to third parties may be damaging to the Discloser. Both Parties agree that all Confidential Information disclosed by a Discloser to a Recipient shall be held in confidence by the Recipient and used only in performance of the Agreement, except to the extent such information is required to be disclosed by local, State or Federal laws and regulations or by court or public agency order. A Recipient shall exercise the same standard of care to protect a Discloser's confidential information, as a reasonably prudent contractor would use to protect its own proprietary data. "Confidential Information" means (i) all written materials marked "Confidential", "Proprietary" or with words of similar import provided to either Party by the other Party, and (ii) all observations of equipment (including computer screens) and oral disclosures related to either Party's systems, operations and activities that are indicated as such at the time of observation or disclosure, respectively, provided that such indication is confirmed in writing within five (5) business days of the disclosure. Confidential Information includes portions of documents, records and other material forms or representations that either Party may create, including but not limited to, handwritten notes or summaries that contain or are derived from such Confidential Information.

4.2.2 In the event that disclosure of confidential or proprietary information is required by local, State or Federal laws and regulations or by court or public agency order, the Recipient shall give prior written notice to the Discloser as far in advance as reasonably possible. The Recipient shall cooperate with the Discloser in the event the Discloser seeks a protective order or other appropriate remedy to prevent such disclosure and, if such a protective order or other remedy cannot be obtained by such Discloser, the Recipient shall disclose only that portion of the confidential or proprietary information that is legally required to be disclosed.

4.2.3 Notwithstanding Sections 4.2.1 and 4.2.2 above, each Party to this Agreement shall not have breached any obligation under this Agreement if Confidential Information is disclosed to a third party when the Confidential Information: (a) was in the public domain at the time of such disclosure or is subsequently made available to the public consistent with the terms of this Agreement; or (b) had been received by either Party at the time of disclosure through other means without restriction on its use, or had been independently developed by either Party as shown through documentation; or (c) is subsequently disclosed to either Party by a third party without restriction on use and without breach of any agreement or legal duty; or (d) subject to the provisions of Section 4.2.2, is used or disclosed pursuant to statutory duty or an order, subpoena or other lawful process issued by a court or other governmental authority of competent jurisdiction.

4.2.4 The Parties acknowledge that the CAISO must comply with Section 20 of the CAISO Tariff.

4.3 Effective Date. This Agreement shall be effective as of the later of the date it is executed by the Parties or the date accepted for filing and made effective by FERC ("Effective Date") and shall remain in full force and effect for three (3) years from the Effective Date ("Current Term") or as terminated pursuant to Section 4.4 of this Agreement. Beginning on the Effective Date, CAISO will commence activities necessary to perform the services described in Section 2.1 herein. The Parties may mutually agree in writing to extend the term of the Agreement at any time.

4.4 Termination

4.4.1 Termination by CAISO. CAISO may terminate this Agreement by giving thirty (30) days prior written notice of termination to CDWR, in the event that CDWR commits any material default under this Agreement which, if capable of being remedied, is not remedied within thirty (30) days after CAISO has given to CDWR written notice of the default, unless excused by reason of Uncontrollable Force (as defined in Appendix A of the CAISO Tariff) in accordance with Section 4.9 of this Agreement. In addition, CAISO may terminate this Agreement by giving not less than a one year prior written notice of termination to CDWR. With respect to any notice of termination given pursuant to this Section, if filing at FERC is required for this Agreement, CAISO must file a timely notice of termination with FERC. In the case of

a CDWR uncured material default, the filing of the notice of termination by CAISO with FERC will be considered timely if the filing of the notice of termination is made after the preconditions for termination have been met, and CAISO files the notice of termination within sixty (60) days after issuance of the notice of default. The notice of termination shall become effective on the later of (i) the date specified in the notice of termination, or (ii) in the event filing of the notice of termination is required, the date FERC accepts such notice.

4.4.2 Termination by CDWR. CDWR may terminate this Agreement by giving not less than ninety (90) days prior written notice of termination to CAISO. With respect to any notice of termination given pursuant to this Section, if filing at FERC is required for this Agreement, CAISO must file a timely notice of termination with FERC. The filing of the notice of termination by CAISO with FERC will be considered timely if the request to file a notice of termination is made, and CAISO files the notice of termination with FERC within thirty (30) days of receipt of CDWR's notice of termination. The notice of termination shall become effective on the later of (i) the date specified in the notice of termination, or (ii) in the event filing of the notice of termination is required, the date FERC accepts such notice.

4.4.3 Termination by Mutual Agreement. The Parties may terminate this Agreement at any time upon mutual agreement in writing.

4.4.4 Effect of Expiration or Termination. Upon the expiration or termination of this Agreement for any reason, each Party will be released from all obligations to the other Party arising after the date of expiration or termination, except that expiration or termination of this Agreement will not (i) relieve either Party of those terms of this Agreement which by their nature are intended to survive, including without limitation Section 4.1.3 (Invoices), Section 4.2 (Confidentiality), Section 4.5 (Dispute Resolution), Section 4.6 (Representations and Warranties), Section 4.7 (Liability), Section 4.8 (Insurance), Section 4.11 (Notices), Section 4.13 (Governing Law and Forum), and Section 4.17 (Severability), (ii) relieve CDWR of its payment obligations for services already rendered in accordance with the terms of this Agreement, or (iii) relieve either Party from any liability arising from any breach of this Agreement.

4.4.5 Transition Assistance. Except in the case of a termination for a default by CDWR, if CDWR so requests, CAISO will reasonably assist CDWR to transition to another Planning Coordinator, including providing data and assistance, provided that CDWR will reimburse CAISO for its reasonable costs of such assistance.

4.5 Dispute Resolution. The Parties shall make reasonable efforts to settle all disputes arising out of or in connection with this Agreement. If such efforts do not result in settlement, Section 4.13 shall apply.

4.6 Representation and Warranties. Each Party represents and warrants that the execution, delivery and performance of this Agreement by it has been duly

authorized by all necessary corporate and/or governmental actions, to the extent authorized by law.

4.7 Liability.

4.7.1 Limitation of Liability. Neither Party shall be liable to the other Party under any circumstances, whether any claim is based on contract or tort, for any special, consequential, indirect or incidental damages, including, but not limited to, lost profits, loss of earnings or revenue, loss of use, loss of contract or loss of goodwill, arising out of or in connection with this Agreement or the services performed in connection with this Agreement.

4.7.2 Assessment of Penalties. If FERC, NERC or WECC assesses one or more monetary penalties against CAISO as a Planning Coordinator for the violation of one or more Reliability Standards, and the conduct or omission(s) of CDWR contributed, in whole or in part, to the violation(s) at issue, then the CAISO may recover from CDWR that portion of the penalty that resulted from CDWR's conduct or omissions(s) provided that each of the conditions set forth in Section 14.7.2.1 of the CAISO Tariff are met except that references to the Market Participant that caused or contributed to the violation at issue should be taken to be references to CDWR, and instead of the payment provisions described in Section 14.7.2.5 of the CAISO Tariff, the payment provisions in Section 4.1.3 of this Agreement shall apply.

4.8 Insurance. CAISO is responsible for maintaining in force, during the full term of the Agreement, Commercial General Liability, Workers' Compensation, Commercial Auto Liability and Professional Liability insurance coverage.

4.9 Uncontrollable Forces Tariff Provisions. The Parties agree that Section 14.1 of the CAISO Tariff shall be incorporated by reference into this Agreement except that all references in Sections 14.1, 14.2 and 14.3 of the CAISO Tariff to Market Participants shall be read as a reference to CDWR and references to the CAISO Tariff shall be read as references to this Agreement.

4.10 Assignments. Either Party may assign or transfer any or all of its rights and/or obligations under this Agreement with the other Party's prior written consent in accordance with Section 22.2 of the CAISO Tariff. In the case of CDWR, a prior written consent must be executed and approved in the same manner as this Agreement. Any such transfer or assignment shall be conditioned upon the successor in interest accepting the rights and/or obligations under this Agreement as if said successor in interest was an original Party to this Agreement.

4.11 Notices. The Parties agree that any notice, demand or request which may be given to or made upon either Party regarding this Agreement shall be made in accordance with Section 22.4.1 of the CAISO Tariff, provided that all references in Section 22.4.1 of the CAISO Tariff to Market Participants shall be read as a reference to CDWR and references to the CAISO Tariff shall be read as references to this

Agreement, and unless otherwise stated or agreed shall be made to the representative of the other Party indicated in Attachment 4. A Party must update the information in Attachment 4 of this Agreement as information changes. Such changes shall not constitute an amendment to this Agreement.

4.12 Waivers. Any waiver at any time by either Party of its rights with respect to any default under this Agreement, or with respect to any other matter arising in connection with this Agreement, shall not constitute or be deemed a waiver with respect to any subsequent default or other matter arising in connection with this Agreement. Any delay, short of the statutory period of limitations, in asserting or enforcing any right under this Agreement shall not constitute or be deemed a waiver of such right.

4.13 Governing Law and Forum. This Agreement shall be deemed to be a contract made under, and for all purposes shall be governed by and construed in accordance with, the laws of the State of California, except its conflict of law provisions. The Parties irrevocably consent that any legal action or proceeding arising under or relating to this Agreement, shall be brought in any of the following forums, as appropriate: any court of the State of California or any federal court of the United States of America located in Sacramento in the State of California, or, where subject to its jurisdiction, before the Federal Energy Regulatory Commission.

4.14 Compliance with Laws. The Parties shall keep themselves fully informed of all federal, state and local laws in any manner affecting the performance of this Agreement, and must at all times comply with such applicable laws as they may be amended from time to time.

4.15 Subcontracting. Neither Party may subcontract this Agreement, nor any part of thereof, unless such subcontracting is first approved by the other Party in writing. Neither Party shall, on the basis of this Agreement, contract on behalf of or in the name of the other Party. An agreement made in violation of this provision shall confer no rights on any Party and shall be null and void.

4.16 Merger. This Agreement constitutes the complete and final agreement of the Parties with respect to the subject matter hereof and supersedes all prior agreements, whether written or oral, with respect to such subject matter.

4.17 Severability. If any term, covenant, or condition of this Agreement or the application or effect of any such term, covenant, or condition is held invalid as to any person, entity, or circumstance, or is determined to be unjust, unreasonable, unlawful, imprudent, or otherwise not in the public interest by any court or government agency of competent jurisdiction, then such term, covenant, or condition shall remain in force and effect to the maximum extent permitted by law, and all other terms, covenants, and conditions of this Agreement and their application shall not be affected thereby, but shall remain in force and effect and the Parties shall be relieved of their obligations only to the extent necessary to eliminate such regulatory or other determination unless

a court or governmental agency of competent jurisdiction holds that such provisions are not separable from all other provisions of this Agreement.

4.18 Amendments. This Agreement and the Attachments hereto may be amended from time to time by the mutual agreement of the Parties in writing. Amendments that require FERC approval shall not take effect until FERC has accepted such amendments for filing and made them effective.

Nothing contained herein shall be construed as affecting in any way the right of CAISO to unilaterally make application to FERC for a change in the rates, terms and conditions of this Agreement under Section 205 of the FPA and pursuant to FERC's rules and regulations promulgated thereunder, and CDWR shall have the right to make a unilateral filing with FERC to modify this Agreement pursuant to Section 206 or any other applicable provision of the FPA and FERC's rules and regulations thereunder; provided that each Party shall have the right to protest any such filing by the other Party and to participate fully in any proceeding before FERC in which such modifications may be considered. Nothing in this Agreement shall limit the rights of the Parties or of FERC under Sections 205 or 206 of the FPA and FERC's rules and regulations thereunder, except to the extent that the Parties otherwise mutually agree as provided herein.

4.19 Counterparts. This Agreement may be executed in one or more counterparts at different times, each of which shall be regarded as an original and all of which, taken together, shall constitute one and the same Agreement.

[Signature page to follow]



IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be duly executed on behalf of each by and through their authorized representatives as of the date hereinabove written.

California Independent System Operator Corporation

By: DocuSigned by:
Neil Millar
9236FA183EA64FB...

Name: Neil Millar

Title: Vice President Infrastructure and Ops Planning

Date: 4/6/2021

California Department of Water Resources

By: DocuSigned by:
Mike Ramsey
765AA90BFF584F9...

Name: Mike Ramsey

Title: Chief, Compliance and Regulatory Office

Date: 4/6/2021

DS
dch

DS
MS

DS
RH

Attachment 1**CDWR System One-Line Diagram
CONFIDENTIAL
(Section 2.2)****Critical Energy/ Electric Infrastructure Information Redacted
Pursuant to 18 C.F.R § 388.113**

**Critical Energy/ Electric Infrastructure Information Redacted
Pursuant to 18 C.F.R § 388.113**

Attachment 2
CAISO and CDWR Coordination
(Section 3.1)

1. Facility Interconnection Studies

Applicable standards: FAC-002-2

With respect to interconnections to CDWR facilities, CDWR will conduct interconnection studies pursuant to its facilities interconnection procedures and will provide facility interconnection information and study results to the CAISO. As appropriate, the CAISO will incorporate information from CDWR interconnection studies in its Generator Interconnection Deliverability Allocation Procedures (“GIDAP”) and TPP studies. CDWR and CAISO will jointly evaluate, coordinate and cooperate on interconnection studies. This agreement does not affect either (1) interconnections to the CAISO Controlled Grid facilities which will continue to be governed by the CAISO Tariff and Business Practice Manuals (“BPMs”), or (2) CDWR’s rights and responsibilities with respect to such interconnections.

2. Transmission Planning

Applicable standards: TPL-001-4; TPL-007-3 (through 9/30/2020); TPL-007-4 (effective date starting 10/1/2020 for R1, R2, R5, R9, and with other requirements having later effective dates, spanning from 7/1/2021 through 1/1/2024); WECC Regional Criteria TPL-001-WECC-CRT-3.2; WECC BES Inclusion Guideline, and ultimately TPL-001-5 (with a 7/1/2023 effective date).

CDWR will participate in the CAISO Transmission Planning Process (“TPP”). CDWR will submit to the CAISO the information about the CDWR system that the CAISO requires to undertake its TPP. The CAISO will undertake its TPP in accordance with its Tariff and BPMs. Consistent with CDWR’s responsibility to meet Reliability Standards applicable to a Transmission Planner and Transmission Owner, CDWR has the final responsibility and authority over implementing corrective actions, modifications or changes to its facilities.

TPL-007-3, and now TPL-007-4, pertain to transmission system planned performance for geomagnetic disturbance (GMD) events. CAISO as the Planning Coordinator, and CDWR as the Transmission Planner will identify their roles and responsibilities in a matrix identifying which entity will maintain models (i.e., GIC system models), participate in WECC-wide studies, or perform studies, needed to complete benchmark and supplemental GMD Vulnerability Assessments, and implement GMD measurement data processes.

3. SOL Methodology, SOLs, IROLs, and Stability Limits

Applicable standards: FAC-010-3, FAC-014-2

CAISO documents and shares its FAC-010-3 SOL Methodology for use in developing SOLs within its Planning Coordinator Area, and includes sharing its SOL Methodology with the CDWR system. If applicable, CDWR will establish and provide to CAISO SOLs for the CDWR system consistent with the CAISO SOL Methodology. CAISO will adopt SOLs for its Planning Coordinator Area, incorporating as appropriate the information provided by CDWR. CDWR will provide CAISO facility ratings for its BES equipment. CDWR will provide CAISO CDWR's list of multiple CDWR Adjacent System contingencies (if any) which result in stability limits on the CDWR system for use by the CAISO as appropriate in carrying out its responsibilities under FAC-014-2.

4. Modeling, Data, and Analysis

Applicable standards: MOD-031-2; MOD-032-1; MOD-033-1

MOD-031-2 Demand and Energy Data;
MOD-032-1 Data for Power System Modeling and Analysis;
MOD-033-1 Steady-State and Dynamic System Model Validation

CDWR will provide to CAISO CDWR's transmission system load and modeling data pursuant to the requirements of MOD-032-1 and the WECC Data Preparation Manual and CEC data collection requirements. The CAISO will include this data in its documentation for its Planning Coordinator Area and/or Balancing Authority Area, developed consistent with the NERC MOD Standards, the CAISO Tariff and BPMs, that identify the scope and details of the actual and forecast (a) Demand data, (b) Net Energy for Load data, and (c) controllable DSM data to be reported for system modeling data for power system modeling and reliability analyses. The CAISO will use the CDWR transmission system load and modeling data and models provided by CDWR as needed to meet its obligations under MOD-031-2, MOD-032-1, and MOD-033-1. There is currently no Direct Control Load Management (DCLM) load data on the CDWR system.

5. Underfrequency Load Shedding (UFLS)

Applicable standards and regional criteria: PRC-006-3, WECC Regional Criteria PRC-006-WECC-CRT-3, and the NERC Standard PRC-006-5 WECC Regional Variance (when it becomes effective).

CDWR will participate in and/or provide information as necessary to WECC to be used as part of the WECC Off-Nominal Frequency Load Shedding Plan and for CAISO's studies and activities related to PRC-006-3 WECC Regional Variance, the WECC

Regional Criteria PRC-006-WECC-CRT-3, & ultimately PRC-006-5 WECC Regional Variance.

6. Transmission Relay Loadability

Applicable standard: PRC-023-4

CAISO will include the CDWR BES Facilities covered by this Agreement in its Transmission Register as non-PTO facilities and will include such facilities in its determination of assessments required under PRC-023-4 R6. Upon request, CDWR will provide facilities information needed by CAISO to perform its PRC-023-4 R6 evaluations. The CAISO will assist CDWR in obtaining access to the CAISO's Transmission Register.

7. Additional Protection and Control (PRC) Standards

Applicable standards: PRC-010-2; PRC-026-1 R1 (1/1/2018), PRC-012-2 (1/1/2021)

- PRC-010-2 Undervoltage Load Shedding (UVLS) (4/2/2017), if applicable;
- PRC-026-1 R1 (1/1/2018) Relay Performance During Stable Power Swings;
- PRC-012-2 Remedial Action Schemes (1/1/2021 Effective Date).

If PRC-010-2 is applicable to CDWR, CDWR will provide any relevant information to CAISO in compliance with PRC-010-2 (UVLS).

PRC-026-1 is to ensure that load-responsive protective relays are expected to not trip in response to stable power swings during non-Fault conditions. Refer to Attachment A in the standard, and in particular, Criterion 4. An Element identified in the most recent annual Planning Assessment where relay tripping occurs due to a stable or unstable power swing during a simulated disturbance. Also refer to the Application Guidelines in the standard. Requirement R1 is applicable to the Planning Coordinator, and Requirements R2 through R4 are applicable to the Generator Owner and Transmission Owner.

PRC-012-2 is to ensure that Remedial Action Schemes (RAS) do not introduce unintentional or unacceptable reliability risks to the BES. Under Requirement R4, the Planning Coordinator, at least once every five full calendar years, shall perform an evaluation of each RAS within its planning area. The R4 RAS evaluation within the ISO Planning Coordinator area began in 2020 per the PRC-012-2 R4 scope and schedule identified in the scope document, with PC and TO/TP input, and will be performed over the allowed five-year period. The PC is to provide year-end results of the RAS evaluation to the RC, RAS-entity (i.e., TO, GO, DP), impacted TP(s) and PC(s) by year end. CDWR does not currently own any RAS, so PRC-012-2 would not currently apply to CDWR.

8. Outage Coordination

Applicable standard: IRO-017-1 Requirements R3 & R4 (4/1/2017)

Requirement R3 requires the CAISO as the Planning Coordinator and CDWR as the Transmission Planner to provide its Planning Assessment to the impacted Reliability Coordinator (RC West).

Requirement R4 requires each Planning Coordinator and Transmission Planner to jointly develop solutions with its respective Reliability Coordinator (RC West) for identified issues or conflicts with planned outages in its Planning Assessment for the Near-Term Transmission Planning Horizon.

9. Nuclear

NUC-001-3 is applicable to the CAISO as a Planning Coordinator and to its Planning Coordinator Area, as the PG&E Diablo Canyon Nuclear Power Plant, located in PG&E's service area, is part of the CAISO Controlled Grid.

