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PROPOSED DECISION

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4/25/2019 Item #51

Decision **PROPOSED DECISION OF ALJ FITCH** (Mailed 3/18/2019)

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Develop
an Electricity Integrated Resource
Planning Framework and to Coordinate
and Refine Long-Term Procurement
Planning Requirements.

Rulemaking 16-02-007

**DECISION ADOPTING PREFERRED SYSTEM PORTFOLIO AND PLAN
FOR 2017-2018 INTEGRATED RESOURCE PLAN CYCLE**

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**DECISION ADOPTING PREFERRED SYSTEM PORTFOLIO AND PLAN FOR
2017-2018 INTEGRATED RESOURCE PLAN CYCLE****Summary**

This decision evaluates the first round of individual integrated resource plan (IRP) filings of all of the Commission-jurisdictional load serving entities (LSEs). Twenty LSEs have IRPs that are approved or certified in this decision; nine are determined to be exempt from the requirement to file an IRP in 2018. An additional nineteen LSEs did not provide the required information about criteria pollutants associated with the resources serving their load. Those LSEs will have the opportunity to provide the required criteria pollutant information in a Tier 2 advice letter and have their IRPs approved or certified after the subsequent filing. One LSE did not file an IRP at all, and the Commission will develop a citation program to penalize such non-compliance in the future.

This decision also discusses the analysis conducted by Commission staff to evaluate the Hybrid Conforming Portfolio (HCP), which is an aggregation of the individual IRPs of all LSEs, reflecting the resource preferences of those LSEs. This HCP, after appropriate adjustments by Commission staff to render it feasible, was determined to be less reliable and result in more greenhouse gas emissions than the Commission's prior adopted Reference System Portfolio (RSP, from Decision (D.) 18-02-018), as adjusted to utilize the most recent assumptions from the California Energy Commission's 2017 Integrated Energy Policy Report (IEPR). In essence, the individual resource choices by the LSEs collectively did not result in a diverse and balanced portfolio of resources needed to ensure a sufficiently reliable or environmentally beneficial statewide electricity resource portfolio.

One critical reason for not accepting the HCP is the high degree of uncertainty about the actual status of resources identified by the individual LSEs in their IRPs – in many cases it was impossible to distinguish in the plans between a resource for which an LSE holds an executed contract and one that is purely aspirational. A second reason is the need to highlight the importance of a statewide IRP process that produces an optimized electric resource portfolio to enable California to achieve a decarbonized electric system that also functions reliably and at least cost to ratepayers overall, something that no individual LSE can achieve on its own.

Thus, this decision instead adopts a modified version of the RSP, utilizing 2017 IEPR assumptions, and instituting an assumption of a 40-year life for fossil-fueled generation. This portfolio will become the Preferred System Portfolio (PSP).

This decision further recommends to the California Independent System Operator (CAISO) that the PSP, as adopted, be utilized as both the reliability base case and the policy-driven base case for study in its 2019-20 Transmission Planning Process. This decision also recommends that the CAISO study two policy-driven sensitivity cases designed to test the transmission buildout needed for two distinct portfolios: one portfolio with the majority of renewable development in-state and the other portfolio with a much larger amount of imported renewables, primarily wind from Wyoming and New Mexico. Through the study of these two cases, we hope to learn more about the transmission buildout and cost implications of those two distinct portfolio choices.

In addition, this decision determines that realization of the PSP by 2030 will require concrete procurement of specific resources by many LSEs, with a

heavy focus on procurement by community choice aggregators to serve their expanding load. In addition, the decision finds that additional attention is warranted for the near- and medium-term reliability planning aspects of the IRP process. Both of these reasons lead us to initiate a “procurement track” of this proceeding to explore options for facilitating procurement, beyond that already planned or being undertaken by LSEs individually, of some existing and some new types of resources that are determined to be necessary for maintaining system reliability and/or to facilitate renewable integration.

Finally, this decision addresses a 2018 petition for modification of D.18-02-018 related to replacement energy for the Diablo Canyon Nuclear Power Plant and requires that each LSE serving load in the service area of Pacific Gas and Electric Company include in its next IRP filing a section explicitly addressing the need for replacement energy for Diablo Canyon with similar characteristics.

This proceeding remains open to continue the planning process for the 2019-2020 IRP cycle.

1. Procedural Background

The sections below detail the procedural background on the topics that will be addressed in this decision. Other topics have received comment in a similar timeframe and relate more to the development of the next cycle of integrated resource planning (IRP) in 2019-2020, and therefore will be handled in a later decision. This decision relates to the adoption of a Preferred System Portfolio (PSP) to close out the first, 2017-2018 IRP cycle.

