COUNCIL AGENDA: 6/26/18
FILE: 18-937
ITEM: 7.1

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO: HONORABLE MAYOR AND CITY COUNCIL

FROM: Lori Mitchell

SUBJECT: SEE BELOW

DATE: June 11, 2018

Approved D. DSyL Date 6/14/18

SUBJECT: CRITERIA FOR AN INTEGRATED RESOURCE PLAN FOR SAN JOSE CLEAN ENERGY

RECOMMENDATION

Adopt a resolution:

(a) Approving the criteria for an Integrated Resource Plan ("IRP") which details procurement plans to ensure San José Clean Energy ("SJCE") meets the program goals and has a reliable and cost-effective electricity supply; and
(b) Delegating to the City Manager authority to file such plan that is consistent with the criteria in Attachment 1 and that complies with all California Public Utilities Commission ("CPUC") requirements by August 1, 2018; and require SJCE to present an updated IRP every two years to City Council for review and approval by March of all even years.

OUTCOME

Approving the criteria for an IRP for SJCE and authorizing the City Manager to file a plan that is consistent with the approved criteria and all CPUC requirements by August 1, 2018 will allow SJCE to meet its regulatory requirements. It will also inform San José Clean Energy's procurement process in preparation for commencing service to its customers.

BACKGROUND

In May of 2017, City Council approved proceeding with the establishment of SJCE, a Community Choice Aggregation program ("CCA") to serve San José. In August of 2017, City Council approved a resolution adopting the SJCE Implementation Plan and Statement of Intent and directed staff to submit this document to the CPUC. The SJCE Implementation Plan

included a guiding framework,[1] a program phase-in plan,[2] and a load forecast & resource plan.[3] On September 19, 2017, the Implementation Plan was submitted to the CPUC. The CPUC certified the plan on December 19, 2017. On January 30, 2018, the City Council revised the phase in plan for SJCE.[4] On February 27, 2018, City Council unanimously approved Climate Smart San José, a bold plan to reduce GHG related to energy and mobility (transportation and land use) and to ensure long term water supply. Climate Smart San José updated the resource goals for SJCE to achieve San José's goal of upholding and honoring the Paris Climate Agreement.[5]

On February 13, 2018, the CPUC issued Decision 18-02-018 directing all Load Service Entities including the Investor Owned Utilities CCAs and Energy Service Providers to file Integrated Resource Plans (IRPs) with the CPUC no later than August 1, 2018 and by May 1 every even numbered year thereafter.[6] D.18-02-018 applies to any CCA that has an approved implementation plan from the Commission as of the scheduled IRP filing date even if it is not yet serving load.[7] An IRP takes a 10-year-ahead look at system needs including reliability needs of the overall electric system; local needs including reliability needs specific to areas with transmission limitations; and flexibility needs such as the resources needed to integrate renewables. D.18-02-018 requires Load Service Entities to present their supply plans through 2030 and assess their resulting GHG emissions.

D. 18-02-018 directs CPUC staff to maintain, update and make continuously available a template for IRPs.[8] D. 18-02-018 delegated to the assigned Commissioner and/or assigned Administrative Law Judge the authority to finalize greenhouse gas and local air pollution accounting protocols to be used in the IRPs.[9] ***On May 25, 2018, the Administrative Law Judge issued a ruling on the greenhouse gas emission accounting methods to be used in the IRPs.[10] On that day, CPUC staff provided revised templates for preparation and submission of the IRP.*** These templates are attached to this Memorandum as Attachment 2. The CPUC is continuing to provide guidance to CCAs on how to best use the templates. This guidance is expected to continue to occur in the months of June and July of 2018. SJCE will continue to work with the CPUC to ensure SJCE's IRP complies with the revised templates.

The CPUC will use the IRP process to plan for reliable, cost-effective electric service and ensure that Load Service Entities achieve their GHG reduction obligations. It will review the IRPs

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[1] San José Clean Energy Implementation Plan at 1.
[2] San José Clean Energy Implementation Plan at 14.
[3] San José Clean Energy Implementation Plan at 16-27.

[5] Climate Smart San Jose at 10, 79-82, 151, 154
[6] D.18-02-018 at [XX].
[7] D.18-02-018 at 165, 170.
[8] D.18-02-018at 173.
[9] D.18-02-018at 175.
[10] R.16-02-007, Administrative Law Judge's Ruling Finalizing Greenhouse Gas Emissions Accounting Methods, Load Forecasts, and Greenhouse Gas Benchmarks for Individual Integrated Resource Plan Filings, May 25, 2018.

submitted by all Investor Owned Utilities, Community Choice Aggregators, and Energy Service Providers, conduct production cost modeling that aggregates all these IRPs, assess achievement of applicable GHG reduction, RPS and reliability requirements. The CPUC may use the IRP process to provide additional procurement and policy guidance.[11]

ANALYSIS

The SJCE Implementation Plan required SJCE to "plan for meeting the electricity needs of its customers utilizing resources consistent with its policy goals and objectives as well as applicable legislative and regulatory mandates" and to "develop integrated resource plans that meet supply objectives that balance cost, risk, City Council policy, and environmental considerations."[12] SJCE's 2018 IRP will inform San José Clean Energy's procurement in preparation for commencing service to its customers and allow SJCE to meet CPUC regulatory requirements.

Staff recommends that City Council adopt criteria for the development of an IRP and authorize the City Manager to file SJCE's 2018 IRP with the CPUC on August 1 so that SJCE can meet the requirements of CPUC D.18-02-018. The criteria set forth in Attachment 1 are based on the policies and goals already adopted by City Council in the SJCE Implementation Plan and Climate Smart San José, as well as the requirements of State Law. The SJCE Implementation Plan and Climate Smart San José were subject to extensive public discussion and comment, thus adopting criteria based on these documents will reflect extensive public input. The IRP that SJCE submits in August will be primarily prospective until SJCE's completes its' RFP process and additional procurement is authorized by City Council.

Staff recommends SJCE submit an updated IRP for approval to City Council every two years no later than March of even numbered years. CPUC D.18-02-018 provides that in odd years the CPUC will undertake modeling and develop reference plans and other inputs that the Investor Owned Utilities, CCAs and Energy Service Providers must use in their IRPs. D.18-02-018 directs these entities to file updated IRPs on May 1 of even numbered years using the inputs developed in the odd years. City Council approval of SJCE's updated IRPs in March should ensure that an updated SJCE IRP is ready for filing with the CPUC by the applicable deadline and should allow enough time for the CPUC to finalize the inputs for the plan before SJCE must prepare it. This timeline may be adjusted depending on future CPUC regulatory requirements.

EVALUATION AND FOLLOW-UP

Staff will submit an information memo with the final IRP submitted to the CPUC to City Council in August 2018.

[11] D.18-02-018 at 16, 21-22.
[12] SJCE Implementation Plan at 9.

PUBLIC OUTREACH

This memorandum will be posted on the City's website for the June 26, 2018 City Council meeting.

COORDINATION

This memorandum has been coordinated with the City Attorney's Office.

COMMISSION RECOMMENDATION/INPUT

There is no commission recommendation or input associated with this action. Staff will review the 2018 SJCE IRP Criteria with the Clean Energy Community Advisory Committee on July 9 along with the status of the IRP development effort.

FISCAL/POLICY ALIGNMENT

The recommended actions support the City's 2017 Green Vision (Goals 2 and 3) and the Envision San José 2040 General Plan (Goal MS-2 and Appendix 8: GHG Reduction Strategy).

CEQA

Not a Project, File No. PP17-003, Agreements/Contracts (New or Amended) resulting in no physical changes to the environment.