10. Cyber Security Standards

Applicable Standards:

CIP-002-5.1a – Cyber Security – BES Cyber System Categorization
Medium Impact Rating (M) Attachment 1 Criteria 2.3, 2.6, and 2.9, if applicable;

and possibly CIP-014-2 R2 Physical Security (**only if** the Planning Coordinator is requested by the Transmission Owner to be the unaffiliated third party to verify the Transmission Owner's risk assessment performed in R1.)



Attachment 3 Calculation of Annual Service Fee For 2021 (Section 4.1.1)



Long Term Transmission Planning Cost Calculation

Reference Documents
2019 Cost of Service Study and 2021 GMC Update
<http://www.caiso.com/informed/Pages/StakeholderProcesses/Budget-GridManagementCharge.aspx>

Cost of Long Term Transmission Planning (LTPP)
(amounts in thousands)

Component	Code	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect	Amount	LTPP Factor	Allocation to LTPP	Identifier
Allocation of Direct Costs (ABC Level 2 Activities)										
<u>Develop Infrastructure</u>										
Develop & Monitor Regulatory Contract Procedures	201	95%			5%		\$ 644	0%	\$ -	
Manage Generator Interconnection Agreements (GIA)	202		100%				\$ 319	0%	-	
Manage Generator Interconnection Process (GIP)	203		100%				\$ 2,765	0%	-	
Manage Long Term Transmission Planning	204		100%				\$ 6,618	50%	3,309	
Manage Transmission and Resource Implementation	205		100%				\$ 685	0%	-	
Manage Transmission Maintenance Standards	206		100%				\$ 514	0%	-	
NERC/ WECC Loads & Resources Data Requests	207		100%				\$ 247	0%	-	
Seasonal Assessment	208		100%				\$ 284	0%	-	
Manage Queue	209		100%				\$ 786	0%	-	
Manage Annual Delivery Assessment	210		100%				\$ 1	0%	-	
Total LTPP Direct Costs									\$ 3,309	(1)
<i>Note: Information pulled from the 2019 Cost of Service Study.</i>										
Allocation of Indirect Costs										
Total Direct Net System Operations Costs (before allocation of indirect costs)									\$ 43,934	(2)
Percentage of LTPP costs to ABC level 2 Direct Costs									7.53%	(3)
Total System Operations Indirect Dollars Allocated									\$ 44,116	(4)
Total LTPP Indirect Costs									\$ 3,323	(5)
Total Long Term Transmission Planning Costs									\$ 6,632	(6)
<i>Note: Information pulled from the 2016 Cost of Service Study Work Papers (page 1)</i>										
Annual Planning Coordinator Service Charge Calculation										
Total number of transmission circuits in ISO 2019 Transmission Plan									1,571	(7)
LTPP cost per transmission circuit in ISO 2019 Transmission Plan									\$ 4.22	(8)
Total number of transmission circuits in CDWR's system									4	(9)
Annual Planning Coordinator Service Charge (\$ in 1000s)									\$ 16.885	(10)

Attachment 4
Notices & Authorized Representatives
(Sections 4.1.3, 4.11)

1. As to the CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION:

Authorized Representative:

Jeffrey Billinton
Director, Transmission Infrastructure Planning
California Independent System Operator Corporation
250 Outcropping Way
Folsom, CA 95630
Phone: (916) 608-7126
Email: jbillinton@caiso.com

Contract Administration:

Attn: Regulatory Contracts
Phone: (916) 351-4400
Email: RegulatoryContracts@caiso.com

CDWR Payments:

Submit payments to

CAISO Accounting
250 Outcropping Way
Folsom, CA 95630

Bank Wiring Instructions:
By Wire: Wells Fargo Bank, N.A.
ABA Routing #: 121000248
Account # 4122041783

2. As to the CALIFORNIA DEPARTMENT OF WATER RESOURCES

Authorized Representative:

Michael Ramsey
Chief, Compliance and Regulatory Branch
SWP Power and Risk Office
2135 Butano Drive, Suite 100
Sacramento, CA 95825
Phone: (916) 574-0313
Email: Mike.Ramsey@water.ca.gov

CAISO Invoices:

Submit invoices to CDWR

California Department of Water Resources
Power Settlements and Market Operations
Attn: Mark Thompson
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821
Phone: (916) 574-2215
Email: Mark.Thompson@water.ca.gov

Attachment B – Declaration of April Gordon
For the PCA between
California Departments of Water Resources
and the
California Independent System Operator Corporation
April 27, 2021

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

**California Independent System) Docket No. ER21-____-000
Operator Corporation)**

**DECLARATION OF APRIL GORDON
ON BEHALF OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION**

I, April Gordon, state as follows:

1. I am employed as the Director of Financial Planning and Procurement for the California Independent System Operator Corporation (the "CAISO"). My business address is 250 Outcropping Way, Folsom, California 95630. I am responsible for the CAISO's budget preparation and management; long term planning; corporate procurement and contract management. As part of my duties at the CAISO, I oversee the development of the CAISO's grid management charge.
2. I participated in the creation of the "2019 Cost of Service Study and 2021 GMC Update", attached as Exhibit 1 to my declaration, and the spreadsheets calculating estimated costs that the CAISO will incur to provide planning services to the California Department of Water Resources ("CDWR"), under the Planning Coordinator Agreement between the CAISO and CDWR, attached as Exhibit 2 to my declaration.
3. To the best of my knowledge, the information provided in Exhibits 1 and 2 is a true and accurate description and estimate of the costs that the

CAISO will incur in providing planning services to CDWR, under the Planning Coordinator Agreement between the CAISO and CDWR, in 2021 for each billing unit identified.

I hereby certify under penalty of perjury that the foregoing statements are true and correct to the best of my knowledge, information, and belief:

Executed on: April 27, 2021

/s/ April Gordon
April Gordon

Attachment B, Exhibit 1 – 2019 Cost of Service Study
For the PCA between
California Departments of Water Resources
and the
California Independent System Operator Corporation
April 27, 2021



California ISO

**2019 Cost of Service Study and
2021 GMC Update**

DRAFT FINAL

July 2020

Table of Contents

Executive Summary	3
Application of ABC to GMC and RC Rate Structure	6
Costing the 2019 GMC Revenue Requirement.....	16
Step 1: Breaking Out Non-ABC Support Costs	17
Step 2: Allocation of O&M Costs.....	18
Step 3: Allocating Remaining Revenue Requirement Components to Cost Categories.....	34
Step 4: Aggregating Revenue Requirement into Cost Categories	35
Step 5: Calculation of 2019 Rates Using New Cost Category Percentages	36
Summary of GMC Cost Category Percentage Changes.....	38
Energy Imbalance Market	39
Application of ABC to EIM Rate Structure	40
Mapping of Cost Categories to EIM Activities.....	40
Costing the Cost Categories to EIM Activities	49
Step 1: Applying EIM Activity Percentages to Non-ABC O&M Support Costs	50
Step 2: Applying EIM Activity Percentages to ABC Direct O&M Costs.....	51
Step 3: Allocating the Remaining Revenue Requirement Components	56
Step 4: Aggregating Revenue Requirement into Cost Categories and Allocating Fees.....	56
Step 5: Calculation of the EIM Components of the 2019 Cost Category Rates.....	57
Summary of EIM Cost Category Percentage Changes	58
Reliability Coordinator Services	59
Supplemental Fees	61
Transmission Ownership Rights	62
Application of ABC to TOR Fee Structure	63
Mapping and Costing of Cost Categories to TOR Activities.....	63
Summary of TOR Fee Changes.....	66
Application Fees	66
Scheduling Coordinator ID Administrative Fee	67

Executive Summary

The CAISO completed its scheduled triennial cost of service study (2019 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 effort staff uses to support varying cost categories and supplemental services. CAISO uses study results to update the GMC revenue requirement percentage allocations to the market services, system operations, and congestion revenue rights services (CRR services) cost categories (outlined in Table 1). The study results are also used to update the energy imbalance market (EIM) cost category percentages (outlined in Table 2) and the recently developed, the reliability coordinator (RC) funding percentage (outlined in Table 3). In addition, as part of the 2019 cost of service study, the CAISO analyzed its cost to support supplemental services (outlined in Table 4). The resulting percentage allocation changes and fee changes will be effective for the 2021 through 2023 GMC revenue requirement and grid management charges (GMC).

The 2019 cost of service study results as shown in Table 1 below indicate a 17% shift of resources (time and dollars) from the system operations cost category to the market services cost category; the CRR service cost category percentage remains the same. The shift from the system operations cost category to the market services cost category is primarily driven by process efficiencies, system improvements, the introduction of the RC services cost category, and automation of services. The shift indicates CAISO staff is focused on supporting market services functions and system operations functions equally.

Table 1 – Summary of GMC Cost Category Percentage Changes

Cost Category	2016 Study Effective 2018 GMC	2019 Study Effective 2021 GMC	Increase / (Decrease) from Prior
Market Services	32%	49%	17%
System Operations	66%	49%	-17%
CRR Services	2%	2%	0%

The results also indicate a shift of EIM related resources as well, shown highlighted in Table 2 below. The study shows that 16% of market services' resources shifted from the real time market functions to day ahead market functions. In addition, 11% of system operations' resources shifted from balancing authority functions to

real time dispatch functions. The driver of the shifts is a balancing of efforts between the market services and system operations functions and responsibilities.

Table 2 – Summary of EIM Cost Category Percentage Changes

Cost Category	Sub-Category	2016 Study Effective 2018 GMC	2019 Study Effective 2021 GMC	Increase / (Decrease) from Prior
Market Services	Real Time Market	79%	63%	-16%
	Day Ahead Market	21%	37%	16%
System Operations	Real Time Dispatch	39%	50%	11%
	Balancing Authority	61%	50%	-11%

New to the triennial cost of service study is the analysis of RC services efforts. CAISO implemented its RC services in 2019. The study results indicate there is no change in the RC funding percentage from that of the initial calculation as part of CAISO’s Reliability Coordinator Rate Design, Terms and Conditions proposal¹; the funding percentage will remain at 9%.

Table 3 – Summary of RC Funding Percentage Changes

Cost Category	2016 Modified Study Effective 2019 GMC	2019 Study Effective 2021 GMC	Increase / (Decrease) from Prior
Reliability Coordinator Services	9%	9%	0%

CAISO also used the 2019 cost of service study to analyze efforts that support other supplemental services. The study results indicate resources to process applications and statements increased. Whereas, resources to support transmission ownership rights (TOR) efforts decreased. CAISO is proposing changes to the Scheduling Coordinator ID fee, TOR fee, Scheduling Coordinator Application fee, and CRR Application fee based

¹ Visit the CAISO website for additional information regarding the [Reliability Coordinator Rate Design, Terms and Conditions proposal](#).

on the study. The revenue collected from the fees offset the costs recovered through either the GMC revenue requirement or the GMC rates. The CAISO is not proposing any other change in supplemental fees.

Table 4 – Summary of Supplemental Fee Changes

Fee	Billing Units	Current Fee	Updated Fee
Bid Segment Fee	per bid segment	\$ 0.0050	No Change
Inter SC Trade Fee	per Inter SC Trade	\$ 1.0000	No Change
Scheduling Coordinator ID Fee	per month	\$ 1,000	\$ 1,500
TOR Fees	minimum of supply or demand TOR MWh	\$ 0.2400	\$ 0.1800
CRR Bid Fee	number of nominations and bids	\$ 1.00	No Change
Intermittent Resource Forecasting Fee	per MWh	\$ 0.1000	No Change
Scheduling Coordinator Application Fee	per application	\$ 5,000	\$ 7,500
CRR Application Fee	per application	\$ 1,000	\$ 5,000
HANA Administrative Fee	annual fee	\$ 45,000	No Change
HANA Setup Fee	one time fee	\$ 35,000	No Change

Other Tariff Amendments

Additionally, CAISO seeks to clarify in the Tariff the administrative process around the self-insured healthcare reserve. In 2018, CAISO converted a portion of its healthcare benefit program to a self-insured model. The intent of the program was to help CAISO and its employees mitigate the effects of rising healthcare costs. A self-insured health insurance program shifts the financial risk of paying health insurance claims to the employer versus the health insurance company. The benefits to the employer include more control over the design of the health insurance plan and saving the profit margin that insurance companies add to their premiums.

CAISO works with a health benefit consultant annually to determine the appropriate amount of premiums to assess the users of the plan given expected claims data. The original intent of the self-insured program was to enable the CAISO to be able to build a reserve in years in which actual claims were less than expected and to use those reserves in years in which claims exceeded expectations. This would smooth out the volatility associated with healthcare claims.

It is not clear in the existing tariff whether CAISO is able to hold back the reserve from the operating cost reserve adjustment that is performed each year to fund the self-insured healthcare reserve. The operating cost

reserve adjustment ensures that any excess or shortfall in any category that makes up the revenue requirement is accounted for in the annual rate development. Although the CAISO originally believed that the healthcare reserve could be established using the existing budgeting processes, the effect on the Tariff operating cost reserve adjustment process is not clear and therefore, CAISO will add specific language describing the annual healthcare reserve process.

Changes from the Straw Proposal

The content of this draft final is primarily the same as the straw proposal. All percentage allocations and fee changes that resulted from the updated cost of service study remain the same. This paper does provide additional explanations of the GMC cost category percentage shifts and the calculation of the Schedule Coordinator ID Fee as provided in response to stakeholder comments².

Application of ABC to GMC and RC Rate Structure

The CAISO used activity based costing (ABC) for the first cost of service study to restructure the GMC rate design in 2011. The GMC design 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, processes and time 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 CAISO incurs for running the markets. The system operations category is designed to recover costs CAISO incurs for reliably operating the grid in real time.

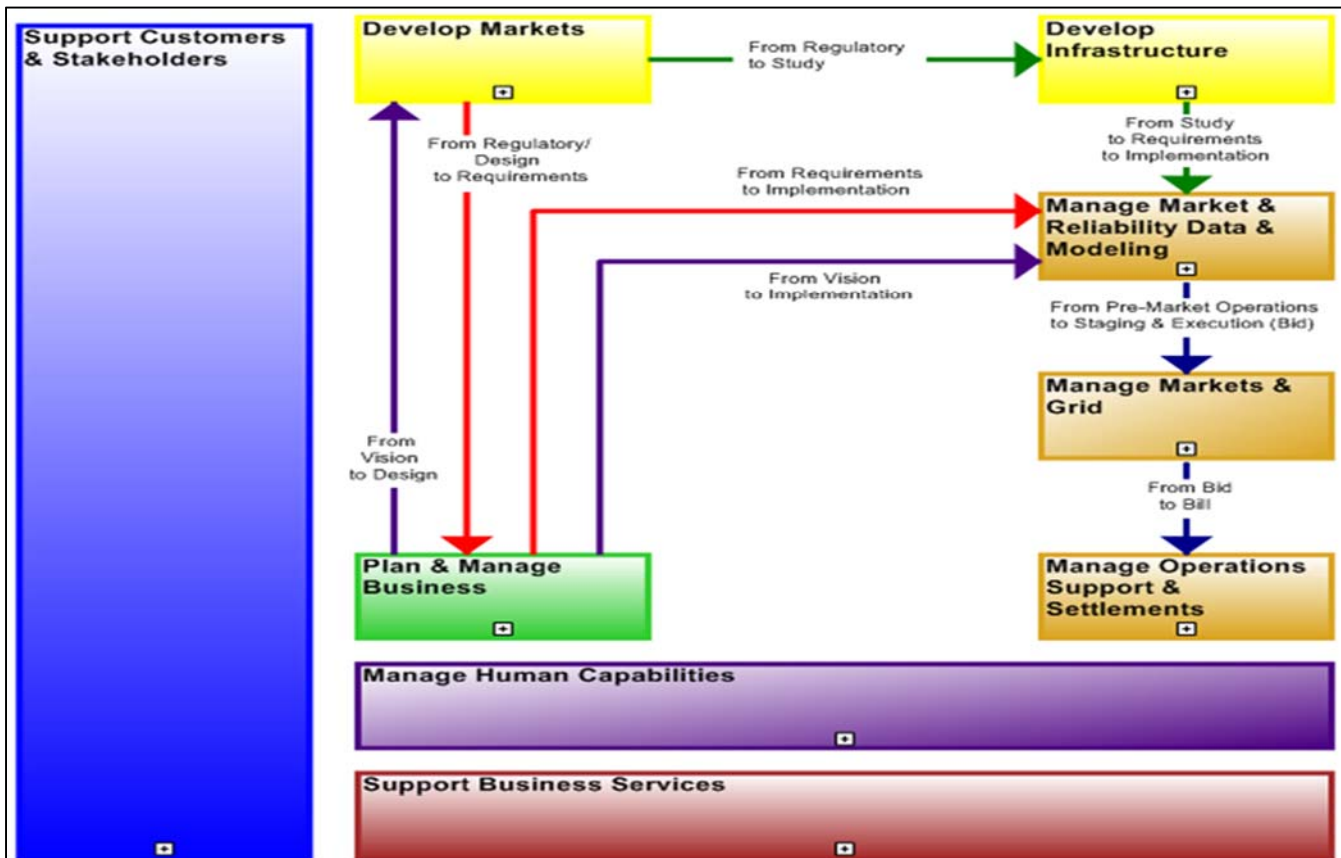
² Visit the CAISO website for additional information regarding the [2019 Cost of Service Study and 2021 GMC Update](#) stakeholder comments.

The CRR services category recovers costs 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 EIM entities pay. Market services is bifurcated between real time market resources and day ahead market resources. While, system operations is split between real time dispatch resources and balancing area authority services. EIM entities pay the percentage of GMC associated with real time market and real time dispatch resources.

The 2019 cost of service study includes a new cost category, reliability coordinator, 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 in that 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 the RC customers and the existing GMC customers.

Mapping of ISO 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 107 level 2 activities included in the 2019 cost of service study.

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 March 2020. 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 5 — Level 1 ABC Activities

ABC Process Code	Level 1 ABC Activity	Number of Level 2 Activity Tasks
Direct		
80001	Develop Infrastructure	10
80002	Develop Markets	9
80004	Manage Market & Reliability Data & Modeling	10
80005	Manage Market & Grid	6
80007	Manage Operations Support & Settlements	12
80008	Plan & Manage Business	12
80009	Support Business Services	34
80010	Support Customers & Stakeholders	6
	Total	99
Indirect		
80003	Manage Human Capabilities	8
9	Total	107

MAPPING OF ABC DIRECT OPERATING ACTIVITIES

Direct operating activities were defined, linked to specific processes, and measured using the 12 standard percentage allocations presented below.

Table 6 — Mapping of ABC Direct Operating Activities to Cost Categories

Option	Standard Cost Category Percentage Allocations			
	1	2	3	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%	

2019 Modified Revenue Requirement: ABC Direct Operating Activities

GMC

Code	ABC Level 2 Activities	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect	Comments
<i>cost category % allocation</i>							
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.
210	Manage Annual Delivery Assessment		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.
227	Manage Tariff Amendments					100%	Attributes are not distinguishable to any specific category.
228	Manage Post Order, Rehearing, and Compliance					100%	Attributes are not distinguishable to any specific category.
229	Develop State / Federal Regulatory Policy	40%	60%				Efforts predominately support system operations functions; as well as those of market services on a smaller scale.
230	BPM Change 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.
231	Develop Infrastructure Policy	40%	60%				Efforts predominately support system operations functions; as well as those of market services on a smaller scale.
232	Perform Market Analysis	80%	15%	5%			Efforts predominately support market services functions; as well as those of system operations and RC services on a smaller scale.
233	Develop Market Design	100%					Efforts are entirely to support the market results and function.
234	Manage Regulatory Contract Negotiations	95%			5%		Efforts primarily support system operations functions and RC service functions on a smaller scale.
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.