1.1. Individual Integrated Resource Plan Filings

This portion of this proceeding began with the filing of individual IRPs by load serving entities (LSEs) on or about August 1, 2018, as directed by the

Commission in Decision (D.) 18-02-018. The entities filing individual IRPs, or notices of exempt status, were as follows:

Investor-Owned Utilities (IOUs)

- Bear Valley Electric Service (Bear Valley)
- Liberty Utilities (CalPeco Electric) (Liberty Utilities)
- Pacific Gas and Electric Company (PG&E)
- PacifiCorp
- San Diego Gas & Electric Company (SDG&E)
- Southern California Edison Company (SCE), with an update submitted October 22, 2018

Electric Service Providers (ESPs)

- 3 Phases Renewables (3 Phases)
- Agera Energy (Agera)
- American PowerNet Management, LP, refiled on March 15, 2019 but originally provided on August 1, 2018
- Calpine Energy Solutions, LLC (Calpine Solutions)
- Calpine PowerAmerica CA, LLC (Calpine PowerAmerica)
- Constellation NewEnergy, Inc. (Constellation)
- Direct Energy Business, LLC (Direct Energy)
- EDF Industrial Power Services (EDF Industrial)
- EnergyCal USA, LLC (dba YEP Energy)
- Gexa Energy California, LLC (Gexa)
- Just Energy Solutions, Inc. (Just Energy)
- Liberty Power Delaware, LLC (Liberty Power)
- Liberty Power Holdings (Liberty Holdings)
- Pilot Power Group, Inc. (Pilot Power)

- Praxair Plainfield (Praxair)
- Regents of the University of California (UC Regents)
- Shell Energy North America (Shell)
- Tiger Natural Gas, Inc. (Tiger)

Community Choice Aggregators (CCAs)

- Apple Valley Choice Energy (AVCE)
- CleanPower San Francisco (CleanPowerSF)
- Clean Power Alliance of Southern California (CPA), with resource templates updated on September 20, 2018 and October 26, 2018
- Desert Community Energy (Desert)
- East Bay Community Energy (EBCE)
- King City Community Power (KCCP)
- Lancaster Choice Energy (Lancaster)
- Marin Clean Energy (MCE), with resource templates updated on September 25, 2018
- Monterey Bay Clean Power Authority (Monterey Bay)
- Peninsula Clean Energy Authority (PCE)
- Pico Rivera Innovative Municipal Energy (PRIME)
- Pioneer Community Energy (Pioneer)
- Rancho Mirage Energy Authority (Rancho Mirage)
- Redwood Coast Energy Authority (Redwood Coast)
- San Jacinto Power (San Jacinto)
- San Jose Clean Energy (SJCE)
- Silicon Valley Clean Energy Authority (SVCEA)
- Solana Energy Alliance (Solana)

- Sonoma Clean Power Authority (SCPA), with resource templates updated September 19, 2018
- Valley Clean Energy Alliance (VCE)

Electric Cooperatives

- Anza Electric Cooperative (Anza), re-filed on March 14, 2019, but originally provided on August 1, 2018
- Plumas Sierra Cooperative (Plumas Sierra), re-filed on March 12, 2019, but originally provided on August 1, 2018
- Surprise Valley Electric cooperative (Surprise Valley), re-filed on March 12, 2019, but originally provided on August 1, 2018
- Valley Electric Association, Inc. (VEA).

One entity required to file an IRP did not provide it: Commercial Energy of California (an ESP).

Separately, on or before August 20, 2018, the following entities filed motions to file confidential versions of their IRPs under seal: 3 Phases; Agera; AVCE; Calpine Solutions; Calpine PowerAmerica; CleanPowerSF; Constellation; Direct Energy; EBCE; EDF Industrial; Just Energy; Lancaster; Liberty Utilities; Monterey Bay; PCE; PG&E; PRIME; Pilot Power; Pioneer; Rancho Mirage; Redwood Coast; San Jacinto; SCE; SCPA; Solana; SVCEA; Tiger; and UC Regents.

On August 30, 2018, PG&E and Protect Our Communities Foundation (POC) filed responses to the motions to file under seal. On September 10, 2018, replies to the PG&E and POC responses were filed by: PRIME, San Jacinto, Pioneer, Lancaster, AVCE, Redwood Coast, SVCEA, Rancho Mirage, Monterey Bay, SCPA, and Solano, jointly; Shell; Direct Energy, Calpine Solutions, and Constellation, jointly; PG&E; Tiger, EDF Industrial, and 3 Phases, jointly; CleanPowerSF; and PCE.