/s/
LORI MITCHELL
Director, Community Energy Department

For questions, please contact Lori Mitchell, Director of Community Energy Department, at (408) 535-4880

Attachment 1 – 2018 SJCE IRP CRITERIA
Attachment 2 – IRP Submission Templates

Attachment 1 – 2018 SJCE IRP CRITERIA

- The 2018 SJCE IRP criteria are based on SJCE's previously approved implementation plan and Climate Smart San Jose. These plans detailed the policies and goals for SJCE.
- SJCE will phase in service to San Jose residents and businesses as follows:
    - September 2018 municipal load;
    - March 2019 remaining load.
- SJCE will offer at least one power mix option with a rate equal to or less than PG&E's rates.
- SJCE will offer at least one power mix option at 10 percent or more renewables than PG&E.
- SJCE will offer at least one power mix option that is 100 percent renewable.
- SJCE's initial resource mix will include a proportion of renewable energy exceeding California's prevailing Renewable Portfolio Standard (RPS) procurement mandate.
- By 2021, SJCE's residents will have a base power mix that is 100% Greenhouse Gas emissions (GHG) free.
- SJCE will maintain, at minimum, low income programs at the same level as PG&E.
- After becoming established, SJCE will develop local programs including energy efficiency, demand response, distributed generation and renewable energy.
- SJCE will encourage distributed renewable generation in the local area through the offering of a net energy metering tariff; a standardized power purchase agreement or "Feed-In Tariff"; and other creative, customer-focused programs targeting increased access to local renewable energy sources.
- By 2030, SJCE's base offering will be at least 60% renewable.
- By 2030, San José will have 668MW of local renewables and by 2040, San José will be the world's first one GW solar city.
- By 2030, 60% of all passenger vehicles in the City will be electric.
- By 2020, 100 percent of new homes will be ZNE, and by 2030, 25 percent of existing homes will be energy efficient and all-electric.
- SJCE will comply with all applicable State Law including the Renewable Portfolio Standard, Resource Adequacy requirements, and GHG reduction requirements.
- SJCE's IRP shall comply with the CPUC's requirements with respect to disadvantaged communities including identifying the disadvantage communities SJCE will serve, describing the impacts of such service on the disadvantaged communities, and setting forth SJCE's plans to benefit these communities.

Attachment 2 - IRP Submission Templates

ATTACHMENT A

Standard LSE Plan

[NAME OF FILING ENTITY]

2018 INTEGRATED RESOURCE PLAN

[DATE]

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How to use this template:

- *Instructions are provided in italics under each section. Delete all instructions before submitting the form, but preserve the numbered section headings.*
- *Complete each section. If the section is not applicable to the LSE, simply indicate "Not applicable" and provide a brief explanation.*
- *Definitions are provided in the Glossary of Terms at the end of this template.*

1. Executive Summary

Use this section to provide an overview of the process used by the LSE to develop its plan and summarize the LSE's findings, including a brief overview of the LSE's Preferred Portfolio and Action Plan.

2. Study Design

Use this section to describe how the LSE approached the process of developing its LSE Plan.

Load Assignments for Each LSE

For projecting load across the IRP Planning Horizon (i.e., until 2030, for the purposes of IRP 2017-18), LSEs shall use the "mid Baseline mid AAEE mid AAPV" version of Form 1.1c of the CEC's adopted 2017 IEPR forecast, unless a new load projection is assigned to the LSE in an Administrative Law Judge (ALJ) ruling.

An ESP may re-purpose its load forecast previously filed with the Commission, provided the load forecast is consistent with the one submitted by the ESP to the CEC in its 2017 IEPR Confidential Form 7.1 (Loads and Resources under Contract). Smaller ESPs—specifically, those ESPs with annual peak loads under 200 MW and which are not required to file IEPR Confidential Form 7.1—should utilize their most recent load forecast submission for resource adequacy purposes and extend that annual energy requirement (in GWh) out to 2030. ESP load forecasts should be filed under seal, and the Commission staff will aggregate the ESP submittals to protect confidentiality.

Required and Optional Portfolios

Each LSE must produce at least one portfolio, deemed the "Conforming Portfolio," that uses the assigned load forecast and is demonstrated to be consistent with the Reference System Portfolio according to the following criteria:

- *Use of either the GHG Planning Prices in Table A or the LSE-Specific 2030 GHG Emissions Benchmark assigned to the LSE in an ALJ ruling.*
- *Use of inputs and assumptions (e.g., baseline generating fleet, candidate resource cost assumptions, financial assumptions, etc.) matching those used in developing the Reference System Portfolio, with the following exceptions based on updated information:*

- *LSEs shall align with the load assignment indicated above, namely the "mid Baseline mid AAEE mid AAPV" version of Form 1.1c of the CEC's adopted 2017 IEPR demand forecast, unless superseded by Administrative Law Judge ruling, as closely as possible.*
- *LSE load modifier assumptions shall be consistent with the 2017 IEPR demand forecast projections of both PV and non-PV self-generation, and load-modifying demand response included in the "mid Baseline mid AAEE mid AAPV" case.*
- *LSEs shall use the 2017 IEPR burner-tip natural gas price projections, which are based on the April 2018 Updated Model.*[1]

LSEs may also study and report "Alternative Portfolios" developed from additional scenarios using different assumptions (including differing load and load modifier assumptions) from the Reference System Plan. Alternative Portfolios may assume that other LSEs do not procure in a manner consistent with the Reference System Plan. For example, an IOU may choose to prepare a portfolio that plans for CCA load departure not reflected in its assigned IEPR load forecast. IOUs doing so shall adjust their 2030 GHG Emissions Benchmark (if applicable) downward proportionally with the departing load.

For all Alternative Portfolios developed, any deviations from the Conforming Portfolio must be explained and justified. If the LSE uses different load and load modifier assumptions as part of any Alternate Portfolios, the LSE should report that information using the standard IEPR filing form templates associated with that information, as described in detail in Section 5: Data.

Among the Conforming Portfolio and Alternative Portfolio(s) developed by the LSE, the LSE will identify one as its "Preferred Portfolio."

GHG Planning Price

LSEs electing to use the GHG Planning Price—rather than the LSE-specific GHG Emissions Benchmark—in developing their portfolio(s) must use the values presented in Table A below. The GHG Planning Price is equivalent to the marginal cost of GHG abatement associated with the 42 MMT Scenario for the years 2018 to 2026 (i.e., a curve that slopes upward from ~$15/ton to ~$23/ton), followed by a straight-line increase from ~$23/ton in 2026 to $150/ton in 2030. The straight-line increase is intended to fill the gap for the years for which RESOLVE does not produce GHG abatement cost values (i.e., 2027, 2028, and 2029).

[1] Available at: www.energy.ca.gov/assessments/ng_burner_tip.html.

TABLE A

GHG Planning Price ($ per metric ton of CO2e) for use in IRP	
2018	*$15.17*
2019	*$16.05*
2020	*$16.94*
2021	*$17.88*
2022	*$18.86*
2023	*$19.91*
2024	*$21.02*
2025	*$22.19*
2026	*$23.44*
2027	*$55.08*
2028	*$86.72*
2029	*$118.36*
2030	*$150.00*

GHG Emissions Benchmark

LSEs electing to use the LSE-specific GHG Emissions Benchmark—rather than the GHG Planning Price—in developing their portfolio(s) must use the 2030 value assigned to the LSE in the most recent ALJ ruling.

If the total emissions attributable to the LSE's Preferred Portfolio exceed its GHG Emissions Benchmark for 2030, the LSE must explain the difference and describe additional measures it would take over the following 1-3 years to close the gap, along with the estimated cost of those measures.

Each ESP is required to calculate its own confidential GHG Emissions Benchmark based on its 2030 load share within the host EDU's territory, consistent with instructions provided in D.18-02-018. For ESPs that serve load in more than one IOU service territory, those ESPs should add up the separate GHG Emissions Benchmarks calculated based on its share of direct access load for each IOU service territory to result in a single benchmark.

GHG Accounting in IRP Planning

LSEs should use the Clean Net Short Methodology and calculator tool for GHG accounting.

a. Objectives

Provide a description of the LSE's objectives for the analytical work it is documenting in the IRP.

b. Methodology

i. Modeling Tool(s)

Name all modeling software used by LSE to develop its IRP, if any, and include the vendor and version number. Provide an explanation of differences between the LSE's modeling tool and RESOLVE, and an explanation of how those differences should be considered during evaluation of the LSE's portfolio(s).

ii. Modeling Approach

Describe the LSE's overall approach to developing the scenarios it evaluated, and explain why each scenario was considered. Also describe any calculations, including post-processing calculations, used to generate metrics for portfolio analysis.

iii. Assumptions

Describe any inputs or assumptions used by the LSE that differ from the corresponding assumption used by the Commission to prepare the Reference System Plan. Each differing assumption must include a rationale for use of this assumption and any intermediate calculations used to develop the assumption and source data with citations. Include a side-by-side comparison of the original assumption data from the Reference System Plan and the LSE's differing assumption data. Report data according to the requirements in the Data section below.