2019 Modified Revenue Requirement: ABC Direct Operating Activities

GMC

Code	ABC Level 2 Activities	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect	Comments
<i>cost category % allocation</i>							
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.
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%					Efforts support market services functions entirely.
411	Manage Market Clearing	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.
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.
413	Manage Reliability Must Run Settlements		100%				Efforts support reliability on the grid thus the costs are entirely to support system operations functions.
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.
467	Research & Proof of Concept					100%	Attributes are not distinguishable to any specific category.
469	Manage Project & Effort Lifecycles					100%	Attributes are not distinguishable to any specific category.

2019 Modified Revenue Requirement: ABC Direct Operating Activities

GMC

Code	ABC Level 2 Activities	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect	Comments
<i>cost category % allocation</i>							
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.
530	Manage Dispute Resolution					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.
554	Monitor & Maintain Backups					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 7 — Mapping of Non-ABC Support Costs to Cost Categories

2019 Modified Revenue Requirement: Non-ABC Support Costs						
Component	GMC			Reliability Coordinator	Indirect	Comments
	Market Services	System Operations	CRR Services			
<i>cost category % allocation</i>						
Non-ABC Support Costs						
Corporate Services Divisions						
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.
SSAE 16 Audit	45%	45%	5%	5%		Use Process 80007, Task 412 allocations.
Market and Infrastructure Development Division (MID)						
Market Surveillance Committee	80%	15%	5%			Use Process 80002, Task 232 allocations.
Technology Division (TECH)						
Hardware and Software Maintenance and Equipment					100%	Attributes are not distinguishable to any specific category.
Intermittent Resource Forecasting Costs	80%	15%		5%		Use Process 80005, Task 353 allocations.
Occupancy					100%	Attributes are not distinguishable to any specific category.
Reliability Coordinator Tools				100%		Use Process 80005, Task 370 allocations.
Telecommunications					100%	Attributes are not distinguishable to any specific category.
Market Quality and California Regulatory Affairs Division (MQCRA)						
Intermittent Resource Forecasting Costs	80%	15%		5%		Use Process 80005, Task 353 allocations.
General Counsel Division (GC)						
Operations Audit	24%	52%		24%		Use Process 80005 total allocations.
Outside Legal					100%	Attributes are not distinguishable to any specific category.

MAPPING OF ABC INDIRECT ACTIVITIES

ABC support activities were allocated to indirect costs.

Table 8 — Mapping of ABC Indirect Activities to Cost Categories

2019 Modified Revenue Requirement: ABC Indirect Costs						
Component	GMC			Reliability Coordinator	Indirect	Comments
	Market Services	System Operations	CRR Services			
<i>cost category % allocation</i>						
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 2013 bonds. The 2013 bonds refunded the 2009 bonds, which funded the building of 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 9 — Mapping of Debt Service and Capital to Cost Categories

2019 Modified Revenue Requirement: 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. As well as for feasibility studies. 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 10 — Mapping of Other Revenue to Cost Categories

2019 Modified Revenue Requirement: Other Costs and Revenue						
Component	GMC			Reliability		Comments
	Market Services	System Operations	CRR Services	Coordinator	Indirect	
cost category % allocation						
Other Costs and Revenue						
California-Oregon Intertie Path Operator Fees		100%				Fees offset system operations costs.
Energy Imbalance Market Administration Charges					100%	Attributes are not distinguishable to any specific category.
Interest Earnings					100%	Attributes are not distinguishable to any specific category.
Intermittent Resource Forecasting Fees	80%	15%		5%		Use Process 80005, Task 353 allocations.
Generator Interconnection Project Fees and Application Fees		100%				Use Process 80001, Task 203 allocations.
HANA Administrative Fees*				100%		Use Process 80005, Task 370 allocations.
Metered Sub-Station Penalties					100%	Attributes are not distinguishable to any specific category.
Planning Coordinator Fees		100%				Use Process 80001, Task 204 allocations.
SC Application Fees					100%	Attributes are not distinguishable to any specific category.
Reliability Coordinator Funding Requirement*				100%		Use Process 80005, Task 370 allocations.
* Modifications were made to the 2019 Revenue Requirement to include HANA Administrative Fees and a full year's worth of Reliability Coordinator Funding Requirement as these services were not or partially included in the original 2019 Revenue Requirement. As a reminder, the CAISO began offering Reliability Coordinator services July 1, 2019.						

Table 11 — Mapping of Operating Cost Reserve Adjustment to Cost Categories

2019 Modified Revenue Requirement: Operating Cost Reserve Adjustment						
Component	GMC			Reliability		Comments
	Market Services	System Operations	CRR Services	Coordinator	Indirect	
cost category % allocation						
Operating Cost Reserve Adjustment						
Adjustment in 15% Reserve for O&M					100%	
25% Debt Service Reserve for 2013 Bonds					100%	
Revenue Changes					100%	
Expense Changes					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.

Costing the 2019 GMC Revenue Requirement

The CAISO applied the allocation matrix of level 2 activities to the 2019 revenue requirement to determine the costs associated with the cost categories. Modifications were made to the other costs and revenue category to include HANA administrative fees and a full year's worth of reliability coordinator (RC) funding requirement as these services were not included, in the case of HANA administrative fees, or partially included, in the case of the RC funding requirement, in the original 2019 revenue requirement. As a reminder, the CAISO began offering RC services July 1, 2019. The 2019 revenue requirement data and employee hours are the most recent information available to both determine the cost category percentage updates for the 2021 GMC tariff filing.

Table 12 — 2019 Modified GMC Revenue Requirement Components

2019 Modified GMC Revenue Requirement	
Components	Budget (\$ in thousands)
Operations and Maintenance	\$ 189,030
Debt Service	\$ 16,904
Cash Funded Capital	\$ 25,000
Other Costs and Revenues	\$ (38,662)
Operating Costs Reserve Adjustment	\$ (13,480)
Total	\$ 178,792

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
 5. Dividing resulting costs by estimated volumes to determine 2019 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, and non-ABC costs such as facilities costs. The O&M budget was broken down into those two categories. The significant non-ABC support costs were removed from the divisions and allocated separately.

Table 13 — Allocation of Costs to ABC Activities and Non-ABC Activities

2019 Operations and Maintenance Budget (\$ in thousands)			
Division	ABC Activity Costs	Non-ABC Activity Costs	Total
Corporate Services	\$ 14,631	\$ 5,683	\$ 20,314
Market and Infrastructure Development	\$ 16,514	314	\$ 16,828
Technology	\$ 45,464	24,921	\$ 70,385
Operations	\$ 47,457	-	\$ 47,457
General Counsel	\$ 11,943	2,726	\$ 14,669
Market Quality and California Regulatory Affairs	\$ 8,609	355	\$ 8,964
External and Customer Affairs	\$ 10,413	-	\$ 10,413
Total	\$ 155,031	\$ 33,999	\$ 189,030

These budgeted costs were allocated using the percentages shown in *Table 7 — Mapping of Non-ABC Support Costs to Cost Categories*.

Table 14 — Allocation of Non-ABC Support Costs to Cost Categories

2019 Modified Revenue Requirement: Non-ABC Support Costs											
Component	GMC					2019 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)				
Non-ABC Support Costs											
Corporate Services Divisions											
Bank Fees					100%	\$ 430	\$ -	\$ -	\$ -	\$ -	\$ 430
HR Support					100%	\$ 2,392	\$ -	\$ -	\$ -	\$ -	\$ 2,392
Insurance					100%	\$ 2,301	\$ -	\$ -	\$ -	\$ -	\$ 2,301
SSAE 16 Audit	45%	45%	5%	5%		\$ 560	\$ 252	\$ 252	\$ 28	\$ 28	\$ -
Corporate Services Division Total						\$ 5,683	\$ 252	\$ 252	\$ 28	\$ 28	\$ 5,123
Market and Infrastructure Development Division (MID)											
Market Surveillance Committee	80%	15%	5%			\$ 314	\$ 251	\$ 47	\$ 16	\$ -	\$ -
MID Total						\$ 314	\$ 251	\$ 47	\$ 16	\$ -	\$ -
Technology Division (TECH)											
Hardware and Software Maintenance and Equipment					100%	\$ 12,630	\$ -	\$ -	\$ -	\$ -	\$ 12,630
Intermittent Resource Forecasting Costs	80%	15%		5%	100%	\$ 986	\$ 789	\$ 148	\$ -	\$ 49	\$ -
Occupancy					100%	\$ 5,624	\$ -	\$ -	\$ -	\$ -	\$ 5,624
Reliability Coordinator Tools				100%		\$ 1,015	\$ -	\$ -	\$ -	\$ 1,015	\$ -
Telecommunications					100%	\$ 4,666	\$ -	\$ -	\$ -	\$ -	\$ 4,666
Technology Total						\$ 24,921	\$ 789	\$ 148	\$ -	\$ 1,064	\$ 22,920
Market Quality and California Regulatory Affairs Division (MQCRA)											
Intermittent Resource Forecasting Costs	80%	15%		5%		\$ 355	\$ 284	\$ 53	\$ -	\$ 18	\$ -
MQCRA Total						\$ 355	\$ 284	\$ 53	\$ -	\$ 18	\$ -
General Counsel Division (GC)											
Operations Audit	24%	52%		24%		\$ 126	\$ 30	\$ 66	\$ -	\$ 30	\$ -
Outside Legal					100%	\$ 2,600	\$ -	\$ -	\$ -	\$ -	\$ 2,600
General Counsel Total						\$ 2,726	\$ 30	\$ 66	\$ -	\$ 30	\$ 2,600
Total Non-ABC Support Costs						\$ 33,999	\$ 1,606	\$ 566	\$ 44	\$ 1,140	\$ 30,643

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 5 — 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 6 — Mapping of ABC Direct Operating Activities to Cost Categories*. The level 1 support activities were allocated to ABC support costs.

The O&M budget is comprised of approximately 111 cost centers. The reported 2019 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 15 — Allocation of Division Hours to Direct Operating Activities

ABC Process Code	Level 1 ABC Activity	Allocation of Hours By Division							Total
		Corporate Services	Market and Infrastructure Development	Technology	Operations	General Counsel	Market Quality and California Regulatory Affairs	External and Customer Affairs	
Direct									
80001	Develop Infrastructure	4%	92%	0%	2%	0%	1%	1%	100%
80002	Develop Markets	0%	50%	0%	6%	9%	34%	0%	100%
80004	Manage Market & Reliability Data & Modeling	5%	1%	23%	62%	0%	3%	6%	100%
80005	Manage Market & Grid	0%	0%	4%	96%	0%	1%	0%	100%
80007	Manage Operations Support & Settlements	2%	0%	5%	77%	0%	15%	2%	100%
80008	Plan & Manage Business	7%	0%	87%	0%	6%	0%	0%	100%
80009	Support Business Services	13%	0%	71%	1%	15%	0%	0%	100%
80010	Support Customers & Stakeholders	0%	1%	0%	1%	0%	10%	88%	100%
	Total	6%	10%	33%	35%	5%	4%	6%	100%

The hours were then aggregated by level 2 activity.

Table 16 — Allocation of Division Hours to Level 2 Activities

		Allocation of Hours By Division							
Code	ABC Level 2 Activities	Corporate Services	Market and Infrastructure Development	Technology	Operations	General Counsel	Market Quality and California Regulatory Affairs	External and Customer Affairs	Total
80001 Develop Infrastructure (DI)									
201	Develop and Monitor Regulatory Contract Procedures	0%	93%	0%	0%	0%	0%	7%	100%
202	Manage Generator Interconnection Agreements	0%	100%	0%	0%	0%	0%	0%	100%
203	Manage Generator Interconnection Process	16%	84%	0%	0%	0%	0%	0%	100%
204	Manage Long Term Transmission Planning	0%	100%	0%	0%	0%	0%	0%	100%
205	Manage New Transmission Resources	0%	30%	0%	50%	0%	19%	0%	100%
206	Manage Transmission Maintenance Standards	0%	100%	0%	0%	0%	0%	0%	100%
207	Manage Load Resource Data	0%	100%	0%	0%	0%	0%	0%	100%
208	Seasonal Assessment	0%	91%	0%	0%	0%	9%	0%	100%
209	Manage Queue Management	0%	100%	0%	0%	0%	0%	0%	100%
210	Manage Annual Delivery Assessment	0%	100%	0%	0%	0%	0%	0%	100%
10	Total DI	4%	92%	0%	2%	0%	1%	1%	100%
80002 Develop Markets (DM)									
226	Manage Regulatory Filings	0%	0%	0%	0%	100%	0%	0%	100%
227	Manage Tariff Amendments	0%	0%	0%	0%	100%	0%	0%	100%
228	Manage Post Order, Rehearing, and Compliance	0%	0%	0%	0%	100%	0%	0%	100%
229	Develop State / Federal Regulatory Policy	0%	15%	0%	85%	0%	0%	0%	100%
230	BPM Change Management	0%	29%	0%	71%	0%	0%	0%	100%
231	Develop Infrastructure Policy	0%	90%	0%	8%	0%	2%	0%	100%
232	Perform Market Analysis	0%	5%	0%	0%	0%	95%	0%	100%
233	Develop Market Design	0%	87%	0%	0%	0%	13%	0%	100%
234	Manage Regulatory Contract Negotiations	0%	100%	0%	0%	0%	0%	0%	100%
9	Total DM	0%	50%	0%	6%	9%	34%	0%	100%

		Allocation of Hours By Division								
Code	ABC Level 2 Activities	Corporate Services	Market and Infrastructure Development	Technology	Operations	General Counsel	Market Quality and California Regulatory Affairs	External and Customer Affairs	Total	
80004 Manage Market & Reliability Data & Modeling (MMR)										
301	Manage Full Network Model Maintenance	0%	0%	86%	14%	0%	0%	0%	100%	
302	Plan & Develop Operations Simulator Training	0%	0%	1%	99%	0%	0%	0%	100%	
304	EMAA Telemetry	0%	0%	0%	100%	0%	0%	0%	100%	
307	Manage Congestion Revenue Rights	0%	0%	0%	100%	0%	0%	0%	100%	
308	Manage Credit & Collateral	100%	0%	0%	0%	0%	0%	0%	100%	
309	Resource Management	0%	0%	0%	100%	0%	0%	0%	100%	
310	Manage Reliability Requirements	0%	18%	0%	65%	0%	17%	0%	100%	
311	Manage Operations Planning	0%	0%	0%	100%	0%	0%	0%	100%	
312	Manage WECC Studies	0%	0%	0%	100%	0%	0%	0%	100%	
314	Manage & Facilitate Procedure Maintenance	0%	0%	0%	100%	0%	0%	0%	100%	
316	Plan & Develop Operations Training	0%	0%	0%	98%	0%	2%	0%	100%	
317	Execute & Track Operations Training	0%	0%	0%	100%	0%	0%	0%	100%	
320	Provide Stakeholder Training	0%	0%	0%	2%	0%	0%	98%	100%	
321	Schedule Coordinator Management	0%	10%	0%	0%	0%	0%	90%	100%	
322	Register, Modify and Terminate PDR Resource	0%	0%	0%	100%	0%	0%	0%	100%	
323	Calculate & Monitor Energy Costs & Indices	31%	0%	0%	0%	0%	69%	0%	100%	
10	Total MMR	5%	1%	23%	62%	0%	3%	6%	100%	
80005 Manage Market & Grid (MMG)										
352	Manage Day Ahead Market Support	0%	0%	4%	36%	0%	60%	0%	100%	
353	Operations Real Time Support	0%	0%	78%	20%	0%	2%	0%	100%	
355	Outage Model & Management	0%	0%	0%	100%	0%	0%	0%	100%	
360	Real Time Operations	0%	0%	0%	100%	0%	0%	0%	100%	
362	Manage Operations Engineering Support	0%	0%	0%	100%	0%	0%	0%	100%	
367	Manage Operations Compliance & Event Analysis	0%	0%	0%	100%	0%	0%	0%	100%	
368	Manage Day Ahead and Market Operations	0%	0%	0%	100%	0%	0%	0%	100%	
370	Manage Real Time Reliability Coordination	0%	0%	0%	100%	0%	0%	0%	100%	
6	Total MMG	0%	0%	4%	96%	0%	1%	0%	100%	

		Allocation of Hours By Division							
Code	ABC Level 2 Activities	Corporate Services	Market and Infrastructure Development	Technology	Operations	General Counsel	Market Quality and California Regulatory Affairs	External and Customer Affairs	Total
80007 Manage Operations Support & Settlements (MOS)									
401	Perform Market Validation	0%	0%	0%	100%	0%	0%	0%	100%
402	Manage Dispute Analysis & Resolution	0%	0%	5%	95%	0%	0%	0%	100%
403	Manage Market Quality System	0%	0%	53%	47%	0%	0%	0%	100%
406	Manage Rules of Conduct	0%	0%	0%	100%	0%	0%	0%	100%
409	Meter Data Acquisition and Processing	0%	0%	0%	100%	0%	0%	0%	100%
411	Manage Market Clearing	100%	0%	0%	0%	0%	0%	0%	100%
412	Manage Market Billing & Settlements	0%	0%	0%	91%	0%	0%	9%	100%
413	Manage Reliability Must Run Settlements	0%	0%	0%	0%	0%	0%	100%	100%
414	Manage Settlements Quarterly Release Cycle	0%	0%	0%	100%	0%	0%	0%	100%
417	Perform Market Report	0%	0%	0%	47%	0%	53%	0%	100%
418	Manage Good Faith Negotiation Requests	0%	0%	0%	0%	54%	0%	46%	100%
419	Manage Price Corrections	0%	0%	0%	24%	0%	76%	0%	100%
12	Total MOS	2%	0%	5%	77%	0%	15%	2%	100%
80008 Plan & Manage Business (PMB)									
451	Manage Financial Planning	98%	0%	0%	0%	0%	2%	0%	100%
452	Manage Application, Environment & Infrastructure	0%	0%	100%	0%	0%	0%	0%	100%
453	Manage Resource Allocation	0%	0%	100%	0%	0%	0%	0%	100%
454	Project Portfolio Management	0%	0%	99%	1%	0%	0%	0%	100%
455	Manage Technology Collaboration (Internal)	0%	0%	100%	0%	0%	0%	0%	100%
457	Manage Annual Functional Release Lifecycle	0%	0%	100%	0%	0%	0%	0%	100%
459	Enterprise Risk Management	0%	0%	0%	0%	100%	0%	0%	100%
461	Perform Board Processes	3%	3%	0%	0%	91%	0%	3%	100%
462	Manage Technology Collaboration (External)	0%	0%	100%	0%	0%	0%	0%	100%
466	Manage Corporate Goal Alignment and Reporting	0%	0%	31%	0%	69%	0%	0%	100%
467	Research & Proof of Concept	0%	0%	100%	0%	0%	0%	0%	100%
469	Manage Project & Effort Lifecycles	0%	0%	100%	0%	0%	0%	0%	100%
12	Total PMB	7%	0%	87%	0%	6%	0%	0%	100%