On September 12, 2018, initial comments on the individual IRPs were filed by the following parties: American Wind Energy Association – California Caucus (AWEA); California Community Choice Association (CalCCA); California Energy Storage Alliance (CESA); California Environmental Justice Association (CEJA) and Sierra Club, jointly; California Large Energy Consumers Association (CLECA); California Wind Energy Association (CalWEA); Center for Energy Efficiency and Renewable Technologies (CEERT); Environmental Defense Fund (EDF); Green Power Institute (GPI); GridLiance West (GridLiance); L. Jan Reid (Reid); Large Scale Solar Association (LSA); MCE; Natural Resources Defense Council (NRDC); PG&E; POC; Powerex Corp. (Powerex); Public Advocates Office of the California Public Utilities Commission (Cal Advocates);¹ Public Generating Pool (PGP); SCE; SDG&E; Shell; Southwestern Power Group (SWPG); The Utility Reform Network (TURN); Union of Concerned Scientists (UCS); and Women’s Energy Matters (WEM).

Cal Advocates also filed a concurrent motion on September 12, 2018 to file its initial comments under seal. That motion is granted by this decision.

Reply comments on the individual IRP filings were filed on September 26, 2018 by the following parties: Alliance for Retail Energy Markets (AReM); Bonneville Power Administration (BPA); CalCCA; California Association of Small and Multijurisdictional Utilities; Calpine Corporation; CEJA and Sierra Club, jointly; EDF; GPI; Grant County Washington Public Utilities District No. 1; GridLiance; Independent Energy Producers Association (IEP); Reid; PG&E; POC;

¹ Senate Bill 854 (Stats. 2018, Ch. 51) amended Pub. Util. Code § 309.5(a) so that the Office of Ratepayer Advocates (ORA) is now named the Public Advocates Office of the Public Utilities Commission. We will refer to this party as Cal Advocates, though many of their filings in this proceeding were filed under the name ORA.

Powerex; PGP; SCE; SDG&E; Shell; Solana; SCPA; Tacoma Power; TransAlta Energy Marketing U.S. ; and TURN.

On October 5, 2018, a joint Assigned Commissioner and Administrative Law Judge ruling was issued granting the motions to file under seal and seeking comments on future confidentiality treatment in the IRP process.

The issues related to future confidentiality treatment in the IRP process will be handled in an upcoming decision and are not addressed herein.

1.2. Production Cost Modeling of Aggregated IRPs

On September 24, 2018, an Administrative Law Judge (ALJ) ruling was issued seeking comment on production cost modeling conducted by Commission staff to analyze the reliability of the Reference System Portfolio (RSP) adopted in D.18-02-018, as updated by newer assumptions from the 2017 Integrated Energy Policy Report (IEPR) adopted by the California Energy Commission (CEC) in February 2018. This ruling set the stage for the production cost modeling to be conducted to support the upcoming recommendation for a PSP being considered in this decision.

On October 10, 2018, the following parties filed comments on the September 24, 2018 ALJ ruling about production cost modeling: AWEA; California Independent System Operator (CAISO); Cal Advocates; Calpine Corporation; CalWEA; CEERT; CEJA and Sierra Club, jointly; GPI; Gridliance; LSA; NRDC; PG&E; POC; SCE; SDG&E; TURN; UCS; and WEM.

On October 17, 2018, the following parties filed reply comments on production cost modeling: CAISO; CEJA and Sierra Club, jointly; GPI; GridLiance; LSA and Solar Energy Industries Association (SEIA), jointly; POC; and SCE.

On October 31, 2018, Commission staff hosted a workshop on production cost modeling, aggregation of LSE plans, and preliminary thoughts on portfolios to send to the CAISO for transmission planning.

On November 15, 2018, an ALJ ruling was issued finalizing the production cost modeling approach in response to comments received from parties on the September 24, 2018 ALJ ruling.

1.3. Preferred System Portfolio and Transmission Planning Process Recommendations

On January 7, 2019, Commission staff hosted a workshop to present the results of their production cost modeling, aggregation of LSE plans, and recommendations on the preferred system portfolio.

On January 11, 2019 an ALJ ruling was issued with recommendations about the resource portfolio to use for the PSP, as well as recommendations for portfolios to be transmitted to the CAISO for their annual Transmission Planning Process (TPP). This ruling also sought input about any actions the Commission should take as a result of the recommended resource portfolio.