3. Study Results

Use this section to present the results of the analytical work described in Section 2: Study Design.

a. Portfolio Results

Provide a list of all portfolios developed. Each portfolio's content must be itemized in the Data Template Excel workbooks referenced below. A portfolio clearly identifies:

- *New resources that the LSE plans to invest in. This does not include future contracts with existing resources.*

- *Existing resources that the LSE owns or contracts with. This includes future contracts with existing resources. Existing resources are those on the 3/15/2018 NQC List,[2] or projects not yet online but that have secured a contract and may therefore be identified in the Commission's RPS Contracts Database or an Application filed at the Commission, as of January 1, 2018.*

Each LSE must produce a Conforming Portfolio. Alternative Portfolios are also permitted, provided that any deviations from the Conforming Portfolio are explained and justified. The LSE will identify one portfolio as its Preferred Portfolio.

b. Preferred and Conforming Portfolios

Describe the portfolio the LSE prefers to use for planning purposes (i.e., Preferred Portfolio) and for which LSE seeks Commission approval or certification. Explain the reasons for the LSE's preference and how its Preferred Plan is consistent with each relevant statutory and administrative requirement (refer to PU Code Section 454.52(a)(1)). In providing its rationale, the LSE should assume that other LSEs procure in a manner consistent with the Reference System Plan.

If an LSE chooses the Conforming Portfolio as its Preferred Portfolio, the reporting requirements for those portfolios are one and the same.

However, if an LSE chooses an Alternative Portfolio as its Preferred Portfolio, because an LSE is required to explain and justify any deviations between its Preferred Portfolio and its Conforming Portfolio, the LSE is expected to provide all information requested in Sections 3, 4, and 5 for both portfolios. In other words, the LSE should present the results for two portfolios, provide evidence showing how both portfolios minimize localized air pollutants and how it will affect the costs for its customers, and provide an action plan associated with both portfolios.

i. Local Air Pollutant Minimization

Describe and provide quantitative evidence to support how the LSE's Preferred Portfolio minimizes localized air pollutants and other GHG emissions with early priority on disadvantaged communities.

In order to identify "disadvantaged communities" that are located within its service territory, each LSE must use CalEnviroScreen 3.0 to identify the top 25% of impacted census tracts on a statewide basis and the top 5% of census tracts without an overall score but with highest pollution burden. LSEs must specify:

[2] http://cpuc.ca.gov/irp/filingtemplates/

- *Customers served in disadvantaged communities along with total disadvantaged population number served as a percentage of total number of customers served*
- *What current and planned LSE activities/programs, if any, impact disadvantaged communities or contribute to economic development within disadvantaged communities (e.g. list all individual programs carried out in/for disadvantaged communities, along with description of program)*
- *Estimates of annual emissions of nitrogen oxides and particulate matter[3] (NOx and PM2.5, at a minimum), including emissions from normal plant operations and from plant cycling. As stated above, the Commission delegates to staff and the assigned ALJ to define a GHG accounting methodology apportioning responsibility to individual LSEs. The method may also be used to estimate localized pollutants such as nitrogen oxides and particulate matter.*

ii. Cost and Rate Analysis

Describe and provide quantitative information to reflect how the LSE anticipates that its Preferred Portfolio will affect the costs for its customers. For this analysis, assume other LSEs procure resources in a manner consistent with the Reference System Plan.

Requirements for IOUs Only

Data must be provided showing the forecasted revenue requirement and system average rate for bundled customers for all portfolios developed by the IOU. The costs should be forecasted consistently with the categories covered by each IOU in its general rate case. The data should reflect the IOU's assigned load forecast (for the conforming portfolio), and revenue requirements for each portfolio should be broken down by the following categories:

- *Transmission*
- *Distribution (e.g. includes costs from distribution upgrades driven by customer-generation)*
- *DSM Programs (e.g. includes costs of energy-efficiency, demand response, and other programs)*
- *Generation (e.g. includes costs of utility-owned generation, bilateral contracts, renewables contracts, and storage contracts, net of revenue from EDU allowances)*
- *Other (e.g. includes nuclear decommissioning, DWR bonds, public purpose programs, and other miscellaneous)*

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[3] LSEs are encouraged to use factors from the CEC Cost of Generation (2015) and the USEPA AP-42, the EPA's compilation of air emission factors.

In presenting revenue requirement data, IOUs should clearly distinguish between current (baseline) projected revenue requirement broken down by the categories above, and the incremental projected revenue requirement broken down by the same categories, for each new resource portfolio that the IOU is showing results for in its Plan. IOUs should assume no procurement on behalf of non-bundled customers would be needed unless specifically required by the Commission. Report all assumptions used such as cost escalation rate, inflation rate, levelization period, discount rate, taxes, financing, etc. For the conforming portfolio, assumptions should align with those used in the RESOLVE model to the extent possible.

Requirements for All LSEs

All LSEs should consider cost and rate impacts on their customers when planning and submitting their individual IRPs, and, at a minimum, include a narrative description of their approach in support of this requirement.

Additionally, LSE Plans should account for any resources subject to the cost allocation mechanism (CAM) in their portfolios. In estimating the resource adequacy benefits of resources subject to the CAM in its Conforming Portfolio, each LSE should refer to the most recent year-ahead CAM resource list available on the Commission's Resource Adequacy Compliance Materials webpage.[4] The year-ahead CAM list itemizes the resource adequacy value benefiting all LSEs within a given IOU service territory, by month and year. In developing its IRP portfolios, LSEs should assume its future resource adequacy obligations are reduced by its proportional share of the resource adequacy value itemized in the year-ahead CAM list. An LSE's proportional share is determined by its year-ahead share of peak load out of total coincident peak load for the IOU service territory the LSE is located in, as assigned in the Commission's annual resource adequacy process. The LSE's proportional share is assumed static through the IRP planning horizon for the purpose of projecting its share of CAM resource adequacy value, but will be updated each IRP cycle based on the current proportional share assignment from the Commission's annual resource adequacy process. LSEs should not make assumptions or predictions on what resources may be procured on behalf of all load and subject to the CAM in the future.

c. Deviations from Current Resource Plans

Describe and quantify any differences in the quantities and/or budgets for procurement between the LSE's Preferred Plan and any currently filed or authorized resource plans, including, but not limited to: Bundled Plans, RPS Plans, Energy Efficiency Business Plans, Distributed Resource Plans, and specific procurement-related applications.

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[4] Refer to the Commission's Resource Adequacy Compliance Materials, available at: http://cpuc.ca.gov/General.aspx?id=6311.

d. Local Needs Analysis

LSEs that serve load within a CAISO-defined local capacity area must report the LSE's own assessment of how it will meet the local capacity needs projected in the most recent CAISO Transmission Plan.[5] In doing so, LSEs should use the Local Capacity Technical Analysis (LCT) reports for years 2018 and 2022 associated with the CAISO board-approved 2017-18 Transmission Plan when developing the local needs analysis of their Conforming Portfolios. LSEs may use the 2017 IEPR-based final LCT reports for 2019 and 2023 (expected to be available by the end of May2018 at the latest) to develop a local needs analysis in their Alternative Portfolios.[6] LSEs should use the Commission's resource adequacy program's definition of local capacity areas for the purposes of the local needs analysis. These areas are: Greater Bay Area, Big Creek Ventura, CAISO System, LA Basin, San Diego IV, and Other PG&E.

4. Action Plan

This section will present all the actions that the LSE proposes to take in the next 1-3 years to implement its LSE Plan.

a. Proposed Activities

Describe any near-term activities the LSE proposes to undertake across resource types in order to implement its LSE Plan, including any information on proposed and procurement-related activities as required by the Commission decision on IRP. Clearly describe how each proposed activity relates to the study results presented in Section 3: Study Results. As stated in Section 3.b., if the LSE chooses a portfolio other than its Conforming Portfolio as its Preferred Portfolio, it should use this section to describe Proposed Activities for both portfolios. To the extent that any proposed activities would apply to both portfolios, the LSE may indicate as such rather than duplicate information.

Additionally, use this section to describe planned activities to conduct outreach and seek input from any disadvantaged communities that could be impacted by procurement resulting from the implementation of the LSE's Plan. Include the criteria used to evaluate any proposed procurement located in disadvantaged communities (e.g., use of any scoring bonuses or any other mechanisms LSE has implemented to ensure its preferred portfolio complies statutory requirements related to procurement of projects in disadvantaged communities, as described in Sections 454.5(b)(9)(D)(i-ii), and 399.13(a)(7)(A-B)).

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[5] CAISO has ten primary local capacity areas (i.e. transmission-constrained load pockets): Humboldt, North Coast North Bay, Sierra, Stockton, Greater Bay, Greater Fresno, Kern, LA Basin, Big Creek Ventura, San Diego Imperial Valley.