		Allocation of Hours By Division							Total
Code	ABC Level 2 Activities	Corporate Services	Market and Infrastructure Development	Technology	Operations	General Counsel	Market Quality and California Regulatory Affairs	External and Customer Affairs	Total
80009 Support Business Services (SBS)									
501	Manage Monthly Financial Cycle	100%	0%	0%	0%	0%	0%	0%	100%
502	Invest Corporate Funds	100%	0%	0%	0%	0%	0%	0%	100%
503	Manage Financial Reporting	98%	0%	0%	0%	2%	0%	0%	100%
504	IT Application, System, & Non-Production Support	0%	0%	100%	0%	0%	0%	0%	100%
505	IT Asset Management	0%	0%	100%	0%	0%	0%	0%	100%
508	IT Configuration, Change & Release Management	0%	0%	99%	1%	0%	0%	0%	100%
510	IT Event Management	0%	0%	100%	0%	0%	0%	0%	100%
511	IT Incident Management	0%	0%	100%	0%	0%	0%	0%	100%
512	IT Information Security Management	0%	0%	100%	0%	0%	0%	0%	100%
513	IT Problem & Risk Lifecycle Management	0%	0%	100%	0%	0%	0%	0%	100%
519	Provision and Manage Access	0%	0%	100%	0%	0%	0%	0%	100%
520	Manage Facilities, Physical Security, & Safety	0%	0%	100%	0%	0%	0%	0%	100%
521	Facilities Incident Management	0%	0%	100%	0%	0%	0%	0%	100%
522	Corporate Incident Response & Disaster Recovery	13%	0%	1%	33%	45%	0%	7%	100%
523	Manage Business Continuity Plan	3%	1%	84%	9%	1%	0%	1%	100%
528	Procurement & Vendor Management	99%	0%	1%	0%	0%	0%	0%	100%
529	Provide Legal Advice	0%	0%	0%	0%	100%	0%	0%	100%
530	Manage Dispute Resolution	0%	0%	12%	0%	88%	0%	0%	100%
533	Manage Evidence Review / Audit	0%	0%	50%	50%	0%	0%	0%	100%
535	Tariff Controls Monitoring	0%	0%	6%	0%	94%	0%	0%	100%
536	Manage Internal Audit	0%	0%	1%	0%	99%	0%	0%	100%
537	Monitor Markets	98%	0%	0%	2%	0%	0%	0%	100%
538	Manage Tariff Rules Violations	80%	0%	0%	0%	20%	0%	0%	100%
543	Market Design	100%	0%	0%	0%	0%	0%	0%	100%
544	Maintain DMM Database	100%	0%	0%	0%	0%	0%	0%	100%
545	Manage Business Process & Continuous Improvement	0%	0%	81%	19%	0%	0%	0%	100%
546	Records Management	4%	4%	2%	7%	83%	0%	0%	100%
548	Manage Compliance Standards Development and Implementation	0%	17%	35%	31%	17%	0%	0%	100%
549	Manage Compliance Investigations	0%	0%	13%	0%	87%	0%	0%	100%
550	Manage NERC Compliance	0%	6%	8%	1%	85%	0%	0%	100%
552	IT Reports & Documentation	0%	0%	100%	0%	0%	0%	0%	100%
553	Manage Vulnerability Remediation	0%	0%	100%	0%	0%	0%	0%	100%
554	Monitor & Maintain Backups	0%	0%	100%	0%	0%	0%	0%	100%
555	Manage Root Cause Analysis	0%	0%	0%	92%	8%	0%	0%	100%
34	Total SBS	13%	0%	71%	1%	15%	0%	0%	100%
80010 Support Customers & Stakeholders (SCS)									
539	Representing the ISO	0%	20%	3%	2%	0%	62%	13%	100%
601	Manage Client Inquiries	0%	0%	0%	4%	0%	0%	96%	100%
602	Account Management	0%	0%	0%	0%	0%	0%	100%	100%
603	Manage Stakeholder Processes	0%	2%	0%	0%	0%	0%	98%	100%
609	Manage External Affairs	0%	0%	0%	0%	1%	21%	78%	100%
610	Manage Communications & Public Relations	0%	0%	0%	0%	0%	0%	100%	100%
6	Total SCS	0%	1%	0%	1%	0%	10%	88%	100%
Total Direct O&M		6%	10%	33%	35%	5%	4%	6%	100%

DIRECT OPERATING ACTIVITIES

The direct operating activities costs were factored into the allocation matrix shown in *Table 6 — Mapping of ABC Direct Operating Activities to Cost Categories* to get the costs to the cost categories.

Table 17 — Allocation of Division Costs to Direct Operating Activities

Allocation of Costs By Division (\$ in thousands)									
ABC Process Code	Level 1 ABC Activity	Corporate Services	Market and Infrastructure Development	Technology	Operations	General Counsel	Market Quality and California Regulatory Affairs	External and Customer Affairs	Total
Direct									
80001	Develop Infrastructure	\$ 629	\$ 11,623	\$ -	\$ 416	\$ 24	\$ 125	\$ 46	\$ 12,863
80002	Develop Markets	\$ 170	\$ 4,190	\$ -	\$ 599	\$ 1,302	\$ 3,442	\$ -	\$ 9,703
80004	Manage Market & Reliability Data & Modeling	\$ 1,303	\$ 227	\$ 3,247	\$ 9,678	\$ -	\$ 1,098	\$ 923	\$ 16,476
80005	Manage Market & Grid	\$ 610	\$ -	\$ 799	\$ 28,077	\$ -	\$ 206	\$ -	\$ 29,692
80007	Manage Operations Support & Settlements	\$ 359	\$ -	\$ 406	\$ 6,132	\$ 19	\$ 2,127	\$ 181	\$ 9,224
80008	Plan & Manage Business	\$ 1,282	\$ 51	\$ 14,432	\$ 13	\$ 2,039	\$ 19	\$ 90	\$ 17,926
80009	Support Business Services	\$ 6,814	\$ 251	\$ 26,511	\$ 2,457	\$ 8,473	\$ 4	\$ 18	\$ 44,528
80010	Support Customers & Stakeholders	\$ 178	\$ 163	\$ 24	\$ 64	\$ 41	\$ 1,575	\$ 9,154	\$ 11,199
	Total	\$ 11,345	\$ 16,505	\$ 45,419	\$ 47,436	\$ 11,898	\$ 8,596	\$ 10,412	\$ 151,611

The costs were then aggregated by level 2 activity.

Table 18 — Allocation of Division Costs to Level 2 Activity

2019 Modified Revenue Requirement: ABC Direct Operating Activities		Allocation of Costs By Division									
Code	ABC Level 2 Activities	Market and Corporate Services		Infrastructure Development		Technology Operations		Market Quality and California Regulatory Affairs		External and Customer Affairs	Total
		Services	Development	Technology	Operations	General Counsel	Regulatory Affairs	Customer Affairs			
<i>budget allocations (amounts in thousands)</i>											
80001 Develop Infrastructure (DI)											
201	Develop and Monitor Regulatory Contract Procedures	\$ 18	\$ 580	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 46	\$ 644	
202	Manage Generator Interconnection Agreements	\$ 9	\$ 310	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 319	
203	Manage Generator Interconnection Process	\$ 449	\$ 2,289	\$ -	\$ 3	\$ 24	\$ -	\$ -	\$ -	\$ 2,765	
204	Manage Long Term Transmission Planning	\$ 110	\$ 6,504	\$ -	\$ 4	\$ -	\$ -	\$ -	\$ -	\$ 6,618	
205	Manage New Transmission Resources	\$ 10	\$ 179	\$ -	\$ 409	\$ -	\$ 87	\$ -	\$ -	\$ 685	
206	Manage Transmission Maintenance Standards	\$ 10	\$ 504	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 514	
207	Manage Load Resource Data	\$ 6	\$ 241	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 247	
208	Seasonal Assessment	\$ 7	\$ 239	\$ -	\$ -	\$ -	\$ 38	\$ -	\$ -	\$ 284	
209	Manage Queue Management	\$ 10	\$ 776	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 786	
210	Manage Annual Delivery Assessment	\$ -	\$ 1	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1	
	Total DI	\$ 629	\$ 11,623	\$ -	\$ 416	\$ 24	\$ 125	\$ 46	\$ 12,863		
80002 Develop Markets (DM)											
226	Manage Regulatory Filings	\$ 10	\$ -	\$ -	\$ -	\$ 833	\$ -	\$ -	\$ -	\$ 843	
227	Manage Tariff Amendments	\$ 5	\$ 2	\$ -	\$ -	\$ 458	\$ -	\$ -	\$ -	\$ 465	
228	Manage Post Order, Rehearing, and Compliance	\$ -	\$ -	\$ -	\$ -	\$ 11	\$ -	\$ -	\$ -	\$ 11	
229	Develop State / Federal Regulatory Policy	\$ 5	\$ 30	\$ -	\$ 282	\$ -	\$ -	\$ -	\$ -	\$ 317	
230	BPM Change Management	\$ 5	\$ 47	\$ -	\$ 138	\$ -	\$ -	\$ -	\$ -	\$ 190	
231	Develop Infrastructure Policy	\$ 45	\$ 2,031	\$ -	\$ 177	\$ -	\$ 55	\$ -	\$ -	\$ 2,308	
232	Perform Market Analysis	\$ 55	\$ 120	\$ -	\$ 2	\$ -	\$ 3,121	\$ -	\$ -	\$ 3,298	
233	Develop Market Design	\$ 35	\$ 1,603	\$ -	\$ -	\$ -	\$ 266	\$ -	\$ -	\$ 1,904	
234	Manage Regulatory Contract Negotiations	\$ 10	\$ 357	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 367	
	Total DM	\$ 170	\$ 4,190	\$ -	\$ 599	\$ 1,302	\$ 3,442	\$ -	\$ 9,703		

2019 Modified Revenue Requirement: ABC Direct Operating Activities		Allocation of Costs By Division							
Code	ABC Level 2 Activities	Corporate Services	Market and Infrastructure Development	Technology	Operations	General Counsel	Market Quality and California Regulatory Affairs	External and Customer Affairs	Total
<i>budget allocations (amounts in thousands)</i>									
80004	Manage Market & Reliability Data & Modeling (MMR)								
301	Manage Full Network Model Maintenance	\$ 109	\$ -	\$ 3,245	\$ 501	\$ -	\$ -	\$ -	\$ 3,855
302	Plan & Develop Operations Simulator Training	\$ 9	\$ -	\$ 2	\$ 401	\$ -	\$ -	\$ -	\$ 412
304	EMAA Telemetry	\$ 17	\$ -	\$ -	\$ 520	\$ -	\$ -	\$ -	\$ 537
307	Manage Congestion Revenue Rights	\$ 19	\$ -	\$ -	\$ 108	\$ -	\$ -	\$ -	\$ 127
308	Manage Credit & Collateral	\$ 782	\$ -	\$ -	\$ -	\$ -	\$ 1	\$ -	\$ 783
309	Resource Management	\$ 28	\$ -	\$ -	\$ 1,309	\$ -	\$ -	\$ -	\$ 1,337
310	Manage Reliability Requirements	\$ 24	\$ 208	\$ -	\$ 1,095	\$ -	\$ 174	\$ 2	\$ 1,503
311	Manage Operations Planning	\$ 54	\$ -	\$ -	\$ 1,829	\$ -	\$ -	\$ -	\$ 1,883
312	Manage WECC Studies	\$ 2	\$ -	\$ -	\$ 78	\$ -	\$ -	\$ -	\$ 80
314	Manage & Facilitate Procedure Maintenance	\$ 13	\$ -	\$ -	\$ 290	\$ -	\$ -	\$ -	\$ 303
316	Plan & Develop Operations Training	\$ 48	\$ -	\$ -	\$ 2,050	\$ -	\$ 61	\$ -	\$ 2,159
317	Execute & Track Operations Training	\$ 29	\$ -	\$ -	\$ 1,327	\$ -	\$ -	\$ -	\$ 1,356
320	Provide Stakeholder Training	\$ 21	\$ -	\$ -	\$ 1	\$ -	\$ -	\$ 751	\$ 773
321	Schedule Coordinator Management	\$ 6	\$ 19	\$ -	\$ -	\$ -	\$ -	\$ 170	\$ 195
322	Register, Modify and Terminate PDR Resource	\$ 5	\$ -	\$ -	\$ 169	\$ -	\$ -	\$ -	\$ 174
323	Calculate & Monitor Energy Costs & Indices	\$ 137	\$ -	\$ -	\$ -	\$ -	\$ 862	\$ -	\$ 999
	Total MMR	\$ 1,303	\$ 227	\$ 3,247	\$ 9,678	\$ -	\$ 1,098	\$ 923	\$ 16,476
80005	Manage Market & Grid (MMG)								
352	Manage Day Ahead Market Support	\$ 7	\$ -	\$ 10	\$ 177	\$ -	\$ 186	\$ -	\$ 380
353	Operations Real Time Support	\$ 28	\$ -	\$ 785	\$ 248	\$ -	\$ 20	\$ -	\$ 1,081
355	Outage Model & Management	\$ 62	\$ -	\$ -	\$ 2,496	\$ -	\$ -	\$ -	\$ 2,558
360	Real Time Operations	\$ 258	\$ -	\$ -	\$ 12,797	\$ -	\$ -	\$ -	\$ 13,055
362	Manage Operations Engineering Support	\$ 101	\$ -	\$ -	\$ 3,915	\$ -	\$ -	\$ -	\$ 4,016
367	Manage Operations Compliance & Event Analysis	\$ 18	\$ -	\$ -	\$ 75	\$ -	\$ -	\$ -	\$ 93
368	Manage Day Ahead and Market Operations	\$ 51	\$ -	\$ 1	\$ 2,422	\$ -	\$ -	\$ -	\$ 2,474
370	Manage Real Time Reliability Coordination	\$ 85	\$ -	\$ 3	\$ 5,947	\$ -	\$ -	\$ -	\$ 6,035
	Total MMG	\$ 610	\$ -	\$ 799	\$ 28,077	\$ -	\$ 206	\$ -	\$ 29,692

2019 Modified Revenue Requirement: ABC Direct Operating Activities		Allocation of Costs By Division							
Code	ABC Level 2 Activities	Corporate Services	Market and Infrastructure Development	Technology	Operations	General Counsel	Market Quality and California Regulatory Affairs	External and Customer Affairs	Total
<i>budget allocations (amounts in thousands)</i>									
80007 Manage Operations Support & Settlements (MOS)									
401	Perform Market Validation	\$ 1	\$ -	\$ -	\$ 23	\$ -	\$ -	\$ -	\$ 24
402	Manage Dispute Analysis & Resolution	\$ 29	\$ -	\$ 60	\$ 1,386	\$ -	\$ -	\$ -	\$ 1,475
403	Manage Market Quality System	\$ 18	\$ -	\$ 346	\$ 209	\$ -	\$ -	\$ -	\$ 573
406	Manage Rules of Conduct	\$ 2	\$ -	\$ -	\$ 70	\$ -	\$ -	\$ -	\$ 72
409	Meter Data Acquisition and Processing	\$ 15	\$ -	\$ -	\$ 459	\$ -	\$ -	\$ -	\$ 474
411	Manage Market Clearing	\$ 118	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 118
412	Manage Market Billing & Settlements	\$ 55	\$ -	\$ -	\$ 1,124	\$ -	\$ -	\$ 154	\$ 1,333
413	Manage Reliability Must Run Settlements	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 7	\$ 7
414	Manage Settlements Quarterly Release Cycle	\$ 71	\$ -	\$ -	\$ 2,253	\$ -	\$ -	\$ -	\$ 2,324
417	Perform Market Report	\$ 6	\$ -	\$ -	\$ 198	\$ -	\$ 745	\$ -	\$ 949
418	Manage Good Faith Negotiation Requests	\$ 1	\$ -	\$ -	\$ -	\$ 19	\$ -	\$ 20	\$ 40
419	Manage Price Corrections	\$ 43	\$ -	\$ -	\$ 410	\$ -	\$ 1,382	\$ -	\$ 1,835
	Total MOS	\$ 359	\$ -	\$ 406	\$ 6,132	\$ 19	\$ 2,127	\$ 181	\$ 9,224
80008 Plan & Manage Business (PMB)									
451	Manage Financial Planning	\$ 981	\$ -	\$ 3	\$ -	\$ -	\$ 19	\$ -	\$ 1,003
452	Manage Application, Environment & Infrastructure	\$ 48	\$ -	\$ 3,066	\$ -	\$ -	\$ -	\$ -	\$ 3,114
453	Manage Resource Allocation	\$ 3	\$ -	\$ 99	\$ -	\$ -	\$ -	\$ -	\$ 102
454	Project Portfolio Management	\$ 28	\$ -	\$ 1,832	\$ 13	\$ -	\$ -	\$ -	\$ 1,873
455	Manage Technology Collaboration (Internal)	\$ 60	\$ -	\$ 2,510	\$ -	\$ -	\$ -	\$ -	\$ 2,570
457	Manage Annual Functional Release Lifecycle	\$ 5	\$ -	\$ 184	\$ -	\$ -	\$ -	\$ -	\$ 189
459	Enterprise Risk Management	\$ 1	\$ -	\$ -	\$ -	\$ 60	\$ -	\$ -	\$ 61
461	Perform Board Processes	\$ 70	\$ 51	\$ -	\$ -	\$ 1,853	\$ -	\$ 90	\$ 2,064
462	Manage Technology Collaboration (External)	\$ 2	\$ -	\$ 145	\$ -	\$ -	\$ -	\$ -	\$ 147
466	Manage Corporate Goal Alignment and Reporting	\$ 3	\$ -	\$ 49	\$ -	\$ 126	\$ -	\$ -	\$ 178
467	Research & Proof of Concept	\$ 2	\$ -	\$ 205	\$ -	\$ -	\$ -	\$ -	\$ 207
469	Manage Project & Effort Lifecycles	\$ 79	\$ -	\$ 6,339	\$ -	\$ -	\$ -	\$ -	\$ 6,418
	Total PMB	\$ 1,282	\$ 51	\$ 14,432	\$ 13	\$ 2,039	\$ 19	\$ 90	\$ 17,926