Comments in response to this ALJ ruling were submitted on or before January 31, 2019 by the following parties: Advanced Energy Economy (AEE); AReM; AWEA; the Bay Area Municipal Transmission Group (BAMx); Cal Energy Development Company; Cal Advocates; CAISO; Calpine Corporation; CEERT; CEJA and Sierra Club, jointly; CESA; CLECA; DOW; EDF; GPI; Gridliance; Hell's Kitchen Geothermal; Imperial Irrigation District (IID); IEP; Joint CCAs, a joint filing of MCE, Sonoma Clean Power Authority (SCP), SVCE, Lancaster, PRIME, San Jacinto, Rancho Mirage, AVCE, PCE, and Monterey Bay; Reid; LSA; LS Power Development, LLC (LS Power); Nevada Hydro Company; NRDC; NRG Energy In. (NRG); Ormat Technologies (Ormat);

PG&E; POC; Powerex; San Diego County Water Authority (SDCWA); SCE (confidential version); SDG&E; SWPG; TransWest Express, LLC (TransWest); TURN; UCS; Wellhead Power Solutions, LLC (Wellhead); and Western Power Trading Forum (WPTF). SCE also submitted a concurrent motion to file a confidentiality version of its January 31, 2019 comments under seal. That motion is granted in this decision.

Reply comments were submitted on or before February 11, 2019 by the following parties: AReM; AWEA; BAMx; Cal Advocates; CAISO; CEERT; CEJA and Sierra Club, jointly; Coalition for the Optimization of Renewable Development (CORD); EDF; GPI; GridLiance; IID; NRDC; PG&E; POC; PGP; SCE; SDG&E; SWPG; TransWest; TURN; and Wellhead.

1.4. Near- and Medium-Term Reliability Issues

On November 16, 2018, a joint Assigned Commissioner and ALJ Ruling was issued seeking comment on policy issues related to reliability.

Comments in response to the joint Assigned Commissioner and ALJ Ruling were filed on or before December 20, 2018 by the following parties: AReM; CAISO; Cal Advocates; CalCCA; Calpine Corporation; CEERT; CESA; CLECA; Department of Market Monitoring (DMM) for the CAISO; Eagle Crest; EDF; First Solar; GPI; Hydrostor, Inc. (Hydrostor); IEP; LS Power; National Grid; PG&E; POC; Powerex; SDCWA; SCE; SDG&E; Shell; Sierra Club and CEJA, jointly; TURN; UCS; Unigen; Vote Solar; Wellhead; WEM; and WPTF.

Reply comments were filed on or before January 14, 2019 by the following parties: CAISO; Cal Advocates; CEERT; CEJA and Sierra Club, jointly; CESA; CLECA; Eagle Crest; EDF; IEP; PG&E; POC; SCE; Wellhead; and WPTF.

1.5. Liberty Utilities

On October 24, 2018, an ALJ ruling was issued seeking additional information from Liberty Utilities on their IRP filing. On November 9, 2018, Liberty Utilities responded to the ALJ ruling with additional information about their IRP requests. No party responded to Liberty Utilities.

2. Evaluation of Individual Integrated Resource Plans

This section includes a summary of our review and evaluation of each individual LSE's IRP. First, we describe the steps used to conduct the review. Then we include observations of common themes and issues across plans. Finally, we cover each LSE's plan and whether it satisfied the Commission's requirements for an IRP, leading to a finding of whether an LSE's plan should be approved or certified, or whether a refiling is required.

2.1. Review Approach

D.18-02-018 contained the process and requirements for all LSEs to file individual IRPs with the Commission. Prior to the filing deadline of August 1, 2018 for this first set of IRPs, Commission staff arranged periodic meetings with groups of LSEs by type (i.e., IOUs, CCAs, and ESPs) to provide them an opportunity to ask clarifying questions on LSE plan requirements. These meetings allowed Commission staff to make necessary adjustments to the IRP filing templates and to accommodate unique LSE circumstances, and generally to ensure that various LSE plans were being developed in a consistent manner leading up to the August 1, 2018 required filing date. Commission staff also created and maintained a "Filing Requirements Reference Guide,"² similar to a

² Available at: <http://cpuc.ca.gov/irp/filingtemplates/>

list of Frequently Asked Questions, which staff used to track LSE questions as they arose and providing clarifying responses. Commission staff posted this guide on the IRP website and notified parties when periodic updates were made.

Once the individual IRPs were filed on or about August 1, 2018, our review of the filings was divided into two parallel tracks:

- Track 1: review of the narrative LSE plans to assess whether each section met the requirements of D.18-02-018, including meeting the 2030 Greenhouse Gas (GHG) Benchmark, providing a Conforming Portfolio,³ and describing its treatment of disadvantaged communities (for example).
- Track 2: Review of LSE data submissions for aggregation, preparation for production cost modeling, and development of the PSP.