[6] LCT reports are available at: www.caiso.com/informed/Pages/StakeholderProcesses/LocalCapacityRequirementsProcess.aspx.

b. Barrier Analysis

Identify any market, regulatory, financial, or other barriers or risks associated with the LSE acquiring the resources identified in the Preferred Portfolio. Include an analysis of any risks associated with potential retirement of existing resources on which the LSE intends to rely in the future.

c. Proposed Commission Direction

If applicable, describe any direction that the LSE seeks from the Commission, including any new spending authorizations, changes to existing authorizations, or changes to existing programmatic goals or budgets. Clearly relate any requested direction to the study results, proposed activities, and barrier analysis presented above.

5. Data

LSE IRP Plans require reporting of various data types. Baseline resource portfolio data shall be reported in the "Baseline Resource Data Template," and new resource portfolio data shall be reported in the "New Resource Data Template." The most recent versions of both data templates are provided by the Commission on the IRP Filing Materials and Templates webpage.[7] *Other information that is not asked for in these data templates but is asked for in the reporting requirements described in the preceding sections shall follow the guidelines below in section 5c.*

Staff expects that each LSE will have only one Baseline Resource Data Template workbook reporting baseline data, i.e. no difference in baseline between the LSE's "Conforming Portfolio" or any "Alternative Portfolios." In contrast, an LSE may have multiple New Resource Data Template workbooks reporting new resource data, i.e. one workbook for the "Conforming Portfolio" and one workbook for each "Alternative Portfolio." However, staff anticipates some LSEs may have situations where they have differing baselines in the "Conforming Portfolio" vs. any "Alternative Portfolios." To allow for this possibility, the filename for the Baseline Resource Data Template shall include an identifier field to identify it as Conforming or Alternative, as described below.

All cost data should be reported using 2016 dollars. Convert nominal dollars using the IEPR dollar deflator series posted to the IRP Filing Materials and Templates webpage.[8]

a. Baseline Resource Data Template

Follow the instructions within the template to report all resources under obligation to serve LSE load whether through an existing contractual or ownership relationship. This includes resources on the

[7] Available at: http://www.cpuc.ca.gov/irp/filingtemplates/.

[8] Available at: http://www.cpuc.ca.gov/irp/filingtemplates/.

3/15/2018 NQC List, or projects not yet online but that have secured a contract and may therefore be identified in the Commission's RPS Contracts Database or an Application filed at the Commission, as of January 1, 2018. For situations where the LSE is reporting a current or future contract with unknown existing resource(s), report this information in this workbook, NOT the New Resource Data Template. Existing Feed In Tariff contracts (which do not have a CAISO Resource ID) are also reported in this workbook. Existing shares of CAM system capacity as assigned in CPUC's Resource Adequacy program and projected to future years are also reported in this workbook.

This template also asks for existing fixed cost and revenue requirement projections, if applicable to the reporting entity.

Save the file in the format of "Data_LSEname_BaseRsrc_Identifier_yyyymmdd.xlsx" where the field "LSEname" is replaced with the LSE name (only letters allowed, no spaces or other characters), the field "Identifier" is replaced with Conforming, Alternative1, Alternative2, etc., and "yyyymmdd" is replaced with the date the file is submitted to the Commission. Spaces are not allowed in the file name. Special characters are not allowed, except for underscore ("_") and dash ("-").

b. New Resource Data Template

For EACH portfolio considered by the LSE (e.g. Conforming, Alternative1, Alternative2) follow the instructions within the template to report new resources, including the projected total fixed costs of these new resources, that the LSE plans to invest in to serve its load over the IRP planning horizon. The fixed cost reporting includes any new transmission triggered by the new resources and the LSE's share of those costs. IOUs shall also include a projection of the incremental revenue requirement (i.e., incremental to what is reported in the Baseline Resource Data Template). New resources are analogous to "candidate" resources as defined in the RESOLVE model. To the extent possible, each resource should be mapped to a RESOLVE candidate resource type. If the LSE's selected new resource does not match with any pre-defined RESOLVE candidate resource type, it may select "Other_New" and provide a description.

Note that the Conforming Portfolio will be based on the load assignments and the 2017 IEPR demand forecast as specified earlier in this template (unless superseded by ALJ ruling). If an LSE proposes no changes to this load and load modifier assumption as part of its LSE Plan, then no load information must be reported. If LSEs use different load and load modifier assumptions as part of any Alternative Portfolios, the LSE should report that information using the standard IEPR filing form templates associated with that information, included as tabs within the New Resource Data Template. The LSE should clearly identify the data that differs from the forms it submitted to the CEC in 2017 as part of the 2017 IEPR process. The table below indicates which standard IEPR filing forms apply to which entity.

Form #	Form Description	IOU	CCA	ESP
Form 1.1a	RETAIL SALES OF ELECTRICITY BY CLASS OR SECTOR (GWh) Bundled & Direct Access	X		
Form 1.1b	RETAIL SALES OF ELECTRICITY BY CLASS OR SECTOR (GWh) Bundled Customers	X		
Form 1.2	DISTRIBUTION AREA NET ELECTRICITY FOR GENERATION LOAD (GWh)	X		
Form 1.3	LSE COINCIDENT PEAK DEMAND BY SECTOR (Bundled Customers)	X		
Form 1.4	DISTRIBUTION AREA COINCIDENT PEAK DEMAND	X		
Form 3.2	ENERGY EFFICIENCY - CUMULATIVE INCREMENTAL IMPACTS	X		
Form 3.3	DISTRIBUTED GENERATION - CUMULATIVE INCREMENTAL IMPACTS	X		
Form 3.4	DEMAND RESPONSE - CUMULATIVE INCREMENTAL IMPACTS	X		
Form 4	REPORT ON FORECAST METHODS AND MODELS	X	X	
Form 6	UNCOMMITTED DEMAND-SIDE PROGRAM METHODOLOGY	X		
Form 7.1	ESP DEMAND FORECAST			X
Form 7.2	CCA DEMAND FORECAST		X	

Each LSE should save a separate file for each portfolio in the format of "Data_LSEname_NewRsrc_Identifier_yyyymmdd.xlsx" where the field "LSEname" is replaced with the LSE name (only letters allowed, no spaces or other characters), the field "Identifier" is replaced with Conforming, Alternate1, Alternate2, etc., and "yyyymmdd" is replaced with the date the file is submitted to the Commission. Spaces are not allowed in the file name. Special characters are not allowed, except for underscore ("_") and dash ("-").

c. Other Data Reporting Guidelines

The LSE will need to report supplemental or supporting data such as annual emissions estimates that is requested within the Standard LSE Plan Template instruction above but is not part of the Excel Workbook Baseline Resource or New Resource Data Templates. LSEs should report such data or any other supporting data in one or more Excel-compatible workbooks.

Save a separate file for each portfolio in the format of "Supporting_LSEname_Identifier_yyyymmdd.xlsx" where the field "LSEname" is replaced with the LSE name (only letters allowed, no spaces or other characters), the field "Identifier" is replaced with Conforming, Alternative1, Alternative2, etc., and "yyyymmdd" is replaced with the date the file is

submitted to the Commission. Spaces are not allowed in the file name. Special characters are not allowed, except for underscore ("_") and dash ("-").

6. Lessons Learned

Document any suggested changes to the IRP process for consideration by the Commission. Explain how the change would facilitate the ability of the Commission and LSEs to achieve state policy goals.

Glossary of Terms

Alternative Portfolio *– LSEs are permitted to submit "Alternative Portfolios" developed from scenarios using different assumptions from those used in the Reference System Plan. Any deviations from the Conforming Portfolio must be explained and justified.*

Conforming Portfolio *– Each LSE must produce a "Conforming Portfolio" that is demonstrated to be consistent with the Reference System Portfolio according to the following criteria: (1) use of either the GHG Planning Prices or the LSE-Specific 2030 GHG Emissions Benchmark, (2) use of input assumptions matching those used in developing the Reference System Portfolio, and (3) consistent with the 2017 IEPR "mid Baseline mid AAEE mid AAPV" forecast, unless superseded by Administrative Law Judge ruling.*

Data Template *– Data provided by the LSE should be reported in the "Baseline Resource Data Template" and the "New Resource Data Template" provided by the Commission. "Baseline" means existing resources and costs. "Existing" includes resources on the 3/15/2018 NQC List, or projects not yet online but that have secured a contract and may therefore be identified in the Commission's RPS Contracts Database or an Application filed at the Commission, as of January 1, 2018. "New" means any new (incremental to the baseline) resources and costs associated with a particular LSE portfolio.*