2019 Modified Revenue Requirement: ABC Direct Operating Activities		Allocation of Costs By Division							
Code	ABC Level 2 Activities	Corporate Services	Market and Infrastructure Development	Technology	Operations	General Counsel	Market Quality and California Regulatory Affairs	External and Customer Affairs	Total
<i>budget allocations (amounts in thousands)</i>									
80009 Support Business Services (SBS)									
501	Manage Monthly Financial Cycle	\$ 778	\$ -	\$ 1	\$ -	\$ -	\$ -	\$ -	\$ 779
502	Invest Corporate Funds	\$ 500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 500
503	Manage Financial Reporting	\$ 272	\$ -	\$ -	\$ -	\$ 5	\$ -	\$ -	\$ 277
504	IT Application, System, & Non-Production Support	\$ 343	\$ -	\$ 13,657	\$ -	\$ -	\$ -	\$ -	\$ 14,000
505	IT Asset Management	\$ 17	\$ -	\$ 650	\$ -	\$ -	\$ -	\$ -	\$ 667
508	IT Configuration, Change & Release Management	\$ 33	\$ -	\$ 1,441	\$ 13	\$ -	\$ -	\$ 4	\$ 1,491
510	IT Event Management	\$ 4	\$ -	\$ 174	\$ -	\$ -	\$ -	\$ -	\$ 178
511	IT Incident Management	\$ 96	\$ -	\$ 4,381	\$ -	\$ -	\$ 1	\$ -	\$ 4,478
512	IT Information Security Management	\$ 36	\$ -	\$ 1,545	\$ 266	\$ 18	\$ -	\$ 1	\$ 1,866
513	IT Problem & Risk Lifecycle Management	\$ 18	\$ 5	\$ 814	\$ -	\$ -	\$ -	\$ -	\$ 837
519	Provision and Manage Access	\$ 12	\$ -	\$ 549	\$ -	\$ -	\$ -	\$ -	\$ 561
520	Manage Facilities, Physical Security, & Safety	\$ 64	\$ 1	\$ 1,672	\$ 2	\$ -	\$ -	\$ -	\$ 1,739
521	Facilities Incident Management	\$ -	\$ -	\$ 4	\$ -	\$ -	\$ -	\$ -	\$ 4
522	Corporate Incident Response & Disaster Recovery	\$ 3	\$ -	\$ -	\$ 7	\$ 7	\$ -	\$ 2	\$ 19
523	Manage Business Continuity Plan	\$ 44	\$ 5	\$ 1,101	\$ 1,566	\$ 372	\$ 3	\$ 10	\$ 3,101
528	Procurement & Vendor Management	\$ 791	\$ -	\$ 13	\$ -	\$ -	\$ -	\$ -	\$ 804
529	Provide Legal Advice	\$ 57	\$ -	\$ -	\$ -	\$ 3,879	\$ -	\$ -	\$ 3,936
530	Manage Dispute Resolution	\$ 2	\$ -	\$ 8	\$ -	\$ 53	\$ -	\$ -	\$ 63
533	Manage Evidence Review / Audit	\$ 3	\$ -	\$ 75	\$ 52	\$ -	\$ -	\$ -	\$ 130
535	Tariff Controls Monitoring	\$ 7	\$ -	\$ 19	\$ -	\$ 395	\$ -	\$ -	\$ 421
536	Manage Internal Audit	\$ 37	\$ -	\$ 12	\$ -	\$ 1,849	\$ -	\$ -	\$ 1,898
537	Monitor Markets	\$ 1,914	\$ -	\$ 3	\$ 70	\$ -	\$ -	\$ -	\$ 1,987
538	Manage Tariff Rules Violations	\$ 34	\$ -	\$ -	\$ -	\$ 15	\$ -	\$ -	\$ 49
543	Market Design	\$ 358	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 358
544	Maintain DMM Database	\$ 1,329	\$ -	\$ 1	\$ -	\$ -	\$ -	\$ -	\$ 1,330
545	Manage Business Process & Continuous Improvement	\$ 5	\$ -	\$ 191	\$ 46	\$ -	\$ -	\$ -	\$ 242
546	Records Management	\$ 12	\$ 16	\$ 3	\$ 8	\$ 178	\$ -	\$ 1	\$ 218
548	Manage Compliance Standards Development and Implementation	\$ 2	\$ 17	\$ 25	\$ 37	\$ 15	\$ -	\$ -	\$ 96
549	Manage Compliance Investigations	\$ 3	\$ -	\$ 18	\$ -	\$ 155	\$ -	\$ -	\$ 176
550	Manage NERC Compliance	\$ 33	\$ 207	\$ 111	\$ -	\$ 1,500	\$ -	\$ -	\$ 1,851
552	IT Reports & Documentation	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
553	Manage Vulnerability Remediation	\$ -	\$ -	\$ 2	\$ -	\$ -	\$ -	\$ -	\$ 2
554	Monitor & Maintain Backups	\$ 1	\$ -	\$ 41	\$ -	\$ -	\$ -	\$ -	\$ 42
555	Manage Root Cause Analysis	\$ 6	\$ -	\$ -	\$ 390	\$ 32	\$ -	\$ -	\$ 428
	Total SBS	\$ 6,814	\$ 251	\$ 26,511	\$ 2,457	\$ 8,473	\$ 4	\$ 18	\$ 44,528
80010 Support Customers & Stakeholders (SCS)									
539	Representing the ISO	\$ 8	\$ 145	\$ 17	\$ 7	\$ -	\$ 907	\$ 69	\$ 1,153
601	Manage Client Inquiries	\$ 38	\$ 4	\$ 7	\$ 57	\$ -	\$ 2	\$ 1,538	\$ 1,646
602	Account Management	\$ 19	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 699	\$ 718
603	Manage Stakeholder Processes	\$ 20	\$ 10	\$ -	\$ -	\$ -	\$ -	\$ 927	\$ 957
609	Manage External Affairs	\$ 57	\$ 4	\$ -	\$ -	\$ 41	\$ 666	\$ 4,161	\$ 4,929
610	Manage Communications & Public Relations	\$ 36	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,760	\$ 1,796
	Total SCS	\$ 178	\$ 163	\$ 24	\$ 64	\$ 41	\$ 1,575	\$ 9,154	\$ 11,199
	Total Direct O&M	\$ 11,345	\$ 16,505	\$ 45,419	\$ 47,436	\$ 11,898	\$ 8,596	\$ 10,412	\$ 151,611

For direct operating activities the costs were aggregated at level 2 and allocated to the cost category identified in *Table 6 — Mapping of ABC Direct Operating Activities to Cost Categories*.

Table 19 — Allocation of ABC Direct Operating Activity Costs to Cost Categories

2019 Modified Revenue Requirement: ABC Direct Operating Activities												
		GMC					GMC					
Code	ABC Level 2 Activities	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect	2019 Budget	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect
cost category % allocation						budget allocations (amounts in thousands)						
80001 Develop Infrastructure (DI)												
201	Develop and Monitor Regulatory Contract Procedures	95%			5%		\$ 644	\$ 612	\$ -	\$ -	\$ 32	\$ -
202	Manage Generator Interconnection Agreements		100%				\$ 319	\$ -	\$ 319	\$ -	\$ -	\$ -
203	Manage Generator Interconnection Process		100%				\$ 2,765	\$ -	\$ 2,765	\$ -	\$ -	\$ -
204	Manage Long Term Transmission Planning		100%				\$ 6,618	\$ -	\$ 6,618	\$ -	\$ -	\$ -
205	Manage New Transmission Resources		95%		5%		\$ 685	\$ -	\$ 651	\$ -	\$ 34	\$ -
206	Manage Transmission Maintenance Standards		100%				\$ 514	\$ -	\$ 514	\$ -	\$ -	\$ -
207	Manage Load Resource Data		100%				\$ 247	\$ -	\$ 247	\$ -	\$ -	\$ -
208	Seasonal Assessment		100%				\$ 284	\$ -	\$ 284	\$ -	\$ -	\$ -
209	Manage Queue Management		100%				\$ 786	\$ -	\$ 786	\$ -	\$ -	\$ -
210	Manage Annual Delivery Assessment		100%				\$ 1	\$ -	\$ 1	\$ -	\$ -	\$ -
	Total DI						\$ 12,863	\$ 612	\$ 12,185	\$ -	\$ 66	\$ -
80002 Develop Markets (DM)												
226	Manage Regulatory Filings				100%		\$ 843	\$ -	\$ -	\$ -	\$ -	\$ 843
227	Manage Tariff Amendments				100%		\$ 465	\$ -	\$ -	\$ -	\$ -	\$ 465
228	Manage Post Order, Rehearing, and Compliance				100%		\$ 11	\$ -	\$ -	\$ -	\$ -	\$ 11
229	Develop State / Federal Regulatory Policy	40%	60%				\$ 317	\$ 127	\$ 190	\$ -	\$ -	\$ -
230	BPM Change Management	80%	10%	5%	5%		\$ 190	\$ 151	\$ 19	\$ 10	\$ 10	\$ -
231	Develop Infrastructure Policy	40%	60%				\$ 2,308	\$ 923	\$ 1,385	\$ -	\$ -	\$ -
232	Perform Market Analysis	80%	15%	5%			\$ 3,298	\$ 2,638	\$ 495	\$ 165	\$ -	\$ -
233	Develop Market Design	100%					\$ 1,904	\$ 1,904	\$ -	\$ -	\$ -	\$ -
234	Manage Regulatory Contract Negotiations	95%			5%		\$ 367	\$ 349	\$ -	\$ -	\$ 18	\$ -
	Total DM						\$ 9,703	\$ 6,092	\$ 2,089	\$ 175	\$ 28	\$ 1,319

2019 Modified Revenue Requirement: ABC Direct Operating Activities

		GMC					GMC										
Code	ABC Level 2 Activities	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect	2019 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%		\$ 3,855	\$ 1,735	\$ 1,734	\$ 193	\$ 193	\$ -					
302	Plan & Develop Operations Simulator Training		95%		5%		\$ 412	\$ -	\$ 391	\$ -	\$ 21	\$ -					
304	EMAA Telemetry	50%	50%				\$ 537	\$ 268	\$ 269	\$ -	\$ -	\$ -					
307	Manage Congestion Revenue Rights			100%			\$ 127	\$ -	\$ -	\$ 127	\$ -	\$ -					
308	Manage Credit & Collateral	40%	40%	20%			\$ 783	\$ 313	\$ 313	\$ 157	\$ -	\$ -					
309	Resource Management	50%	50%				\$ 1,337	\$ 669	\$ 668	\$ -	\$ -	\$ -					
310	Manage Reliability Requirements		100%				\$ 1,503	\$ -	\$ 1,503	\$ -	\$ -	\$ -					
311	Manage Operations Planning		95%		5%		\$ 1,883	\$ -	\$ 1,789	\$ -	\$ 94	\$ -					
312	Manage WECC Studies		100%				\$ 80	\$ -	\$ 80	\$ -	\$ -	\$ -					
314	Manage & Facilitate Procedure Maintenance		95%		5%		\$ 303	\$ -	\$ 288	\$ -	\$ 15	\$ -					
316	Plan & Develop Operations Training		95%		5%		\$ 2,159	\$ -	\$ 2,051	\$ -	\$ 108	\$ -					
317	Execute & Track Operations Training		95%		5%		\$ 1,356	\$ -	\$ 1,288	\$ -	\$ 68	\$ -					
320	Provide Stakeholder Training	60%	30%	5%	5%		\$ 773	\$ 463	\$ 232	\$ 39	\$ 39	\$ -					
321	Schedule Coordinator Management	45%	45%	5%	5%		\$ 195	\$ 87	\$ 88	\$ 10	\$ 10	\$ -					
322	Register, Modify and Terminate PDR Resource	100%					\$ 174	\$ 174	\$ -	\$ -	\$ -	\$ -					
323	Calculate & Monitor Energy Costs & Indices	60%	35%		5%		\$ 999	\$ 599	\$ 350	\$ -	\$ 50	\$ -					
	Total MMR						\$ 16,476	\$ 4,308	\$ 11,044	\$ 526	\$ 598	\$ -					
80005 Manage Market & Grid (MMG)																	
352	Manage Day Ahead Market Support	95%			5%		\$ 380	\$ 361	\$ -	\$ -	\$ 19	\$ -					
353	Operations Real Time Support	80%	15%		5%		\$ 1,081	\$ 865	\$ 162	\$ -	\$ 54	\$ -					
355	Outage Model & Management	5%	60%		35%		\$ 2,558	\$ 128	\$ 1,535	\$ -	\$ 895	\$ -					
360	Real Time Operations	20%	80%				\$ 13,055	\$ 2,611	\$ 10,444	\$ -	\$ -	\$ -					
362	Manage Operations Engineering Support	15%	80%		5%		\$ 4,016	\$ 602	\$ 3,213	\$ -	\$ 201	\$ -					
367	Manage Operations Compliance & Event Analysis		50%		50%		\$ 93	\$ -	\$ 46	\$ -	\$ 47	\$ -					
368	Manage Day Ahead and Market Operations	100%					\$ 2,474	\$ 2,474	\$ -	\$ -	\$ -	\$ -					
370	Manage Real Time Reliability Coordination				100%		\$ 6,035	\$ -	\$ -	\$ -	\$ 6,035	\$ -					
	Total MMG						\$ 29,692	\$ 7,041	\$ 15,400	\$ -	\$ 7,251	\$ -					
	MMG %s						100%	24%	52%	0%	24%	0%					

2019 Modified Revenue Requirement: ABC Direct Operating Activities																	
		GMC					GMC										
Code	ABC Level 2 Activities	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect	2019 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%				\$ 24	\$ 19	\$ 5	\$ -	\$ -	\$ -					
402	Manage Dispute Analysis & Resolution	100%					\$ 1,475	\$ 1,475	\$ -	\$ -	\$ -	\$ -					
403	Manage Market Quality System	50%	40%	10%			\$ 573	\$ 287	\$ 229	\$ 57	\$ -	\$ -					
406	Manage Rules of Conduct					100%	\$ 72	\$ -	\$ -	\$ -	\$ -	\$ 72					
409	Meter Data Acquisition and Processing	100%					\$ 474	\$ 474	\$ -	\$ -	\$ -	\$ -					
411	Manage Market Clearing	45%	45%	5%	5%		\$ 118	\$ 53	\$ 53	\$ 6	\$ 6	\$ -					
412	Manage Market Billing & Settlements	45%	45%	5%	5%		\$ 1,333	\$ 600	\$ 599	\$ 67	\$ 67	\$ -					
413	Manage Reliability Must Run Settlements		100%				\$ 7	\$ -	\$ 7	\$ -	\$ -	\$ -					
414	Manage Settlements Quarterly Release Cycle	45%	45%	5%	5%		\$ 2,324	\$ 1,046	\$ 1,046	\$ 116	\$ 116	\$ -					
417	Perform Market Report	80%	20%				\$ 949	\$ 759	\$ 190	\$ -	\$ -	\$ -					
418	Manage Good Faith Negotiation Requests	100%					\$ 40	\$ 40	\$ -	\$ -	\$ -	\$ -					
419	Manage Price Corrections	50%	40%	10%			\$ 1,835	\$ 917	\$ 734	\$ 184	\$ -	\$ -					
	Total MOS						\$ 9,224	\$ 5,670	\$ 2,863	\$ 430	\$ 189	\$ 72					
80008 Plan & Manage Business (PMB)																	
451	Manage Financial Planning					100%	\$ 1,003	\$ -	\$ -	\$ -	\$ -	\$ 1,003					
452	Manage Application, Environment & Infrastructure					100%	\$ 3,114	\$ -	\$ -	\$ -	\$ -	\$ 3,114					
453	Manage Resource Allocation					100%	\$ 102	\$ -	\$ -	\$ -	\$ -	\$ 102					
454	Project Portfolio Management					100%	\$ 1,873	\$ -	\$ -	\$ -	\$ -	\$ 1,873					
455	Manage Technology Collaboration (Internal)	100%					\$ 2,570	\$ 2,570	\$ -	\$ -	\$ -	\$ -					
457	Manage Annual Functional Release Lifecycle					100%	\$ 189	\$ -	\$ -	\$ -	\$ -	\$ 189					
459	Enterprise Risk Management					100%	\$ 61	\$ -	\$ -	\$ -	\$ -	\$ 61					
461	Perform Board Processes					100%	\$ 2,064	\$ -	\$ -	\$ -	\$ -	\$ 2,064					
462	Manage Technology Collaboration (External)	100%					\$ 147	\$ 147	\$ -	\$ -	\$ -	\$ -					
466	Manage Corporate Goal Alignment and Reporting					100%	\$ 178	\$ -	\$ -	\$ -	\$ -	\$ 178					
467	Research & Proof of Concept					100%	\$ 207	\$ -	\$ -	\$ -	\$ -	\$ 207					
469	Manage Project & Effort Lifecycles					100%	\$ 6,418	\$ -	\$ -	\$ -	\$ -	\$ 6,418					
	Total PMB						\$ 17,926	\$ 2,717	\$ -	\$ -	\$ -	\$ 15,209					

2019 Modified Revenue Requirement: ABC Direct Operating Activities												
		GMC					GMC					
Code	ABC Level 2 Activities	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect	2019 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%	\$ 779	\$ -	\$ -	\$ -	\$ -	\$ 779
502	Invest Corporate Funds					100%	\$ 500	\$ -	\$ -	\$ -	\$ -	\$ 500
503	Manage Financial Reporting					100%	\$ 277	\$ -	\$ -	\$ -	\$ -	\$ 277
504	IT Application, System, & Non-Production Support	80%	15%		5%		\$ 14,000	\$ 11,200	\$ 2,100	\$ -	\$ 700	\$ -
505	IT Asset Management					100%	\$ 667	\$ -	\$ -	\$ -	\$ -	\$ 667
508	IT Configuration, Change & Release Management					100%	\$ 1,491	\$ -	\$ -	\$ -	\$ -	\$ 1,491
510	IT Event Management					100%	\$ 178	\$ -	\$ -	\$ -	\$ -	\$ 178
511	IT Incident Management	60%	30%	5%	5%		\$ 4,478	\$ 2,687	\$ 1,343	\$ 224	\$ 224	\$ -
512	IT Information Security Management					100%	\$ 1,866	\$ -	\$ -	\$ -	\$ -	\$ 1,866
513	IT Problem & Risk Lifecycle Management	60%	30%	5%	5%		\$ 837	\$ 502	\$ 251	\$ 42	\$ 42	\$ -
519	Provision and Manage Access					100%	\$ 561	\$ -	\$ -	\$ -	\$ -	\$ 561
520	Manage Facilities, Physical Security, & Safety					100%	\$ 1,739	\$ -	\$ -	\$ -	\$ -	\$ 1,739
521	Facilities Incident Management					100%	\$ 4	\$ -	\$ -	\$ -	\$ -	\$ 4
522	Corporate Incident Response & Disaster Recovery					100%	\$ 19	\$ -	\$ -	\$ -	\$ -	\$ 19
523	Manage Business Continuity Plan					100%	\$ 3,101	\$ -	\$ -	\$ -	\$ -	\$ 3,101
528	Procurement & Vendor Management					100%	\$ 804	\$ -	\$ -	\$ -	\$ -	\$ 804
529	Provide Legal Advice					100%	\$ 3,936	\$ -	\$ -	\$ -	\$ -	\$ 3,936
530	Manage Dispute Resolution					100%	\$ 63	\$ -	\$ -	\$ -	\$ -	\$ 63
533	Manage Evidence Review / Audit					100%	\$ 130	\$ -	\$ -	\$ -	\$ -	\$ 130
535	Tariff Controls Monitoring					100%	\$ 421	\$ -	\$ -	\$ -	\$ -	\$ 421
536	Manage Internal Audit					100%	\$ 1,898	\$ -	\$ -	\$ -	\$ -	\$ 1,898
537	Monitor Markets	80%		20%			\$ 1,987	\$ 1,590	\$ -	\$ 397	\$ -	\$ -
538	Manage Tariff Rules Violations					100%	\$ 49	\$ -	\$ -	\$ -	\$ -	\$ 49
543	Market Design					100%	\$ 358	\$ -	\$ -	\$ -	\$ -	\$ 358
544	Maintain DMM Database					100%	\$ 1,330	\$ -	\$ -	\$ -	\$ -	\$ 1,330
545	Manage Business Process & Continuous Improvement					100%	\$ 242	\$ -	\$ -	\$ -	\$ -	\$ 242
546	Records Management					100%	\$ 218	\$ -	\$ -	\$ -	\$ -	\$ 218
548	Manage Compliance Standards Development and Implementation					100%	\$ 96	\$ -	\$ -	\$ -	\$ -	\$ 96
549	Manage Compliance Investigations					100%	\$ 176	\$ -	\$ -	\$ -	\$ -	\$ 176
550	Manage NERC Compliance					100%	\$ 1,851	\$ -	\$ -	\$ -	\$ -	\$ 1,851
552	IT Reports & Documentation					100%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
553	Manage Vulnerability Remediation					100%	\$ 2	\$ -	\$ -	\$ -	\$ -	\$ 2
554	Monitor & Maintain Backups					100%	\$ 42	\$ -	\$ -	\$ -	\$ -	\$ 42
555	Manage Root Cause Analysis					100%	\$ 428	\$ -	\$ -	\$ -	\$ -	\$ 428
Total SBS							\$ 44,528	\$ 15,979	\$ 3,694	\$ 663	\$ 966	\$ 23,226
80010 Support Customers & Stakeholders (SCS)												
539	Representing the ISO					100%	\$ 1,153	\$ -	\$ -	\$ -	\$ -	\$ 1,153
601	Manage Client Inquiries	80%	10%	5%	5%		\$ 1,646	\$ 1,317	\$ 165	\$ 82	\$ 82	\$ -
602	Account Management	80%	10%	5%	5%		\$ 718	\$ 574	\$ 72	\$ 36	\$ 36	\$ -
603	Manage Stakeholder Processes	80%	10%	5%	5%		\$ 957	\$ 765	\$ 96	\$ 48	\$ 48	\$ -
609	Manage External Affairs					100%	\$ 4,929	\$ -	\$ -	\$ -	\$ -	\$ 4,929
610	Manage Communications & Public Relations					100%	\$ 1,796	\$ -	\$ -	\$ -	\$ -	\$ 1,796
Total SCS							\$ 11,199	\$ 2,656	\$ 333	\$ 166	\$ 166	\$ 7,878
Total Direct O&M							\$ 151,611	\$ 45,075	\$ 47,608	\$ 1,960	\$ 9,264	\$ 47,704
Direct O&M %							100%	30%	31%	1%	6%	32%

ABC INDIRECT ACTIVITIES

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

Table 20 — Allocation of Division Hours to Indirect Operating Activities

		Allocation of Hours By Division							
ABC Process Code	Level 1 ABC Activity	Corporate Services	Market and Infrastructure Development	Technology	Operations	General Counsel	Market Quality and California Regulatory Affairs	External and Customer Affairs	Total
Indirect									
80003	Manage Human Capabilities	97%	0%	1%	1%	0%	0%	0%	100%

These costs were inputs into the allocation matrix shown in *Table 8 — Mapping of ABC Indirect Activities to Cost Categories* to get the costs to the cost categories.

Table 21 — Allocation of Division Costs to Indirect Operating Activities

		Allocation of Costs By Division (\$ in thousands)							
ABC Process Code	Level 1 ABC Activity	Corporate Services	Market and Infrastructure Development	Technology	Operations	General Counsel	Market Quality and California Regulatory Affairs	External and Customer Affairs	Total
Indirect									
80003	Manage Human Capabilities	\$ 3,286	\$ 9	\$ 45	\$ 21	\$ 45	\$ 13	\$ 1	\$ 3,420

For indirect activities, the costs were aggregated and allocated as shown in *Table 8 — Mapping of ABC Indirect Activities to Cost Categories*.

Table 22 — Allocation of ABC Indirect Activity Costs to Cost Categories

2019 Modified Revenue Requirement: ABC Indirect Costs											
Component	GMC					2019 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>				
ABC Indirect Costs											
80003: Manage Human Capabilities (MHC)					100%	\$ 3,420	\$ -	\$ -	\$ -	\$ -	\$ 3,420
Total ABC Indirect Costs						\$ 3,420	\$ -	\$ -	\$ -	\$ -	\$ 3,420

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 9 — Mapping of Debt Service and Capital to Cost Categories*.

Table 23 — Allocation of Debt Service and Cash Funded Capital to Cost Categories

2019 Modified Revenue Requirement: Debt Service Bonds and Cash Funded Capital											
Component	GMC					2019 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%	\$ 16,904	\$ -	\$ -	\$ -	\$ -	\$ 16,904
Cash Funded Capital					100%	\$ 25,000	\$ -	\$ -	\$ -	\$ -	\$ 25,000

OTHER REVENUE

The components of other revenue were reviewed and all revenues allocated pursuant to *Table 10 — Mapping of Other Revenue to Cost Categories*.

Table 24 — Allocation of Other Revenue to Cost Categories

2019 Modified Revenue Requirement: Other Costs and Revenues											
Component	GMC					2019 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											
California-Oregon Intertie Path Operator Fees				100%		\$ 2,000	\$ -	\$ 2,000	\$ -	\$ -	\$ -
Energy Imbalance Market Administration Charges					100%	\$ 8,600	\$ -	\$ -	\$ -	\$ -	\$ 8,600
Interest Earnings					100%	\$ 3,300	\$ -	\$ -	\$ -	\$ -	\$ 3,300
Intermittent Resource Forecasting Fees		80%	15%		5%	\$ 3,800	\$ 3,040	\$ 570	\$ -	\$ 190	\$ -
Generator Interconnection Project Fees and Application Fees				100%		\$ 1,600	\$ -	\$ 1,600	\$ -	\$ -	\$ -
HANA Administrative Fees*					100%	\$ 1,080	\$ -	\$ -	\$ -	\$ 1,080	\$ -
Metered Sub-Station Penalties					100%	\$ 175	\$ -	\$ -	\$ -	\$ -	\$ 175
Planning Coordinator Fees				100%		\$ 70	\$ -	\$ 70	\$ -	\$ -	\$ -
SC Application Fees					100%	\$ 80	\$ -	\$ -	\$ -	\$ -	\$ 80
Sub-Total (without RC Funding Requirement)						\$ 20,705	\$ 3,040	\$ 4,240	\$ -	\$ 1,270	\$ 12,155
Reliability Coordinator Funding Requirement*					100%	\$ 17,957	\$ -	\$ -	\$ -	\$ 17,957	\$ -
Total Other Costs and Revenue						\$ 38,662	\$ 3,040	\$ 4,240	\$ -	\$ 19,227	\$ 12,155

* Modifications were made to the 2019 Revenue Requirement to include HANA Administrative Fees and a full year's worth of Reliability Coordinator Funding Requirement as these services were not or partially included in the original 2019 Revenue Requirement. As a reminder, the CAISO began offering Reliability Coordinator services July 1, 2019.

OPERATING COST RESERVE ADJUSTMENT

The components of the operating cost reserve adjustment were reviewed and allocated pursuant to *Table 11 — Mapping of Operating Cost Reserve Adjustment to Cost Categories*.

Table 25 — Allocation of Operating Cost Reserve Adjustment to Cost Categories

2019 Modified Revenue Requirement: Operating Cost Reserve Adjustment											
Component	GMC					2019 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											
Adjustment in 15% Reserve for O&M					100%	\$ (1,580)	\$ -	\$ -	\$ -	\$ -	\$ (1,580)
25% Debt Service Reserve for 2013 Bonds					100%	\$ 3,400	\$ -	\$ -	\$ -	\$ -	\$ 3,400
Revenue Changes					100%	\$ 7,122	\$ -	\$ -	\$ -	\$ -	\$ 7,122
Expense Changes					100%	\$ 4,538	\$ -	\$ -	\$ -	\$ -	\$ 4,538
Total Operating Cost Reserve Adjustment						\$ 13,480	\$ -	\$ -	\$ -	\$ -	\$ 13,480

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 9% 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 26 — Allocation of Revenue Requirement to Cost Categories

2019 Modified Revenue Requirement		GMC					
Component	2019 Budget	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect	
<i>budget allocations (amounts in thousands)</i>							
Direct Costs	\$ 151,611	\$ 45,075	\$ 47,608	\$ 1,960	\$ 9,264	\$ 47,704	
Indirect Costs	\$ 3,420	\$ -	\$ -	\$ -	\$ -	\$ 3,420	
Non-ABC Costs	\$ 33,999	\$ 1,606	\$ 566	\$ 44	\$ 1,140	\$ 30,643	
Total O&M	\$ 189,030	\$ 46,681	\$ 48,174	\$ 2,004	\$ 10,404	\$ 81,767	
Debt Service	\$ 16,904	\$ -	\$ -	\$ -	\$ -	\$ 16,904	
Cash Funded Capital	\$ 25,000	\$ -	\$ -	\$ -	\$ -	\$ 25,000	
Total Debt Service and Capital	\$ 41,904	\$ -	\$ -	\$ -	\$ -	\$ 41,904	
Other Costs and Revenues (without RC Funding Requirement)	\$ (20,705)	\$ (3,040)	\$ (4,240)	\$ -	\$ (1,270)	\$ (12,155)	
Operating Cost Reserve Adjustment	\$ (13,480)	\$ -	\$ -	\$ -	\$ -	\$ (13,480)	
Total Other Revenue and Operating Costs Reserve Adj	\$ (34,185)	\$ (3,040)	\$ (4,240)	\$ -	\$ (1,270)	\$ (25,635)	
Revenue Requirement Sub-Total Before Indirect Allocations	\$ 196,749	\$ 43,641	\$ 43,934	\$ 2,004	\$ 9,134	\$ 98,036	
Direct Costs %		44%	45%	2%	9%		
Indirect Costs Allocated Based on Direct Cost %		43,136	44,116	1,961	8,823	(98,036)	
Revenue Requirement Sub-Total Before RC Funding Requirement Adjustment	\$ 196,749	\$ 86,777	\$ 88,050	\$ 3,965	\$ 17,957	\$ -	
RC Funding Percentage		44%	45%	2%	9%		
Reliability Coordinator Funding Requirement	\$ (17,957)	\$ -	\$ -	\$ -	\$ (17,957)	\$ -	
GMC Revenue Requirement	\$ 178,792	\$ 86,777	\$ 88,050	\$ 3,965	\$ -	\$ -	
Cost Category Percentages for GMC Rates		49%	49%	2%			

Step 5: Calculation of 2019 Rates Using New Cost Category Percentages

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

Table 27 — Estimation of Fee Revenue and Mapping of Fees to Cost Categories

2019 Modified Revenue Requirement		Estimated 2019		2019			
Fee	Volumes	Rate	Budget	Market Services	System Operations	CRRs	
<i>(amounts in thousands)</i>							
Bid Segment Fees	69,972,240	\$ 0.005	\$ 350	\$ 350			
Inter-SC Trade Fees	2,367,091	\$ 1.00	\$ 2,367	\$ 2,367			
SCID Fees	334	\$ 1,000	\$ 4,008	\$ 4,008			
TOR Fees	4,604,305	\$ 0.24	\$ 1,105		\$ 1,105		
CRR Auction Bid Fees	730,456	\$ 1.00	\$ 730			\$ 730	
Total			\$ 8,560	\$ 6,725	\$ 1,105	\$ 730	

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 in order to determine the respective rates.

Table 28 — 2019 GMC Rates Using Revised Cost Category Percentages

2019 Modified Revenue Requirement				
Component	2019 Budget	GMC		
		Market Services	System Operations	CRR Services
<i>budget allocations (amounts in thousands)</i>				
GMC Revenue Requirement	\$ 178,792	\$ 86,777	\$ 88,050	\$ 3,965
Less Fees				
Bid Segment Fees	\$ (350)	\$ (350)	\$ -	\$ -
Inter-SC Trade Fees	\$ (2,367)	\$ (2,367)	\$ -	\$ -
SCID Fees	\$ (4,008)	\$ (4,008)	\$ -	\$ -
TOR Fees	\$ (1,105)	\$ -	\$ (1,105)	\$ -
CRR Auction Bid Fees	\$ (730)	\$ -	\$ -	\$ (730)
Total Fees	\$ (8,560)	\$ (6,725)	\$ (1,105)	\$ (730)
Remaining Revenue Requirement to Collect	\$ 170,232	\$ 80,052	\$ 86,945	\$ 3,235
Estimated Volumes				
Estimated Volumes		534,286	450,807	609,490
Less Grandfathered Generation		-	(3,723)	-
Total Estimated Volumes (GWh)		534,286	447,084	609,490
2019 Rates Using Revised Percentages		\$ 0.1498	\$ 0.1945	\$ 0.0053

Summary of GMC Cost Category Percentage Changes

The following table reflects the results of the cost of service analysis. The new percentages specified below will go into effect in January 1, 2021.

Table 29 — Summary of GMC Cost Category Percentage Changes

Cost Category	2016 Study Effective 2018 GMC	2019 Study Effective 2021 GMC	Increase / (Decrease) from Prior
Market Services	32%	49%	17%
System Operations	66%	49%	-17%
CRR Services	2%	2%	0%

The shift from the system operations cost category to the market services cost category is primarily driven by process efficiencies, system improvements, the introduction of the RC services cost category, and automation of services.

With a focus to keep its business processes current and in preparation of kicking off its RC services, the CAISO underwent a corporate wide process improvement and system improvement effort to update its process and project coding system, update its business processes, and re-educate its staff on the proper use of time reporting codes. This effort led to a number of improvements such as improved time card data collected and project data recorded. It also led to a clean-up of the CAISO business process and project coding system. Lastly, this effort reevaluated direct costs vs. indirect costs and the weighting of the process tasks. CAISO's leadership team, as well as business process owners, participated in weighting the business process tasks, which led to a finer granularity of cost drivers.

The introduction of the RC services category also contributed to the shift. A number of the RC functions previously existed in the system operations category as identified in the RC Rate Design proposal. With the introduction of the RC services category, a percentage of those functions were categorized under the RC services category, which caused a shift from the system operations category. The shift contributed to the reduction of the system operations category cost which effectively contributed to the balancing of the costs between the system operations and market services cost categories and their sub-categories.

Improved automation of services, like with Existing Transmission Contract Calculator (ETCC), allowed for improved integration with other tools which allowed CAISO staff to better utilize their time spent of system operations functions and devote more time spent on market services functions.

The combination of the aforementioned shift drivers led to a balancing of the costs as illustrated below; in other words, the costs were split 50/50 between direct and indirect categories. The balancing of direct costs and indirect costs in combination with the new weighting of the tasks resulted in a time and resource shift in the system operations cost category and market services cost category as well as a shift within their sub-categories.

COSS: Direct Costs vs. Indirect Costs History <i>(\$\$ in thousands)</i>		2016		2019	
		\$\$	%	\$\$	%
Direct Costs		\$ 57,780	30%	\$ 89,579	50%
Indirect Costs		\$137,560	70%	\$ 89,213	50%
Total		\$195,340	100%	\$ 178,792	100%
COSS: Cost Category History <i>(\$\$ in thousands)</i>					
		2016		2019	
		\$\$	%	\$\$	%
Market Services		\$ 62,591	32%	\$ 86,777	49%
System Operations		\$129,059	66%	\$ 88,050	49%
CRR Services		\$ 3,690	2%	\$ 3,965	2%
Total		\$195,340	100%	\$ 178,792	100%

Energy Imbalance Market

The EIM provides entities with the opportunity to leverage CAISO's existing real time market platform to facilitate five-minute economic dispatch. The EIM provides reliability and economic benefits to both existing market participants and new EIM entities by utilizing CAISO's 15-minute market and real time dispatch. The EIM relies on CAISO's existing real time portion of the market services activities and system operations activities.

Conceptually, EIM participants will pay the same rate as existing customers but only for the real time market and real time dispatch activities specifically related to EIM. To determine the updated EIM fee, using the

2019 cost of service study, 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 EIM share of all components of the revenue requirement such that EIM participants will pay the same rate as existing customers for the real time activities they are using.

Application of ABC to EIM Rate Structure

As noted earlier, the ABC analysis disaggregated 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 services.

Mapping of Cost Categories to EIM Activities

Market services' real time market and system operations' real time dispatch activities are mapped to the EIM rate structure. These activities are defined, linked to specific processes, and measured using the 12 standard percentage allocations presented in *Table 6 – 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 then in turn were mapped to either the real time market or the day ahead market. The direct ABC level 2 activities

mapped to market services is taken from *Table 6 – Mapping of ABC Direct Operating Activities to Cost Categories*.

Table 30 — Mapping of Market Services ABC Direct Operating Activities

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.

2019 Modified Revenue Requirement: ABC Direct Operating Activities			Market Services Split		
Code	ABC Level 2 Activities	Market Services	Real Time Market	Day Ahead Market	Comments
			category % allocation		
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.
233	Develop Market Design	100%	50%	50%	Efforts support real time market and day ahead market functions equally.
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.
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.

2019 Modified Revenue Requirement: ABC Direct Operating Activities			Market Services Split		
Code	ABC Level 2 Activities	Market Services	Real Time Market	Day Ahead Market	Comments
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.
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.
80008 Plan & Manage Business (PMB)					
455	Manage Technology Collaboration (Internal)	100%	80%	20%	Efforts predominately support real time market functions.
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)					
539	Representing the ISO				
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 7 – Mapping of Non-ABC Support Costs to Cost Categories*.

Table 31 — Mapping of Market Services Non-ABC Support Costs

2019 Modified Revenue Requirement: Non-ABC Support		Market Services Split		Comments
Component	Market Services	Real Time Market	Day Ahead Market	
Non-ABC Support Costs				
Corporate Services Divisions				
SSAE 16 Audit	45%	80%	20%	Use Process 80007, Task 412 allocations.
Market and Infrastructure Development Division (MID)				
Market Surveillance Committee	80%	80%	20%	Use Process 80002, Task 232 allocations.
Technology Division (TECH)				
Intermittent Resource Forecasting Costs	80%	100%		Use Process 80005, Task 353 allocations.
Market Quality and California Regulatory Affairs Division (MQCRA)				
Intermittent Resource Forecasting Costs	80%	100%		Use Process 80005, Task 353 allocations.
General Counsel Division (GC)				
Operations Audit	24%	72%	28%	Use Process 80005 total allocations.

Then other revenue mapped to market services from *Table 10 – Mapping of Other Revenue to Cost Categories* were mapped to real time market and / or day ahead market.

Table 32 — Mapping of Market Services Other Revenue

2019 Modified Revenue Requirement: Other Costs and Revenue		Market Services Split		Comments
Component	Market Services	Real Time Market	Day Ahead Market	
Other Costs and Revenue				
Intermittent Resource Forecasting Fees	80%	100%		Use Process 80005, Task 353 allocations.

Market services fees from *Table 27 – Estimation of Fee Revenue and Mapping of Fees to Cost Categories* are mapped as follows.

Table 33 — Mapping of Market Services Fees

2019 Modified Revenue Requirement		Market Services Split		Comments
Fee	Market Services	Real Time Market	Day Ahead Market	
		(% of cost to allocate to category)		
Bid Segment Fees	100%	50%	50%	Bidding in both markets.
Inter-SC Trade Fees	100%		100%	All in forward market.
SCID Fees	100%	50%	50%	Participate in both markets.

SYSTEM OPERATIONS

The following mapping only addresses those level 2 activities that are mapped to system operations, which then in turn were mapped to either the real time dispatch or balancing authority (BA) services. The direct ABC level 2 activities mapped to system operations is taken from *Table 6 – Mapping of ABC Direct Operating Activities to Cost Categories*.

Table 34 — Mapping of System Operations ABC Direct Operating Activities

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.

2019 Modified Revenue Requirement: ABC Direct Operating Activities			System Operations Split		
Code	ABC Level 2 Activities	System Operations	Real Time Dispatch	BA Services	Comments
			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.
210	Manage Annual Delivery Assessment	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.

2019 Modified Revenue Requirement: ABC Direct Operating Activities			System Operations Split			
Code	ABC Level 2 Activities	System Operations	Real Time Dispatch	BA Services	Comments	
			category % allocation			
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. Efforts support real time dispatch and balancing authority functions equally.
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.
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.
413	Manage Reliability Must Run Settlements	100%	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 non-ABC support costs were mapped from *Table 7 – Mapping of Non-ABC Support Costs to Cost Categories*.

Table 35 — Mapping of System Operations Non-ABC Support Costs

2019 Modified Revenue Requirement: Non-ABC Support Costs		System Operations Split		Comments
Component	System Operations	Real Time Dispatch	BA Services	
		(% of budget allocation)		
Non-ABC Support Costs				
Corporate Services Divisions				
SSAE 16 Audit	45%	100%		Use Process 80007, Task 412 allocations.
Market and Infrastructure Development Division (MID)				
Market Surveillance Committee	15%	100%		Use Process 80002, Task 232 allocations.
Technology Division (TECH)				
Intermittent Resource Forecasting Costs	15%	100%		Use Process 80005, Task 353 allocations.
Market Quality and California Regulatory Affairs Division (MQCRA)				
Intermittent Resource Forecasting Costs	15%	100%		Use Process 80005, Task 353 allocations.
General Counsel Division (GC)				
Operations Audit	52%	58%	42%	Use Process 80005 total allocations.

Then other revenue mapped to system operations from *Table 10 – Mapping of Other Revenue to Cost Categories* were allocated to real time dispatch and / or balancing authority services.

Table 36 — Mapping of System Operations Other Revenue

2019 Modified Revenue Requirement: Other Costs and Revenue		System Operations Split		Comments
Component	System Operations	Real Time Dispatch	BA Services	
		(% of budget allocation)		
Other Costs and Revenue				
California-Oregon Intertie Path Operator Fees	100%		100%	Fees offset system operations costs.
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.
Planning Coordinator Fees	100%		100%	Use Process 80001, Task 204 allocations.

System operations fees from *Table 27 – Estimation of Fee Revenue and Mapping of Fees to Cost Categories* were mapped as follows.

Table 37 — Mapping of System Operations Fees

2019 Modified Revenue Requirement		System Operations Split		Comments
Fee	System Operations	Real Time Dispatch	Balancing Authority Services	
		(% of cost to allocate to category)		
TOR Fees	100%	100%		Real time function.

Costing the Cost Categories to EIM Activities

The amounts from the 2019 cost of service study were applied to the market services and system operations categories to derive the direct real time activity costs.