Disadvantaged Communities *– For the purposes of IRP, and consistent with the results of the California Communities Environmental Health Screening Tool Version 3 (CalEnviroScreen 3.0), "disadvantaged communities" refer to the 25% highest scoring census tracts in the state along with the 22 census tracts that score in the highest 5% of CalEnviroScreen's pollution burden, but which do not have an overall CalEnviroScreen score because of unreliable socioeconomic or health data.*

GHG Emissions Benchmark *– Each LSE filing a Standard LSE Plan must use either the GHG Emissions Benchmark or GHG Planning Price in developing its Conforming Portfolio. The LSE-specific benchmarks have been provided in an ALJ ruling. If the total emissions attributable to the LSE's preferred portfolio exceed its GHG Emissions Benchmark for 2030, the LSE must explain the difference and describe additional measures it would take over the following 1 - 3 years to close the gap, along with the cost of those measures.*

GHG Planning Price *–The GHG Planning Price is equivalent to the marginal cost of GHG abatement associated with the 42 MMT Scenario for the years 2018 to 2026 (i.e., a curve that slopes upward from ~$15/ton to ~$23/ton), followed by a straight-line increase from ~$23/ton in 2026 to $150/ton in 2030, as shown in Table A. Each LSE must use either the GHG Planning Price or GHG Emissions Benchmark in developing its Conforming Portfolio.*

IRP Planning Horizon *– The IRP Planning Horizon will typically cover 20 years. However, for the purposes of this IRP 2017-18 cycle, the IRP Planning Horizon will cover only up to the year 2030.*

Long term *– 10 or more years (unless otherwise specified)*

Portfolio *– A portfolio is a set of supply and/or demand resources with certain attributes that together serve a particular level of load.*

Preferred Portfolio *– Among all the portfolios developed by the LSE, the LSE will identify one as the most suitable to its own needs, deemed its "Preferred Portfolio." Any deviations from the Conforming Portfolio must be justified and explained.*

Reference System Plan *– The Reference System Plan refers to the Commission-approved integrated resource plan that includes an optimal portfolio (Reference System Portfolio) of future resources for serving load in the CAISO balancing authority area and meeting multiple state goals, including meeting GHG reduction and reliability targets at least cost.*

Reference System Portfolio *– The Reference System Plan refers to the Commission-approved portfolio that is responsive to statutory requirements per Pub. Util. Code 454.51; it is part of the Reference System Plan.*

Scenario *– A scenario is a portfolio together with a set of assumptions about future conditions.*

Short term *– 1 to 3 years (unless otherwise specified)*

Standard LSE Plan *– A Standard LSE Plan is the type of integrated resource plan that an LSE is required to file if its assigned load forecast is ≥ 700 GWh in any of the first five years of the IRP planning horizon.*

Standard LSE Plan Template *– Each LSE required to file a Standard LSE Plan must use the Standard LSE Plan Template according to the instructions provided herein.*

(End of Attachment A)

Integrated Resource Planning (R.16-02-007)

Filing Requirements Reference Guide

Version: May 25, 2018

This document is a reference guide for LSEs required to file Plans in the IRP process. It provides clarifying instructions on how to fulfill the Standard and Alternative LSE Plan requirements detailed in D.18-02-018. The questions included in this document reflect some of the questions IRP staff has received during informal meetings with representatives from various LSEs. Staff has documented and shared the questions and answers to ensure all LSE Plans are developed in a consistent and comprehensive manner.

This Reference Guide will serve as a living document. IRP staff will continue to update it with added guidance for LSEs as new questions arise. All updates will be posted to the IRP Filing Materials webpage.

Inputs and Assumptions

1. **In general, are LSEs required to use the Reference System Plan Inputs and Assumptions when developing their own LSE plans?**

   For Conforming Portfolios, LSEs should be aligning with the 2017 IEPR as closely as possible (including aligning fuel prices) and they should rely on Reference System Plan inputs and assumptions for all other data (e.g., baseline generating fleet, candidate resource cost assumptions, financial assumptions, etc.).

   - 2017 IEPR burner tip fuel price projections are based on the April 2018 Updated Model available at: http://www.energy.ca.gov/assessments/ng_burner_tip.html
   - 2017 IEPR carbon allowance price projections are found at: http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-03/TN222145_20180116T123231_2017_IEPR_Revised_Carbon_Allowance_Price_Projections.xlsx
   - Reference System Plan inputs and assumptions for all other data should be derived from the RESOLVE model released in September 2017. Descriptive information is documented in the RESOLVE Inputs and Assumptions document, also posted September 2017.

2. **How should LSEs treat the "Other Electrification" component in the IEPR forecast?**

   The "Other Electrification" component in the IEPR refers to other transport-related electrification (e.g. ports, high-speed rail, airport ground equipment). The IEPR does not include a building electrification component, as previously indicated. Given that LSEs should be aligning with the 2017 IEPR forecast as closely as possible, they should assume that Other Electrification is "other transport electrification" and not building electrification.

3. **What ELCC values should be assumed when measuring an LSE's capacity position?**

   When procuring from existing resources to fill out future capacity position for RA compliance, LSEs should use the 3/15/2018 NQC List (which includes a worksheet showing technology-specific factors), thus inferring use of average ELCC as determined by the RA proceeding (see D. 17-06-027). When procuring NEW resources (a facility that does not exist today) to fill out future capacity position, or energy and capacity position, LSEs should use the marginal ELCCs

established in Attachment B to D.18-02-018. This means using marginal ELCCs for counting the RA capacity of new resources and for evaluating bids from new resource solicitations.

4. **Which vintage of NQC values should LSEs use in portfolio development?**

   LSEs should utilize the NQC list used for RA Year-Ahead compliance dated 3/15/2018. The 3/15/2018 version is permanently posted to the CPUC's IRP website here.

5. **Which LCR report should LSEs use for the local needs analysis?**

   LSEs should use the Local Capacity Technical Analysis (LCT) reports for years 2018 and 2022 associated with the CAISO board-approved 2017-18 Transmission Plan when developing the local needs analysis of their Conforming Portfolios. LSEs may use the 2017 IEPR-based final LCT reports for 2019 and 2023 (expected to be available by the end of May2018 at the latest) to develop a local needs analysis in their Alternative Portfolios. LCT reports are available here.

6. **Which EV charging (and other load modifier) shapes are LSEs expected to use? Should these data come from the 2017 IEPR or from RESOLVE's RSP outputs?**

   LSEs should use the 2017 IEPR for all load modifiers and load shapes, which are available on CEC's IEPR website here.

7. **Should LSEs use real or nominal dollars in developing their LSE Plans?**

   All cost data (including generator O&M, startup costs, and fuel handling costs) shall be adjusted to 2016 dollars using a deflator series developed by the CEC (posted to website here) in the IEPR process, which equates to approximately 2% inflation, year over year. This is consistent with the convention in the RESOLVE model to report all costs in 2016 dollars.

8. **The burner-tip gas prices provided by the CEC in its April 2018 update seem high. The gas prices are approximately $1 over IHS values (and actual prices in 2018). Can LSEs use a different gas price in its Conforming Portfolio?**

   No, LSEs should all be using the CEC's forecast for their Conforming Portfolios. The CEC's gas price forecast is in line with the EIA Annual Energy Outlook for 2018, comparing reference case Henry Hub prices. Furthermore, the prices were vetted through the WECC Anchor Dataset data subcommittee where representatives from CAISO, SDG&E and PG&E were present. The April 2018 burner tip price projections are the result of this WECC wide collaboration.

Completing the Standard LSE Plan Template (Word version)

9. **Section 2 of the Standard LSE Plan Template provides several pages of discussion and instruction on topics such as load data assumptions and GHG accounting. Are these topics intended to be included in Section 2 of the LSE Plan?**

Section 2 was a logical place to include the instructions because it covers the approach to portfolio development, but "Section 3: Study Results" is where LSEs should present the results of using those assumptions, methodology, etc.

10. After Section 3.b, in which the Preferred Portfolio and rationale are identified, it appears that all required information and evaluations should be solely associated with the Preferred Portfolio and there is no further evaluation or description of the Conforming or Alternative Portfolio(s). Is this the correct understanding?

There are two possibilities: (1) An LSE chooses the Conforming Portfolio as its Preferred Portfolio, in which case the reporting requirements for those portfolios are one and the same; or (2) An LSE chooses an Alternative Portfolio as its Preferred Portfolio. In the latter case, because an LSE is required to explain and justify any deviations between its Preferred Portfolio and its Conforming Portfolio, the LSE is expected to provide all information requested in Sections 3, 4, and 5 for *both* portfolios. In other words, the LSE should present the results for two portfolios, provide evidence showing how both portfolios minimize localized air pollutants and how it will affect the costs for its customers, and provide an action plan associated with both portfolios.