Table 38 – Components of the 2019 Modified GMC Revenue Requirement

2019 Modified GMC Revenue Requirement		Market Services	System Operations	CRR Services
Component	Budget			
Non-ABC O&M Support Costs	\$ 33,999	\$ 1,606	\$ 566	\$ 44
Direct ABC O&M Costs	\$ 151,611	\$ 45,075	\$ 47,608	\$ 1,960
Debt Service	\$ 16,904	\$ -	\$ -	\$ -
Cash Funded Capital	\$ 25,000	\$ -	\$ -	\$ -
Other Costs and Revenues	\$ (38,662)	\$ (3,040)	\$ (4,240)	\$ -
Operating Costs Reserve Adjustment	\$ (13,480)	\$ -	\$ -	\$ -
Subtotal	\$ 175,372	\$ 43,641	\$ 43,934	\$ 2,004
Indirect Costs	\$ 3,420	\$ 43,136	\$ 44,116	\$ 1,961
GMC Revenue Requirement Before Fees	\$ 178,792	\$ 86,777	\$ 88,050	\$ 3,965
Less Fees	\$ (8,560)	\$ (6,725)	\$ (1,105)	\$ (730)
Remaining Revenue Requirement to Collect	\$ 170,232	\$ 80,052	\$ 86,945	\$ 3,235

Completing the analysis required the following steps:

1. applying EIM activity percentages to non-ABC O&M support costs;
2. applying EIM activity percentages to ABC direct O&M costs;
3. applying EIM activity percentages to other revenue;
4. aggregating costs and allocate indirect costs to EIM activities based on percentage of direct costs and allocation of fees to EIM activities to determine the resulting EIM activity amounts and percentages; and
5. applying the EIM activity percentage to the applicable cost category (market services and / or system operations) to determine the EIM component.

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

The non-ABC support costs from *Table 14 – Allocation of Non-ABC Support to Cost Categories* were allocated using the percentages shown in the *Mapping of Non-ABC Support Costs* tables above (Table 31 and Table 35).

Table 39 – Allocation of Market Services Non-ABC Support Costs

2019 Modified Revenue Requirement: Non-ABC Support Costs		Market Services Split		Market Services Split		
Component	Market Services	Real Time Market	Day Ahead Market	Category Budget	Real Time Market	Day Ahead Market
		% of budget allocation		budget allocations (amounts in thousands)		
Non-ABC Support Costs						
Corporate Services Divisions						
SSAE 16 Audit	45%	80%	20%	\$ 252	\$ 202	\$ 50
Corporate Services Division Total				\$ 252	\$ 202	\$ 50
Market and Infrastructure Development Division (MID)						
Market Surveillance Committee	80%	80%	20%	\$ 251	\$ 201	\$ 50
MID Total				\$ 251	\$ 201	\$ 50
Technology Division (TECH)						
Intermittent Resource Forecasting Costs	80%	100%		\$ 789	\$ 789	\$ -
Technology Total				\$ 789	\$ 789	\$ -
Market Quality and California Regulatory Affairs Division (MQCRA)						
Intermittent Resource Forecasting Costs	80%	100%		\$ 284	\$ 284	\$ -
MQCRA Total				\$ 284	\$ 284	\$ -
General Counsel Division (GC)						
Operations Audit	24%	72%	28%	\$ 30	\$ 22	\$ 8
General Counsel Total				\$ 30	\$ 22	\$ 8
Total Non-ABC Support Costs				\$ 1,606	\$ 1,498	\$ 108

Table 40 – Allocation of System Operations Non-ABC Support Costs

2019 Modified Revenue Requirement: Non-ABC Support Costs		System Operations Split		System Operations Split		
Component	System Operations	Real Time	BA	Category Budget	Real Time	BA
		Dispatch	Services		Dispatch	Services
		% of budget allocation		budget allocations (amounts in thousands)		
Non-ABC Support Costs						
Corporate Services Divisions						
SSAE 16 Audit	45%	100%		\$ 252	\$ 252	\$ -
Corporate Services Division Total				\$ 252	\$ 252	\$ -
Market and Infrastructure Development Division (MID)						
Market Surveillance Committee	15%	100%		\$ 47	\$ 47	\$ -
MID Total				\$ 47	\$ 47	\$ -
Technology Division (TECH)						
Intermittent Resource Forecasting Costs	15%	100%		\$ 148	\$ 148	\$ -
Technology Total				\$ 148	\$ 148	\$ -
Market Quality and California Regulatory Affairs Division (MQCRA)						
Intermittent Resource Forecasting Costs	15%	100%		\$ 53	\$ 53	\$ -
MQCRA Total				\$ 53	\$ 53	\$ -
General Counsel Division (GC)						
Operations Audit	52%	58%	42%	\$ 66	\$ 38	\$ 28
General Counsel Total				\$ 66	\$ 38	\$ 28
Total Non-ABC Support Costs				\$ 566	\$ 538	\$ 28

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

The ABC direct O&M costs from *Table 19 – Allocation of ABC Direct Operating Activities to Cost Categories* were allocated using the percentages shown in the *Mapping of ABC Direct Operating Activities* tables above (Table 30 and Table 34).

Table 41 – Allocation of Market Services ABC Direct Operating Costs

2019 Modified Revenue Requirement: ABC Direct Operating Activities		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>category % allocation</i>		<i>budget allocations (amounts in thousands)</i>		
80001 Develop Infrastructure (DI)							
201	Develop and Monitor Regulatory Contract Procedures	95%	50%	50%	\$ 612	\$ 306	\$ 306
	Total DI				\$ 612	\$ 306	\$ 306
80002 Develop Markets (DM)							
229	Develop State / Federal Regulatory Policy	40%	50%	50%	\$ 127	\$ 64	\$ 63
230	BPM Change Management	80%	50%	50%	\$ 151	\$ 76	\$ 75
231	Develop Infrastructure Policy	40%	50%	50%	\$ 923	\$ 462	\$ 461
232	Perform Market Analysis	80%	80%	20%	\$ 2,638	\$ 2,110	\$ 528
233	Develop Market Design	100%	50%	50%	\$ 1,904	\$ 952	\$ 952
234	Manage Regulatory Contract Negotiations	95%	50%	50%	\$ 349	\$ 175	\$ 174
	Total DM				\$ 6,092	\$ 3,839	\$ 2,253
80004 Manage Market & Reliability Data & Modeling (MMR)							
301	Manage Full Network Model Maintenance	45%	50%	50%	\$ 1,735	\$ 868	\$ 867
304	EMAA Telemetry	50%	100%		\$ 268	\$ 268	\$ -
308	Manage Credit & Collateral	40%	50%	50%	\$ 313	\$ 157	\$ 156
309	Resource Management	50%	80%	20%	\$ 669	\$ 535	\$ 134
320	Provide Stakeholder Training	60%	50%	50%	\$ 463	\$ 232	\$ 231
321	Schedule Coordinator Management	45%	80%	20%	\$ 87	\$ 70	\$ 17
322	Register, Modify and Terminate PDR Resource	100%	50%	50%	\$ 174	\$ 87	\$ 87
323	Calculate & Monitor Energy Costs & Indices	60%	80%	20%	\$ 599	\$ 479	\$ 120
	Total MMR				\$ 4,308	\$ 2,696	\$ 1,612
80005 Manage Market & Grid (MMG)							
352	Manage Day Ahead Market Support	95%		100%	\$ 361	\$ -	\$ 361
353	Operations Real Time Support	80%	100%		\$ 865	\$ 865	\$ -
355	Outage Model & Management	5%	50%	50%	\$ 128	\$ 64	\$ 64
360	Real Time Operations	20%	100%		\$ 2,611	\$ 2,611	\$ -
362	Manage Operations Engineering Support	15%	50%	50%	\$ 602	\$ 301	\$ 301
368	Manage Day Ahead and Market Operations	100%	50%	50%	\$ 2,474	\$ 1,237	\$ 1,237
	Total MMG				\$ 7,041	\$ 5,078	\$ 1,963
	MMG %s				100%	72%	28%

2019 Modified Revenue Requirement: ABC Direct Operating Activities			Market Services Split		Market Services Split			System Operations Split		
Code	ABC Level 2 Activities	Market Services	Real Time Market	Day Ahead Market	Category Budget	Real Time Market	Day Ahead Market	Category Budget	Real Time Dispatch	BA Services
			<i>category % allocation</i>		<i>budget allocations (amounts in thousands)</i>			<i>budget allocations (amounts in thousands)</i>		
80007 Manage Operations Support & Settlements (MOS)										
401	Perform Market Validation	80%	80%	20%	\$ 19	\$ 15	\$ 4	\$ 5	\$ 5	\$ -
402	Manage Dispute Analysis & Resolution	100%	80%	20%	\$ 1,475	\$ 1,180	\$ 295	\$ -	\$ -	\$ -
403	Manage Market Quality System	50%	80%	20%	\$ 287	\$ 230	\$ 57	\$ 229	\$ 229	\$ -
409	Meter Data Acquisition and Processing	100%	50%	50%	\$ 474	\$ 237	\$ 237	\$ -	\$ -	\$ -
411	Manage Market Clearing	45%	50%	50%	\$ 53	\$ 27	\$ 26	\$ 53	\$ 27	\$ 26
412	Manage Market Billing & Settlements	45%	80%	20%	\$ 600	\$ 480	\$ 120	\$ 599	\$ 599	\$ -
414	Manage Settlements Quarterly Release Cycle	45%	80%	20%	\$ 1,046	\$ 837	\$ 209	\$ 1,046	\$ 1,046	\$ -
417	Perform Market Report	80%	80%	20%	\$ 759	\$ 607	\$ 152	\$ 190	\$ 190	\$ -
418	Manage Good Faith Negotiation Requests	100%	50%	50%	\$ 40	\$ 20	\$ 20	\$ -	\$ -	\$ -
419	Manage Price Corrections	50%	80%	20%	\$ 917	\$ 734	\$ 183	\$ 734	\$ 734	\$ -
	Total MOS				\$ 5,670	\$ 4,367	\$ 1,303	\$ 2,863	\$ 2,837	\$ 26
80008 Plan & Manage Business (PMB)										
455	Manage Technology Collaboration (Internal)	100%	80%	20%	\$ 2,570	\$ 2,056	\$ 514	\$ -	\$ -	\$ -
462	Manage Technology Collaboration (External)	100%	50%	50%	\$ 147	\$ 74	\$ 73	\$ -	\$ -	\$ -
	Total PMB				\$ 2,717	\$ 2,130	\$ 587	\$ -	\$ -	\$ -
80009 Support Business Services (SBS)										
504	IT Application, System, & Non-Production Support	80%	50%	50%	\$ 11,200	\$ 5,600	\$ 5,600	\$ 2,100	\$ 1,050	\$ 1,050
511	IT Incident Management	60%	50%	50%	\$ 2,687	\$ 1,344	\$ 1,343	\$ 1,343	\$ 1,343	\$ -
513	IT Problem & Risk Lifecycle Management	60%	50%	50%	\$ 502	\$ 251	\$ 251	\$ 251	\$ 251	\$ -
537	Monitor Markets	80%	50%	50%	\$ 1,590	\$ 795	\$ 795	\$ -	\$ -	\$ -
	Total SBS				\$ 15,979	\$ 7,990	\$ 7,989	\$ 3,694	\$ 2,644	\$ 1,050
80010 Support Customers & Stakeholders (SCS)										
601	Manage Client Inquiries	80%	80%	20%	\$ 1,317	\$ 1,054	\$ 263	\$ 165	\$ 165	\$ -
602	Account Management	80%	80%	20%	\$ 574	\$ 459	\$ 115	\$ 72	\$ 72	\$ -
603	Manage Stakeholder Processes	80%	20%	80%	\$ 765	\$ 153	\$ 612	\$ 96	\$ 96	\$ -
	Total SCS				\$ 2,656	\$ 1,666	\$ 990	\$ 333	\$ 333	\$ -
	Total Direct O&M				\$ 45,075	\$ 28,072	\$ 17,003	\$ 47,608	\$ 22,157	\$ 25,451
	Direct O&M %				100%	62%	38%	100%	47%	53%

Table 42 – Allocation of System Operations ABC Direct Operating Costs

2019 Modified Revenue Requirement: ABC Direct Operating Activities			System Operations Split		System Operations Split		
Code	ABC Level 2 Activities	System Operations	Real Time Dispatch	BA Services	Category Budget	Real Time Dispatch	BA Services
			category % allocation			budget allocations (amounts in thousands)	
80001 Develop Infrastructure (DI)							
202	Manage Generator Interconnection Agreements	100%		100%	\$ 319	\$ -	\$ 319
203	Manage Generator Interconnection Process	100%		100%	\$ 2,765	\$ -	\$ 2,765
204	Manage Long Term Transmission Planning	100%		100%	\$ 6,618	\$ -	\$ 6,618
205	Manage New Transmission Resources	95%		100%	\$ 651	\$ -	\$ 651
206	Manage Transmission Maintenance Standards	100%		100%	\$ 514	\$ -	\$ 514
207	Manage Load Resource Data	100%		100%	\$ 247	\$ -	\$ 247
208	Seasonal Assessment	100%		100%	\$ 284	\$ -	\$ 284
209	Manage Queue Management	100%		100%	\$ 786	\$ -	\$ 786
210	Manage Annual Delivery Assessment	100%		100%	\$ 1	\$ -	\$ 1
	Total DI				\$ 12,185	\$ -	\$ 12,185
80002 Develop Markets (DM)							
229	Develop State / Federal Regulatory Policy	60%		100%	\$ 190	\$ -	\$ 190
230	BPM Change Management	10%	100%		\$ 19	\$ 19	\$ -
231	Develop Infrastructure Policy	60%		100%	\$ 1,385	\$ -	\$ 1,385
232	Perform Market Analysis	15%	100%		\$ 495	\$ 495	\$ -
	Total DM				\$ 2,089	\$ 514	\$ 1,575
80004 Manage Market & Reliability Data & Modeling (MMR)							
301	Manage Full Network Model Maintenance	45%	100%		\$ 1,734	\$ 1,734	\$ -
302	Plan & Develop Operations Simulator Training	95%	100%		\$ 391	\$ 391	\$ -
304	EMAA Telemetry	50%	20%	80%	\$ 269	\$ 54	\$ 215
308	Manage Credit & Collateral	40%	50%	50%	\$ 313	\$ 157	\$ 156
309	Resource Management	50%	50%	50%	\$ 668	\$ 334	\$ 334
310	Manage Reliability Requirements	100%		100%	\$ 1,503	\$ -	\$ 1,503
311	Manage Operations Planning	95%	20%	80%	\$ 1,789	\$ 358	\$ 1,431
312	Manage WECC Studies	100%	20%	80%	\$ 80	\$ 16	\$ 64
314	Manage & Facilitate Procedure Maintenance	95%	20%	80%	\$ 288	\$ 58	\$ 230
316	Plan & Develop Operations Training	95%	100%		\$ 2,051	\$ 2,051	\$ -
317	Execute & Track Operations Training	95%	100%		\$ 1,288	\$ 1,288	\$ -
320	Provide Stakeholder Training	30%	50%	50%	\$ 232	\$ 116	\$ 116
321	Schedule Coordinator Management	45%	20%	80%	\$ 88	\$ 18	\$ 70
323	Calculate & Monitor Energy Costs & Indices	35%	100%		\$ 350	\$ 350	\$ -
	Total MMR				\$ 11,044	\$ 6,925	\$ 4,119

2019 Modified Revenue Requirement: ABC Direct Operating Activities			System Operations Split		System Operations Split		
Code	ABC Level 2 Activities	System Operations	Real Time Dispatch	BA Services	Category Budget	Real Time Dispatch	BA Services
			category % allocation		budget allocations (amounts in thousands)		
80005 Manage Market & Grid (MMG)							
353	Operations Real Time Support	15%	100%		\$ 162	\$ 162	\$ -
355	Outage Model & Management	60%	20%	80%	\$ 1,535	\$ 307	\$ 1,228
360	Real Time Operations	80%	50%	50%	\$ 10,444	\$ 5,222	\$ 5,222
362	Manage Operations Engineering Support	80%	100%		\$ 3,213	\$ 3,213	\$ -
367	Manage Operations Compliance & Event Analysis	50%		100%	\$ 46	\$ -	\$ 46
	Total MMG				\$ 15,400	\$ 8,904	\$ 6,496
	MMG %s				100%	58%	42%
80007 Manage Operations Support & Settlements (MOS)							
401	Perform Market Validation	20%	100%		\$ 5	\$ 5	\$ -
403	Manage Market Quality System	40%	100%		\$ 229	\$ 229	\$ -
411	Manage Market Clearing	45%	50%	50%	\$ 53	\$ 27	\$ 26
412	Manage Market Billing & Settlements	45%	100%		\$ 599	\$ 599	\$ -
413	Manage Reliability Must Run Settlements	100%	100%		\$ 7	\$ 7	\$ -
414	Manage Settlements Quarterly Release Cycle	45%	100%		\$ 1,046	\$ 1,046	\$ -
417	Perform Market Report	20%	100%		\$ 190	\$ 190	\$ -
419	Manage Price Corrections	40%	100%		\$ 734	\$ 734	\$ -
	Total MOS				\$ 2,863	\$ 2,837	\$ 26
80009 Support Business Services (SBS)							
504	IT Application, System, & Non-Production Support	15%	50%	50%	\$ 2,100	\$ 1,050	\$ 1,050
511	IT Incident Management	30%	100%		\$ 1,343	\$ 1,343	\$ -
513	IT Problem & Risk Lifecycle Management	30%	100%		\$ 251	\$ 251	\$ -
	Total SBS				\$ 3,694	\$ 2,644	\$ 1,050
80010 Support Customers & Stakeholders (SCS)							
601	Manage Client Inquiries	10%	100%		\$ 165	\$ 165	\$ -
602	Account Management	10%	100%		\$ 72	\$ 72	\$ -
603	Manage Stakeholder Processes	10%	100%		\$ 96	\$ 96	\$ -
	Total SCS				\$ 333	\$ 333	\$ -
	Total Direct O&M				\$ 47,608	\$ 22,157	\$ 25,451
	Direct O&M %				100%	47%	53%

Step 3: Allocating the Remaining Revenue Requirement Components

The other revenue from *Table 24 – Allocation of Other Revenue to Cost Categories* were allocated using the percentages shown in the *Mapping of Other Revenue* tables above (Table 32 and Table 36).

Table 43 — Allocation of Market Services Other Revenue

2019 Modified Revenue Requirement: Other Costs and Revenue		Market Services Split		Market Services Split		
Component	Market Services	Real Time Market	Day Ahead Market	Category Budget	Real Time Market	Day Ahead Market
				<i>budget allocations (amounts in thousands)</i>		
Other Costs and Revenue						
Intermittent Resource Forecasting Fees	80%	100%		\$ 3,040	\$ 3,040	\$ -

Table 44 — Allocation of System Operations Other Revenue

2019 Modified Revenue Requirement: Other Costs and Revenue		System Operations Split		System Operations Split		
Component	System Operations	Real Time Dispatch	BA Services	Category Budget	Real Time Dispatch	BA Services
		<i>% of budget allocation</i>		<i>budget allocations (amounts in thousands)</i>		
Other Costs and Revenue						
California-Oregon Intertie Path Operator Fees	100%		100%	\$ 2,000	\$ -	\$ 2,000
Intermittent Resource Forecasting Fees	15%	100%		\$ 570	\$ 570	\$ -
Generator Interconnection Project Fees and Application Fees	100%		100%	\$ 1,600	\$ -	\$ 1,600
Planning Coordinator Fees	100%		100%	\$ 70	\$ -	\$ 70
Total Other Costs and Revenue				\$ 4,240	\$ 570	\$ 3,670

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

The CAISO aggregated individual revenue requirements for each category, indirect costs were allocated based on the total of direct costs and fees were allocated as described above.