As a reminder, for each portfolio considered by the LSE (including Alternative Portfolios), please follow the instructions within the New Resource Data Template to report new resources.

11. Under "Section 3.b.ii. Cost and Rate Analysis," which requirements apply to which types of LSEs?

The section titled IOU Requirements applies only to IOUs. The section titled All LSEs applies to all LSEs, including IOUs.

Data Reporting in the Standard Plan Data Template (Excel)

12. Does baseline resource reporting include contracted resources that are not yet online?

Yes. Specifically, baseline includes resources on the 3/15/2018 NQC List, or projects not yet online but that have secured a contract and may therefore be identified in the Commission's RPS Contracts Database or an Application filed at the Commission, as of January 1, 2018.

13. Is "Energy_Contract_MW" or "Capacity_Contract_MW" intended to represent NQC capacity or nameplate capacity?

Report nameplate MW in the column "Nameplate_MW." Report NQC (or estimated NQC if not yet online) in the column "Contract_MW". CPUC staff revised the Data Template and replaced the columns "Energy_Contract_MW" and "Capacity_Contract_MW" with a single column called "Contract_MW." The distinction between contract type would be reported in the column "Owner_Contract_Type."

14. What is the proper way to complete the data templates, given that they seem to require filling in multiple rows and drop-down menus?

The template is designed to accommodate the fact that some contracts have different capacity numbers for each month and year. Staff asks for the data in this flat and granular format to capture these kinds of cases. Staff will be using scripts and programs to import the data, so staff can handle many lines of data from dozens of LSEs. The important thing is uniform format from all LSEs.

15. Questions related to the "New Resource Data Template":

a. Should the Mid AAEE from the IEPR be included in this table?

For the Conforming Portfolio, the LSE Plan should be consistent with the 2017 IEPR mid-mid AAEE case, so there is nothing additional for LSEs to report in this template. For any alternative portfolios, LSEs may propose alternatives to the 2017 IEPR mid-mid AAEE case. These would be considered modifications to the LSE's planned load and reported on the corresponding IEPR forms referenced in the "Instructions_IEPR_Forms" worksheet. Cost information associated with incremental demand-side programs would be reported on the "New_Costs" worksheet. (Cost information associated with baseline demand-side programs, e.g. consistent with the 2017 IEPR mid-mid AAEE case, would be reported in the Baseline Resource Data Template, "Baseline_Costs" worksheet.)

b. Should the incremental rooftop PV be included in this table?

See answer for Mid AAEE above. For the Conforming Portfolio, LSEs should be consistent with the 2017 IEPR mid committed BTM PV plus mid-mid AAPV case.

c. Are LSEs required to use RESOLVE model input assumptions for resource prices for future generic resources, such as a new solar contract in 2026?

For the Conforming Portfolio, yes. For Alternative Portfolio(s), no.

d. Are the units for the "New_Rsrc_Total_Fixed_Cost" a total dollar value or a $/MW value?

Total dollars. This does not include any transmission costs, as these are reported in separate columns on this worksheet.

e. How should LSEs report a new RA contract that is likely from an existing system resource? The specific resource will not be known. This would be a new resource commitment to the LSE's portfolio with a new cost but not a new resource added to the system.

This should be reported in the Baseline Resource Data Template, NOT the New Resource Data Template. The resource in question is part of the system baseline and not new steel-in-the-ground. CPUC staff revised the posted Baseline Resource Data Template to accommodate this special case.

Alternative LSE Plan Requirements

16. One of the requirements for LSEs filing Type 1 Alternative Plans is to submit CEC Form S-1. However, only those LSEs with annual peak loads greater than 200 MW are required to file this form in the first place. Do these smaller LSEs still have to submit Form S-1 to the CPUC?

Yes. CPUC staff will need information on each LSE's capacity position, large and small, in order to represent them correctly when assembling the aggregate system portfolio and conducting production cost modeling for the Preferred System Plan. Detailed instructions for how to complete the Form S-1 are available in the CEC Staff Report, "Forms and Instructions for Submitting Electricity Resource Plans."

17. For ESPs that are exempt from filing with the IEPR due to their small size, which load forecast should they use to calculate their GHG benchmark, and how should they calculate it?

ESPs in this situation should utilize their most recent load forecast submission for resource (RA) adequacy purposes and to extend that annual energy requirement (in GWh) out to 2030. Those ESPs should then follow the same instructions for other ESPs described in D.18-02-018 for calculating their individual GHG benchmarks.

Requirements Related to Disadvantaged Communities

18. Does staff have any additional guidance on how to approach the requirement to minimize local air pollutions and other GHG emissions with early priority on disadvantaged communities (DAC)?

LSEs are required to estimate emissions and examine whether emissions increase or decrease in DACs. Beyond that, Energy Division staff has no specific guidance and is open to different ideas for how to go about prioritizing emissions reductions in DACs.

19. What level of granularity does Energy Division staff expect for DAC demographic information?

Each LSE should provide a qualitative description of the demographics of the DAC customers it serves. The finest level of granularity would be census tracts, but LSEs may summarize at the county subdivision level. LSEs are also asked to propose and justify what they believe is the appropriate level of granularity.

20. What additional guidance can Energy Division staff provide regarding how each LSE should calculate air pollutant emissions?

The Decision does not specify what emissions factors LSEs should use, but one method would be to use fuel burn output and apply emission factors. Staff's analysis used factors from the CEC Cost of Generation (2015) and the USEPA AP-42, the EPA's compilation of air emission factors. LSEs are encouraged, but not required, to use EPA's factors.

21. Is Production Cost Modeling on the Reference System Plan going to identify air pollutant emissions estimates for the system portfolio?

Yes, generally by resource class and SERVM region (of which there are eight in California).

22. Can Energy Division staff share the emissions assumptions it is using in SERVM for these purposes, in particular natural gas plant start-up fuel? If possible, please share the cold, warm, and hot start-up fuel for all NG plants in California.

SERVM uses confidential CAISO Master File unit-level data on fuel burn for cold, warm and hot starts (MMBtu/start). If LSEs have their own access to this confidential data, they may use it. SERVM currently has no assumptions for emissions factors for NOx and PM2.5, as this will be a post-processing step on the hourly fuel burn and start type that is reported from SERVM. SERVM may rely on RESOLVE DAC analysis assumptions for emissions factors (NOx lb/MWh and PM2.5 lb/MMBtu, by resource class).

Additional Guidance

23. Please clarify and summarize the different load forecast and resource reporting requirements for different "sizes" of ESPs.

ESP "size"	Plan Type	Load Forecast	Resource Reporting
ESPs above the 700 GWh annual energy threshold for IRP	Standard	Use the ESP's IEPR Confidential Form 7.1, extended annually to 2030	Use the data templates provided by CPUC staff
ESPs below the 700 GWh annual energy threshold for IRP, but above the 200 MW peak load threshold for filing Form S-1 with the CEC	Type 1 Alternative	Use the ESP's IEPR Confidential Form 7.1, extended annually to 2030	Use CEC Form S-1, and S-2 (or EIA forms identified in D.18-02-018), extended to 2030
ESPs below the 700 GWh annual energy threshold for IRP, and below the 200 MW peak load threshold for filing Form S-1 with the CEC	Type 1 Alternative	Use the ESP's most recent year-ahead load forecast filing in RA, extended annually to 2030	

Note that the CEC Forms S-1 and S-2 contain both load and resource fields. The load fields should be consistent with corresponding load data reported in the LSE's IEPR Confidential Form 7.1 or most recent year-ahead RA load forecast, extended to 2030.

24. Does staff have any additional guidance on how to approach the requirement to strengthen the diversity, sustainability, and resilience of transmission and distribution systems and local communities? Or on how to enhance distribution system and demand side energy management?

The IRP Decision does not specify how this requirement is to be met and thus leaves it to the LSEs to determine the best approach.

25. Are LSEs required to conduct system modeling or use a particular modeling approach in preparing their IRPs?

LSEs are not required to conduct system modeling. However, LSEs who do conduct modeling for their Conforming Portfolios are required to align with the 2017 IEPR as closely as possible (including aligning fuel prices) and they should rely on Reference System Plan inputs and assumptions for all other data (e.g., baseline generating fleet, candidate resource cost assumptions, financial assumptions, etc.).

26. What level of confidentiality should ESPs assume for their IRP submittals?

Each LSE will have the burden to demonstrate what should be kept confidential in its filing. Please refer to GO-66D and D.06-06-066.

ATTACHMENT B

Guide to Production Cost Modeling in the Integrated Resource Plan Proceeding

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I. Introduction

This document describes guidelines for production cost modeling in the Commission's Integrated Resource Plan (IRP) rulemaking (R.16-02-007), as well as a process for calibrating and vetting production cost modeling using the Reference System Plan and subsequently applying the calibrated and vetted production cost modeling to evaluate the Preferred System Plan being considered in IRP. This document describes a potentially durable modeling process that could be replicated in future IRP cycles, as well as some workarounds to make the process fit within the schedule of this first IRP cycle.

Production cost modeling may be employed by LSEs to inform development of their respective IRP filings (LSE Plans). LSEs should adhere to the production cost modeling guidelines specified in this document[1] to the extent possible and be consistent with the baseline assumptions in the "Unified RA/IRP Inputs and Assumptions" staff deliverable as described later in this document.

Production cost modeling will also be conducted by Commission staff to evaluate the Preferred System Plan. Parties to the IRP proceeding may wish to also conduct their own modeling to evaluate the Preferred System Plan. Production cost modeling for the purpose of evaluating the Preferred System Plan must undergo the calibrating and vetting process described in this document. The goal of calibrating and vetting is to ensure modeling conducted by different parties produces comparable results and that differences are understood. The Reference System Plan will be used as the basis for calibrating and vetting modeling. Completing the calibration and vetting work up front using the Reference System Plan enables subsequent modeling on the Preferred System Plan to focus more on evaluating the Preferred System Plan, rather than validating models or characterizing differences between models.

II. Production Cost Modeling Calibration and Vetting

This section describes a process for calibrating and vetting production cost modeling in preparation for relying on such modeling to evaluate the Preferred System Plan. The process will be led by Commission

[1] The calibration and vetting process described in this document may ultimately result in revisions to the production cost modeling guidelines. Nevertheless, LSEs who will use production cost modeling to develop their respective LSE Plans should use the guidelines in this document since the work to develop an LSE Plan occurs in parallel to the calibration and vetting process. Any guideline revisions at the completion of the calibration and vetting process would apply to the subsequent evaluation of the Preferred System Plan, which is the aggregation of LSE Plans.

staff via the Modeling Advisory Group,[2] a forum conducive to collaborative work between multiple parties and staff. The process will include an opportunity for parties to formally comment on the modeling work on the IRP proceeding record, and conclude with the Commission providing revised guidance to standardize modeling across multiple parties in preparation for modeling to evaluate the Preferred System Plan. The following table summarizes the timeline of this process.

Item	Date	Activity or Milestone
(1)	December 2017 – February 2018	Staff calibrate RESOLVE and SERVM model input data with Reference System Plan and 2017 IEPR demand forecast
(2)	Mid-February 2018	Staff posts SERVM model input data and documentation
(3)	February – April 2018	Staff hosts monthly Modeling Advisory Group meetings
(4)	February – May 2018	Staff and modeling parties conduct modeling based on (2)
(5)	Early May 2018	Staff and modeling parties share results and revise as needed
(6)	Mid May 2018	Parties formally comment
(7)	June 2018	Commission, via ALJ ruling, provides revised guidance, if needed

Commission staff will use the SERVM[3] production cost model to measure operational performance and verify satisfaction of the Planning Reserve Margin[4] (PRM) requirement. This is the same model as used in the Resource Adequacy proceeding to calculate Effective Load Carrying Capability (ELCC).[5] Other parties who wish to evaluate the Preferred System Plan with their own production cost modeling should participate in the Modeling Advisory Group calibration and vetting process introduced above. Parties

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[2] Modeling Advisory Group (MAG) notices are emailed to the proceeding service list – there is no separate list. Previous meetings and materials are posted here: http://www.cpuc.ca.gov/General.aspx?id=6442453968.

[3] Strategic Energy Risk Valuation Model – developed by and commercially licensed through Astrape Consulting.

[4] Refers to the system Resource Adequacy requirement based on each LSE's peak demand forecast plus a 15% planning reserve margin. See: http://www.cpuc.ca.gov/General.aspx?id=6307.

[5] The Resource Adequacy proceeding adopted ELCC values in D.17-06-027. The record of this proceeding includes proposals providing relevant background information on modeling and ELCC studies.

may use a production cost modeling tool of their choosing, but are expected to use the guidance within this document, use the input data and documentation posted by staff in early February 2018, provide modeling results in early-April 2018, and collaborate with staff and other parties to align modeling to the extent possible. The items listed in the table above are described below in further detail.

(1) Staff calibrate RESOLVE and SERVM model input data with Reference System Plan and 2017 IEPR demand forecast

The purpose of this step is to develop a production cost modeling input dataset consistent with both the 2017 IEPR demand forecast and the RESOLVE model's 42 MMT core policy case (which is the chosen Reference System Plan portfolio). Commission staff will develop this dataset as follows:

a. Update the RESOLVE model with the 2017 IEPR demand forecast and associated load modifier components and rerun the 42 MMT core policy case.
b. Build a SERVM model input dataset from this 2017 IEPR-updated 42 MMT core policy case.

Having a 2017 IEPR updated production cost modeling dataset facilitates subsequent evaluation of and consistency with the Preferred System Plan which would have been aggregated from individual LSE Plans that also used the 2017 IEPR. Rerunning the RESOLVE model's 42 MMT core policy case with 2017 IEPR data allows RESOLVE operational results to be comparable to production cost models built with 2017 IEPR data and eliminates a need to do any production cost modeling with 2016 IEPR data.[6] The updated RESOLVE 42 MMT core policy case built with the 2017 IEPR is intended solely for the exercise of calibrating and vetting production cost models and does not replace the Commission adopted Reference System Plan and portfolio.

(2) Staff posts SERVM model input data and documentation

This will be a key deliverable from Commission staff to parties. It will illustrate a translation of RESOLVE model aggregate data into SERVM model unit-level data. It will include baseline unit-level detail for most of the Western Interconnect. If using production cost modeling for individual LSE Plan development, the LSE's modeling should be consistent with the baseline assumptions provided in this deliverable. If using production cost modeling to evaluate the Preferred System Plan, parties must use this deliverable as input for its modeling within the Modeling Advisory Group calibration and vetting process. The deliverable will contain two components:

a. 2018 Unified RA/IRP Inputs and Assumptions document – description of zonal and unit level input data for the SERVM model as used in the Resource Adequacy proceeding (study year 2019) and the IRP proceeding (study years 2022, 2026, and 2030). This

[6] The original RESOLVE 42 MMT core policy case was built with the 2016 IEPR demand forecast.

document will also include incremental modeling guidance necessary for network reliability models (e.g. "power flow" modeling).

b. Data workbooks – SERVM model input data in a generic spreadsheet format such that it can be imported into any production cost model, and other assumptions relevant to network reliability modeling such as resource locations by transmission busbar.

This deliverable is intended to replace the function of the traditional "Assumptions and Scenarios" document that has been annually created to inform the Commission's Long Term Procurement Plan proceeding and the CAISO's Transmission Planning Process (TPP).

(3) Staff hosts monthly Modeling Advisory Group meetings

Commission staff expects to hold monthly (or as needed) Modeling Advisory Group meetings to facilitate the calibration and vetting process. The meeting format may be webinar, teleconference, or in-person. Staff and parties should provide updates on modeling progress and discuss any modeling issues that arise.

(4) Staff and modeling parties conduct modeling based on (2)

Commission staff and parties develop and run their respective production cost models and report progress and issues in Modeling Advisory Group meetings. Further details on specific production cost modeling steps and modeling conventions are provided in the following sections of this document.

(5) Staff and modeling parties share results and revise as needed

Commission staff and parties share their respective production cost model results and collaboratively assess differences. Additional runs may be necessary to better align results. In terms of metrics for comparison between models, staff and other parties should follow the guidelines in the ALJ Ruling Directing Production Cost Modeling Requirements[7] issued in this proceeding on September 23, 2016, unless superseded by a specific guideline called out in this document or a recommendation agreed upon in the Modeling Advisory Group.

(6) Parties formally comment

The Commission will provide an opportunity for parties to formally comment on the production cost modeling calibration and vetting results on the IRP proceeding record.

(7) Commission provides revised guidance

The Commission will provide revised guidance in the form of an Administrative Law Judge ruling, considering the recommendations of the Modeling Advisory Group and party comments, to standardize production cost modeling across multiple parties to the greatest extent possible. Parties will be expected to follow this guidance when they conduct their own production cost modeling or related analysis to evaluate the Preferred System Plan.

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[7] http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442451199.