Table 45 – Mapping Revenue Requirement to Cost Categories

2019 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	\$ 33,999	\$ 1,606	\$ 1,498	\$ 108	\$ 566	\$ 538	\$ 28
Direct ABC O&M Costs	\$ 151,611	\$ 45,075	\$ 28,072	\$ 17,003	\$ 47,608	\$ 22,157	\$ 25,451
Debt Service	\$ 16,904	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Cash Funded Capital	\$ 25,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other Costs and Revenues	\$ (38,662)	\$ (3,040)	\$ (3,040)	\$ -	\$ (4,240)	\$ (570)	\$ (3,670)
Operating Costs Reserve Adjustment	\$ (13,480)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 175,372	\$ 43,641	\$ 26,530	\$ 17,111	\$ 43,934	\$ 22,125	\$ 21,809
Indirect Costs	\$ 3,420	\$ 43,136	\$ 26,223	\$ 16,913	\$ 44,116	\$ 22,217	\$ 21,899
GMC Revenue Requirement Before Fees	\$ 178,792	\$ 86,777	\$ 52,753	\$ 34,024	\$ 88,050	\$ 44,342	\$ 43,708
Less Fees	\$ (8,560)	\$ (6,725)	\$ (2,179)	\$ (4,546)	\$ (1,105)	\$ (1,105)	\$ -
Remaining Revenue Requirement to Collect	\$ 170,232	\$ 80,052	\$ 50,574	\$ 29,478	\$ 86,945	\$ 43,237	\$ 43,708
			63%	37%		50%	50%

Step 5: Calculation of the EIM Components of the 2019 Cost Category Rates

The percentages from Table 45 were applied to the cost categories' real time component's rate from

Table 28 – 2019 GMC Rates Using Revised Cost Category Percentages.

Table 46 – Calculation of the EIM 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	\$ 80,052	\$ 0.1498	Real Time Market	63%	\$ 50,574	\$ 0.0947
System Operations	\$ 86,945	\$ 0.1945	Real Time Dispatch	50%	\$ 43,237	\$ 0.0967

Summary of EIM Cost Category Percentage Changes

A comparison of the EIM cost category percentages from the 2016 and 2019 cost of service studies is shown highlighted below. As noted earlier, the study shows that 16% of market services' resources shifted from the real time market functions to day ahead market functions. In addition, 11% of system operations' resources shifted from balancing authority functions to real time dispatch functions. The driver of the shifts is a balancing of efforts between the market services and system operations functions and responsibilities.

Table 47 – Summary of EIM Cost Category Percentage Changes

Cost Category	Sub-Category	2016 Study Effective 2018 GMC	2019 Study Effective 2021 GMC	Increase / (Decrease) from Prior
Market Services	Real Time Market	79%	63%	-16%
	Day Ahead Market	21%	37%	16%
System Operations	Real Time Dispatch	39%	50%	11%
	Balancing Authority	61%	50%	-11%

Reliability Coordinator Services

In January 2018, CAISO announced plans to become the RC for entities within its footprint and to offer the service to all balancing authorities and transmission operators in the West. Shortly after, CAISO began a public process to develop its RC services. In November 2018, FERC approved the rates, terms, and conditions for the RC services. CAISO collaborated with entities, regulators, and other RC service providers to work toward its certification, and to create procedures for logistics and operations. CAISO completed the NERC certification process led by the Western Electricity Coordinating Council (WECC), allowing it to provide RC services. In the first phase, RC West became the RC of record for 16 entities as of July 1, 2019. The November 1, 2019 cutover marked the second phase of a transition of power grid oversight responsibility. RC West is now the RC for 42 entities in the Western Interconnection, overseeing 87 percent of the load in the western United States.

Most of the process and tasks necessary to support the RC services were already identified in 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 2019 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 CAISO to leverage against the stability of its annual revenue requirement to develop an annual RC funding requirement thus benefiting both the RC customers and the existing GMC customers.

By mapping the tasks to the RC cost category, the CAISO is able 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 that of the GMC cost category percentages in that the RC funding percentage is multiplied against the revenue requirement in order to determine the RC funding requirement. The RC funding requirement is then divided by the reported MWh to determine the RC rate/MWh.

Table 48: Allocation of Revenue Requirement to RC Cost Category

2019 Modified Revenue Requirement						
Component	2019 Budget	GMC			Reliability Coordinator	Indirect
		Market Services	System Operations	CRR Services		
<i>budget allocations (amounts in thousands)</i>						
Direct Costs	\$ 151,611	\$ 45,075	\$ 47,608	\$ 1,960	\$ 9,264	\$ 47,704
Indirect Costs	\$ 3,420	\$ -	\$ -	\$ -	\$ -	\$ 3,420
Non-ABC Costs	\$ 33,999	\$ 1,606	\$ 566	\$ 44	\$ 1,140	\$ 30,643
Total O&M	\$ 189,030	\$ 46,681	\$ 48,174	\$ 2,004	\$ 10,404	\$ 81,767
Debt Service	\$ 16,904	\$ -	\$ -	\$ -	\$ -	\$ 16,904
Cash Funded Capital	\$ 25,000	\$ -	\$ -	\$ -	\$ -	\$ 25,000
Total Debt Service and Capital	\$ 41,904	\$ -	\$ -	\$ -	\$ -	\$ 41,904
Other Costs and Revenues (without RC Funding Requirement)	\$ (20,705)	\$ (3,040)	\$ (4,240)	\$ -	\$ (1,270)	\$ (12,155)
Operating Cost Reserve Adjustment	\$ (13,480)	\$ -	\$ -	\$ -	\$ -	\$ (13,480)
Total Other Revenue and Operating Costs Reserve Adj	\$ (34,185)	\$ (3,040)	\$ (4,240)	\$ -	\$ (1,270)	\$ (25,635)
Revenue Requirement Sub-Total Before Indirect Allocations	\$ 196,749	\$ 43,641	\$ 43,934	\$ 2,004	\$ 9,134	\$ 98,036
Direct Costs %		44%	45%	2%	9%	
Indirect Costs Allocated Based on Direct Cost %		43,136	44,116	1,961	8,823	(98,036)
Revenue Requirement Sub-Total Before RC Funding Requirement Adjustment	\$ 196,749	\$ 86,777	\$ 88,050	\$ 3,965	\$ 17,957	\$ -
RC Funding Percentage		44%	45%	2%	9%	
Reliability Coordinator Funding Requirement	\$ (17,957)	\$ -	\$ -	\$ -	\$ (17,957)	\$ -
GMC Revenue Requirement	\$ 178,792	\$ 86,777	\$ 88,050	\$ 3,965	\$ -	\$ -
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 9% RC funding percentage. There is no change in the RC funding percentage from that of the initial calculation as part of CAISO's Reliability Coordinator Rate Design, Terms and Conditions proposal.

Table 49– Summary of RC Funding Percentage Changes

Cost Category	2016 Modified Study Effective 2019 GMC	2019 Study Effective 2021 GMC	Increase / (Decrease) from Prior
Reliability Coordinator Services	9%	9%	0%

In addition to mapping the RC related efforts, CAISO revisited the tasks necessary to support load serving and generator only entities. This effort required outreach to the various subject matter experts that support RC services such as from the RC, Operations Planning and Operations Compliance groups. The general feedback was, whereas the number of

requirements to support generator only facilities is lower, it was determined the same operations and planning tasks are required to ensure reliability throughout the interconnection footprint. In conclusion, CAISO determined that there is no separation of duties between supporting a load serving entity and generator only entity that supports a change in the RC rate design.

Supplemental Fees

As a final focus of the 2019 cost of service study, CAISO analyzed the efforts that support other supplemental services. The 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 process applications and statements has increased. These supplemental fees are designed to help recoup some of the costs that a new, or additional, Scheduling Coordinator (SC) or CRR customer has on systems and labor resources. While some of the costs are supported through the volumetric charges of the GMC, these supplemental fees represent a portion of the resource impact that any new entity, large or small, has. The CAISO is proposing to increase fees that have remained unchanged for more than 10 years.

Conversely, the study has shown that resources to support TOR efforts have decreased due to streamlined processes and automation. The decrease in costs and higher volumes support a decrease in the TOR fee from \$0.24 per MWh to \$0.18 per MWh. 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. The CAISO is not proposing any other change in supplemental fees.

Table 50– Summary of Supplemental Fee Changes

Fee	Billing Units	Current Fee	Updated Fee
Bid Segment Fee	per bid segment	\$ 0.0050	No Change
Inter SC Trade Fee	per Inter SC Trade	\$ 1.0000	No Change
Scheduling Coordinator ID Fee	per month	\$ 1,000	\$ 1,500
TOR Fees	minimum of supply or demand TOR MWh	\$ 0.2400	\$ 0.1800
CRR Bid Fee	number of nominations and bids	\$ 1.00	No Change
Intermittent Resource Forecasting Fee	per MWh	\$ 0.1000	No Change
Scheduling Coordinator Application Fee	per application	\$ 5,000	\$ 7,500
CRR Application Fee	per application	\$ 1,000	\$ 5,000
HANA Administrative Fee	annual fee	\$ 45,000	No Change
HANA Setup Fee	one time fee	\$ 35,000	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

CAISO provides support on an emergency basis for flows on TOR, in a manner similar to standby service.

2. Scheduling

CAISO provides check-outs with neighboring balancing authorities (BA) in order to schedule flows across boundaries.

3. Outage Management

CAISO provides for the scheduling and coordination of outages across the BA.

4. Settlements

CAISO utilizes its settlements system and processes to charge TOR fees.

Application of ABC to TOR Fee 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 51 –ABC Direct Operating Activities for TORs

Transmission Ownership Rights (TOR) Fee		
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 \$38.9 million in direct and indirect costs were allocated to TORs. CAISO reached this conclusion by identifying the costs for the specific level 2 activities from the 2019 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 52 – Calculation of TOR Related Costs

Transmission Ownership Rights (TOR) Fee			
Calculation of TOR Costs			
ABC Code	Task Code	ABC Level 2 Activity	Amount (\$ in thousands)
80004	301	Manage Full Network Model (FNM) Maintenance	\$ 1,734
80004	311	Manage Operations Planning	\$ 1,789
80004	312	Manage WECC Studies	\$ 80
80005	355	Manage Outages	\$ 1,535
80005	360	Real Time Operations	\$ 10,444
80005	362	Manage Operations Engineering Support	\$ 3,213
80007	411	Manage Market Clearing	\$ 53
80007	412	Manage Market Billing & Settlements	\$ 599
		Applicable Direct Costs	\$ 19,447
		Total System Operations Direct Costs	\$ 43,934
		Percentage of TORs to System Operations Direct Costs	44%
		Total System Operations Indirect Costs	\$ 44,116
		Percentage Per Above	44%
		Applicable Indirect Costs	\$ 19,411
		Total TOR Related Costs	\$ 38,858

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 53 - TORs as a Percentage of Gross Volumes

Transmission Ownership Rights (TOR) Fee		
TOR Flow		
		Volumes (in MWh)
	System Operations Volume	442,538,230
	Add Back Grandfathered Contracts	3,723,000
	TOR Supply	4,339,223
	TOR Demand	4,313,917
	Total Adjusted System Operations Volume	454,914,369
	Total Gross TOR Volume (Supply and Demand)	8,653,140
	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 fee is then determined by dividing the TOR costs to collect by the minimum of actual TOR supply or actual TOR demand for 2019. The revised TOR fee is as follows

Table 54 – Calculation of TOR Fee

Transmission Ownership Rights (TOR) Fee		
TOR Fee Calculation		
		Amount
	Total Applicable Direct and Indirect Costs	\$ 38,858,040
	TOR as a Percentage of Gross Volume	2.00%
	TOR Costs to Collect	\$ 777,161
	TOR MWh for 2019 (min. of supply and demand)	4,313,917
	TOR Fee per MWh	\$ 0.1800

Summary of TOR Fee Changes

Despite a decrease in the applicable TOR costs, the TOR related costs to collect increased by \$157,549 from the last cost of service study due to TOR having a higher percentage of gross volume. However, the cost to collect divided by the increased MWh resulted in a reduction of the TOR fee from \$0.2400 per MWh to \$0.1800 per MWh. CAISO proposes to decrease the TOR fee to \$0.1800 per MWh effective January 1, 2021. The revenue collected from the TOR fee will offset costs recovered through the System Operations charge rate.

Table 55 – Summary of TOR Fee Changes

Transmission Ownership Rights (TOR) Fee		2016 COSS	2019 COSS	Increase / (Decrease) From Prior
TOR Fee Calculation				
		Amount	Amount	Amount
	Total Applicable Direct and Indirect Costs	\$ 61,961,200	\$ 38,858,040	\$ (23,103,160)
	TOR as a Percentage of Gross Volume	1.00%	2.00%	1.00%
	TOR Costs to Collect	\$ 619,612	\$ 777,161	\$ 157,549
	TOR MWh for 2019 (min. of supply and demand)	2,627,260	4,313,917	1,686,657
	TOR Fee per MWh	\$ 0.2400	\$ 0.1800	\$ (0.0600)

Application Fees

The SC application fee is one of the original fees the CAISO has assessed since inception. The fee is intended to cover the processing and setup costs for an applicant to become a certified scheduling coordinator eligible to transact business directly with the CAISO. The fee amount was last changed in 2007. As part of the 2019 cost of service study, CAISO evaluated the actual cost of processing applications, establishing connectivity, evaluating financial security, and providing training. When the hours to perform these functions per application are applied against a general burden rate per hour the cost to process a SC application is \$7,500.

The CRR application fee is assessed on any load serving entity (LSE) that desires to become a candidate CRR Holder so that they can participate in the CRR allocation process to request CRRs. CRRs are important to LSEs since they are a financial instrument used to offset congestion charges for the scheduled load in the day

ahead market. These entities are allocated CRRs based on the load serving obligation of the LSE. The CRR application fee was introduced in 2012; the fee amount has not changed since. As with the SC application fee, CAISO evaluated the actual cost of processing applications, establishing connectivity, evaluating financial security, and providing training. When the hours to perform these functions per application are applied against a general burden rate per hour the cost to process a CRR application is \$5,000.

CAISO proposes to increase the SC application fee to \$7,500 and the CRR application fee to \$5,000 effective January 1, 2021. The revenue collected from these fees will offset the annual GMC revenue requirement.

Scheduling Coordinator ID Administrative Fee

The SCID administrative fee was originally designed to limit the number of SCIDs to those needed for legitimate business purposes in order to reduce the additional burden on CAISO systems and resources that an unlimited number of SCIDs could create. However, since the fee was last assessed in 2012, the cost to support the settlements system and provide monthly statements and invoices has increased beyond the \$1,000 per month per SCID fee amount due to general inflation and system maintenance costs. In its evaluation as illustrated in *Table 56 – Calculation of SCID Fee* below, CAISO concluded the SCID fee should increase to \$1,500 per month to cover supporting system and labor costs from contributing groups such as Contracts, Credit, Resource Management, SC Management, Market Quality, Settlement, and IT.

CAISO proposes to increase the SCID administrative fee to \$1,500 effective January 1, 2021. The revenue collected from the SCID fee will offset costs recovered through the Market Services charge rate.

Table 56 – Calculation of SCID Fee

Scheduling Coordinator ID Fee			2019 COSS
SCID Related Costs			
ABC Code	Task Code	ABC Level 2 Activity	Amount (\$ in thousands)
80001	201	Develop and Monitor Regulatory Contract Procedures	\$ 612
80004	308	Manage Credit & Collateral	\$ 313
80004	309	Resource Management	\$ 669
80004	321	Schedule Coordinator Management	\$ 87
80007	403	Manage Market Quality System	\$ 287
80007	412	Manage Market Billing & Settlements	\$ 600
80009	519	Provision and Manage Access	\$ 561
		Applicable Direct Costs	\$ 3,129
		Total Market Services Direct Costs	\$ 43,641
		Percentage of SCIDs of Market Services Direct Costs	7%
		Total Market Services Indirect Costs	\$ 43,136
		Percentage Per Above	7%
		Applicable Indirect Costs	\$ 3,020
		Total SCID Related Costs	\$ 6,149
SCID Fee Calculation			
			Amount
		Total Applicable Direct and Indirect Costs	\$ 6,148,520
		Number of SCIDs (12/2019)	341
		Annual Cost per ID	\$ 18,031
		Monthly Cost per ID	\$ 1,503
		Monthly Fee per ID (rounded)	\$ 1,500

Attachment B, Exhibit 2 – Estimated Cost Calculations
For the PCA between
California Departments of Water Resources
and the
California Independent System Operator Corporation
April 27, 2021

Long Term Transmission Planning Cost Calculation

Reference Documents

2019 Cost of Service Study and 2021 GMC Update

<http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=2958ae2a-84d6-4baa-b2f8-02e84571b0cb>

Cost of Long Term Transmission Planning (LTPP) (amounts in thousands)

Component	Code	Market Services	System Operations	CRR Services	Reliability Coordinator	Indirect	Amount	LTPP Factor	Allocation to LTPP	Identifier	Formula
Allocation of Direct Costs (ABC Level 2 Activities)											
Develop Infrastructure	80001										
Develop & Monitor Regulatory Contract Procedures	201	95%			5%		\$ 644	0%	\$ -		
Manage Generator Interconnection Agreements (GIA)	202		100%				\$ 319	0%	-		
Manage Generator Interconnection Process (GIP)	203		100%				\$ 2,765	0%	-		
Manage Long Term Transmission Planning	204		100%				\$ 6,618	50%	3,309		
Manage Transmission and Resource Implementation	205		95%		5%		\$ 685	0%	-		
Manage Transmission Maintenance Standards	206		100%				\$ 514	0%	-		
NERC/ WECC Loads & Resources Data Requests	207		100%				\$ 247	0%	-		
Seasonal Assessment	208		100%				\$ 284	0%	-		
Manage Queue	209		100%				\$ 786	0%	-		
Manage Annual Delivery Assessment	210		100%				\$ 1	0%	-		
Total LTPP Direct Costs									\$ 3,309	(1)	= \$6,618 x factor of 50%
<i>Note: Information pulled from the 2019 Cost of Service Study.</i>											
Allocation of Indirect Costs											
Total Direct Net System Operations Costs (before allocation of indirect costs)									\$ 43,934	(2)	
Percentage of LTPP costs to ABC level 2 Direct Costs									7.53%	(3)	= (1) / (2)
Total System Operations Indirect Dollars Allocated									\$ 44,116	(4)	
Total LTPP Indirect Costs									\$ 3,323	(5)	= (3) * (4)
Total Long Term Transmission Planning Costs									\$ 6,632	(6)	= (1) + (5)
Annual Planning Coordinator Service Charge Calculation											
Total number of transmission circuits in ISO 2019 Transmission Plan									1,571	(7)	
LTPP cost per transmission circuit in ISO 2019 Transmission Plan									\$ 4.22	(8)	= (6) / (7)
Total number of transmission circuits in CDWR's system									4	(9)	
Annual Planning Coordinator Service Charge (\$ in 1000s)									\$ 16,885	(10)	= (8) * (9)

Long Term Transmission Planning Processes

Exhibit 1 - Business Process Framework v4.0 with Charge codes

http://www.caiso.com/documents/Exhibit1-BusinessProcessFrameworkV4_0-ChargeCodesJan29_2014.pdf

<http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=2958ae2a-84d6-4baa-b2f8-02e8457fb0cb>

From Page 2 - Develop Infrastructure (DI) 80001

Manage Long Term Transmission Plan activity code 204

Component of LTPP	%
1) ISO Transmission Plan: Produce a forward-looking, coordinated transmission plan that provides for full NERC/WECC compliance obligations as well as proactive infrastructure planning initiatives, including economic transmission that facilitates a robust and efficient market	50%
2) Support CPUC Resource Adequacy (RA) through the determination of all LCR requirements for the ISO Controlled Grid; the determination of all import, zonal, and inter-zonal allocations that are used to define RA obligations for the LSEs	5%
3) Generator Interconnection Study obligations	5%
4) Renewable Integration analysis to assess operational reliability and infrastructure requirements to meet 33% requirements by 2020	5%
5) On an annual basis, assess and validate feasibility of all Long-term CRRs	5%
6) Perform annual congestion studies to a) Define and summarize term "significant and reoccurring" congestion b) Develop mitigation plan c) Provide the upgrade and congestion costs	10%
7) Conduct Deliverability and Locational Capacity Studies in support of the CPUC resource adequacy requirements	5%
8) Generation and transmission reliability assessment (i.e., Planning Reserve Margin and transmission probabilistic planning)	5%
9) Sub-regional/Regional/National work on Planning Issues through NERC, FERC, and WECC	5%
10) Special projects; Represent the ISO in technical groups and committees	5%
Total	100%