III. Modeling Scope and Conventions

The following describes the scope and conventions that Commission staff and parties are expected to use for both the production cost modeling calibration and vetting process and the subsequent evaluation of the Preferred System Plan. As indicated above, at the end of the calibration and vetting process the Commission may revise this guidance. Also as indicated above, LSEs using production cost modeling to inform their individual LSE Plan development should adhere to the modeling guidelines specified here to the extent possible.

A. Study years: 2022, 2026, and 2030.
B. SERVM will be run using hourly time-steps.
C. Hourly system load shapes will be built up from fundamental consumption load shapes and shapes for various load modifiers such as AAEE, TOU rates, and EV charging patterns. Transmission and distribution loss effects will be accounted for.
D. BTM PV will be explicitly modeled as generation, rather than embedded in the load forecast. Transmission and distribution loss effects will be accounted for.
E. Loss-of-load event definitions and counting conventions, and operating reserve targets[8] shall be consistent with those used in the Resource Adequacy proceeding's production cost modeling with SERVM for ELCC calculations. Multiple loss-of-load events occurring within one day shall count as one event for purposes of counting events towards a reliability target. The loss-of-load event occurs when regulation up/down (1.5% of hourly forecast load) or spinning reserves (3.0% of hourly forecast load) cannot be maintained.
F. Average portfolio ELCC values will be calculated for each month of the study year, consistent with the monthly Resource Adequacy program.
G. The loss-of-load-expectation (LOLE) reliability target range for calculating monthly average portfolio ELCC values shall be the range 0.02 to 0.03 LOLE for each month, same as was used in the Resource Adequacy proceeding's production cost modeling with SERVM.[9]
H. For ELCC calculations, the calibration of the system under study to the LOLE reliability target range may involve removing or adding generation.
    - Removal of generation to surface LOLE events in overbuilt systems shall be according to the following order:[10] Conventional thermal generators that have announced their

[8] As a percent of hourly forecast load, regulation up/down is 1.5% each, load following up is 2.5%, load following down is 1.5%, spinning reserves is 3.0%, non-spinning reserves is 3.0%.

[9] Specifically, the monthly LOLE target was created by first taking the industry standard 0.1 LOLE annual target and assuming that most of those events map to the four peak months of June through September, or one third of the year. Assuming a similar target reliability for the rest of the year would mean that total LOLE over the entire year should have a target of 0.1x3=0.3. Thus, monthly LOLE studies would have a monthly target LOLE of 0.3/12=0.025, i.e. a target range of 0.02 to 0.03.

retirement will be removed first. If LOLE remains below the target level, additional conventional thermal generation will be removed from CAISO areas ranked by age of the facility. The oldest one will be removed first, continuing in order of age. No hydro generation or renewable generation will be removed.

- Addition of generation to reduce LOLE events in underbuilt systems shall use perfect capacity as additions. Perfect capacity is a modeling proxy for generation with no operating constraints, e.g. always available, starts instantly, infinite ramp rate, no minimum operating level.
- Although the calibration step alters the system under study, this is a typical way of performing ELCC calculations and is not expected to significantly affect the ELCC measurement.

I. Average portfolio ELCC calculations will include all wind and utility-scale solar, both existing and new, but exclude all BTM PV. The calculation will treat all of these resources as if they were fully deliverable.

J. Reserve margin calculations will be performed for each month of a study year, relying on the average portfolio ELCC calculations as stated above. The conventions in the following table apply:

Component	Counting convention
Peak demand	IEPR 1-in-2 monthly peak consumption forecast adjusted for load-modifier impacts including BTM PV impact
Existing non-wind, non-solar	Use current monthly Net Qualifying Capacity values
New non-wind, non-solar	Use same conventions as the RESOLVE model
Wind and solar (excluding BTM PV), existing and new	Monthly average portfolio ELCC of these resources combined. Discount this value by the ratio of fully-deliverable capacity to total capacity.

K. Reporting of operational performance will include at least: LOLE probabilistic reliability level, emissions,[11] including estimating emissions from starts and stops, and NOx and PM2.5, RPS generation, curtailment patterns, production cost, import/export flows, and frequency of load following reserve shortages.

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[10] Note that the order specified here is simply a modeling convention picking one systematic way to remove capacity for the sole purpose of calibrating a system to a target reliability level in order to perform ELCC calculations. The choice and order of removing units does not imply the units are likely to retire or should retire.

[11] The scope of emissions reporting at the system level will be CAISO balancing area, California, and WECC-wide. CAISO area and California GHG emissions accounting should align with Energy Commission and CAISO production cost modeling practices to the extent possible.

IV. Modeling Steps

The following describes the steps that Commission staff will use for the production cost modeling calibration and vetting process. In the steps below, "study" or "studies" means production cost modeling runs. Parties participating in the calibration and vetting process with their own production cost model are expected to perform the "as found" study, but are not expected to perform any ELCC or reserve margin calculations. For the purposes of calibrating and vetting different production cost modeling efforts, comparing results from "as found" studies should be sufficient. Staff will be performing the ELCC and reserve margin calculation steps to exercise its own modeling process in preparation for evaluating the Preferred System Plan.

A. Conduct "as found" annual studies for years 2022, 2026, and 2030
    1. Evaluate operational performance, including the metrics as described above
    2. Quantify in MW the amount of effective capacity that should be added or removed to achieve an annual 0.1 LOLE target
    3. Benchmark key metrics from SERVM (or other production cost model) with equivalent metrics from the RESOLVE model's 2017 IEPR-updated 42 MMT core policy case
B. Calculate monthly average portfolio ELCC values for wind and utility solar
    1. For each month, calibrate the portfolio under study to the range of 0.02 to 0.03 LOLE for each month. Report the quantity of generation added or removed in MW.
    2. Calculate the monthly average portfolio ELCC of wind and utility solar together
C. Calculate the monthly reserve margin and verify satisfaction of the PRM system reliability requirement in each month of the study year (relying on the ELCC values in step B.)

Note that the production cost modeling exercises above do not include any marginal ELCC calculations. For this IRP cycle, the Commission directs LSEs to use marginal ELCCs derived from the RESOLVE model's Reference System Plan case and provided for reference in the table below. The Commission will consider providing production cost modeling-based marginal ELCCs in the subsequent IRP cycle.

ELCC Values	2018	2022	2026	2030
Marginal Solar ELCC (including BTM PV)	13%	2%	2%	2%
Marginal Wind ELCC	29%	31%	30%	30%

V. Preferred System Plan Production Cost Modeling

This section describes production cost modeling steps that Commission staff will take to evaluate the Preferred System Plan. Staff will use the SERVM production cost model to measure operational performance and verify satisfaction of the PRM requirement in each month of the study year, consistent with the current Resource Adequacy program. Staff will follow any new guidelines that resulted from

the calibration and vetting process described above. Parties wishing to conduct their own production cost modeling to evaluate the Preferred System Plan are expected to do the same.

VI. Modeling Steps

A. Aggregate the individual LSE Plans into the Preferred System Plan SERVM dataset
   1. The aggregation process must ensure that no resources are double-counted or under-counted, and that the aggregate of new resources selected by LSEs does not exceed the available resource potential. This step may require staff to make additional data requests to LSEs to resolve any issues.
   2. Staff posts the SERVM model input data representing the Preferred System Plan. This is also a key deliverable from staff to parties and serves as the common input for any party using production cost modeling to conduct their own evaluation of the Preferred System Plan, similar to the function and form of the SERVM model input data that was provided by staff at the beginning of the calibration and vetting process described above.

B. Conduct "as found" annual studies for years 2022, 2026, and 2030
   1. Evaluate operational performance, including the metrics as described above
   2. Quantify in MW the amount of effective capacity that should be added or removed to achieve an annual 0.1 LOLE target
   3. Compare with results of the "as found" studies based on the RESOLVE model's 2017 IEPR-updated 42 MMT core policy case used in the calibration and vetting process

C. Calculate monthly average portfolio ELCC values for wind and utility solar
   1. For each month, calibrate the portfolio under study to the range of 0.02 to 0.03 LOLE for each month. Report the quantity of generation added or removed in MW.
   2. Calculate the monthly average portfolio ELCC of wind and utility solar together

D. Calculate the monthly reserve margin and verify satisfaction of the PRM system reliability requirement in each month of the study year (relying on the ELCC values in step C.)

(End of Attachment B)

Additional templates are available at the following links:

- Baseline Resource Data Template (Excel Workbook)
- New Resource Data Template (Excel Workbook)
- Net Qualifying Capacity List (03-15-18 version of the list all LSEs are to use)
- IEPR Dollar Deflator Series