Commission staff first verified that all jurisdictional LSEs made a filing, and contacted any non-filing LSEs. Then staff verified that the correct type of plan (Standard or Alternative) was filed, and that the plans contained all the required materials. Staff contacted LSEs whose materials needed to be corrected or supplemented.

Commission staff also utilized a scorecard system to determine whether each LSE plan adequately satisfied the requirements established by the Commission in D.18-02-018. Given that this IRP cycle was the first, there were some limitations on how clearly defined in advance the standards of review for

³ A “conforming portfolio” was defined in D.18-02-018 as a portfolio demonstrating consistency with the reference system portfolio by 1) either using the GHG Planning Price or the LSE Specific 2030 GHG emissions benchmark and 2) using input assumptions matching those used in developing the reference system portfolio, with updating to reflect the latest IEPR assumptions. LSEs were also invited to submit “alternative” or “preferred” portfolios that utilized different assumptions, as specified by the LSE.

LSE plans could be, and thus the review was largely informed by the LSE plans themselves.

In general, the plans varied widely in quality, and this experience will be used to update and refine individual filing requirements for the next cycle. For most LSEs, certain sections of the plan either satisfied or exceeded the Commission's requirements, while other sections of the same plan failed to satisfy other requirements. In the LSE scorecards (discussed further below), we use the term "adequate" to reflect a satisfactory fulfillment of the individual requirement, "exemplary" to reflect surpassing requirements, and "not adequate" to reflect a failure to meet the requirement.

We also acknowledge that the instructions for completing the Standard LSE Plan were clearer in some areas than others. As a result, a more lenient assessment was applied to the following sections:

- Section 3.C: Deviations from Current Resource Plans. If an LSE claimed there were no deviations in the quantities and/or budgets for procurement between its LSE Plan and any currently filed or authorized resource plans, it was not expressly required that the LSE provide supporting evidence, and therefore few LSEs did so. Clearer direction will be provided to LSEs in the next IRP cycle, regarding the level of detail expected in this section, particularly as it relates to demonstrating, and not just describing, whether and how the LSE's plan deviates from currently filed plans. This may involve instructions for drawing comparisons between specific data filed in other proceedings and how that information comports with data filed by LSEs in IRPs.
- Section 3.D: Local Needs Analysis. The Commission allocates to each LSE the Local Capacity Technical Study results developed by the CAISO every year. Because this allocation is completed only on a year-ahead basis, we acknowledge that LSEs were unable to provide information on how they would meet local capacity needs projected out ten years. For this IRP cycle, we determined that each LSE who filed a plan provided an adequate

accounting of how it will meet the local capacity needs projected in the most recent CAISO Transmission Plan. In future IRP cycles, however, simply claiming compliance with resource adequacy requirements will likely be inadequate. We will further define the requirements on this topic in the next IRP cycle.

- Section 4.A: Proposed Activities. Commission staff will work to refine the filing requirements for this section of the plans for the next IRP cycle. It was clear that LSEs needed more guidance on how to connect their Preferred Portfolios with their proposed near-term implementation activities.

For other sections of the plans, the instructions were much clearer, and therefore we apply a higher standard of review. In particular, D.18-02-018 made it clear that all LSEs needed to provide information about local air pollutant minimization. Specifically, LSEs were required to provide annual criteria pollutant estimations associated with all of the emitting resources used to serve their load, including system power (*see* D.18-02-018, Section 6). LSEs were also required to include annual estimates of nitrous oxides (NO_x) and particular matter (PM_{2.5}). (*See* D.18-02-018, Section 6, Ordering Paragraph 7, and the Standard Plan template produced by Commission staff).

Once staff determined that all the required materials and information with respect to resource plans and commitments were submitted, they assembled the aggregated portfolio of all LSE plans, utilizing the conforming portfolios. More detail about this process is included in Section 3.1.1 below.

Commission staff then validated the integrity and consistency of the aggregated portfolio with physical system limits. Energy and resource adequacy contracts were tabulated by LSE, to ensure that contracts did not overlap and that physical units were not double-counted. This list was checked against the CAISO net qualifying capacity (NQC) list and the list of resources allocated via

the cost allocation mechanism. Staff assessed which physical units remained uncontracted. Staff then aggregated the LSE-specific data to preserve confidentiality of information.

A full dataset of the aggregated LSE portfolios, including the list of baseline and new physical units, but not contract information, was posted to the Commission's web site.⁴

Finally, Commission staff conducted production cost modeling of the aggregated LSE portfolio datasets. The Strategic Energy Risk Valuation Model (SERVM) was used to measure operational performance and system reliability. The November 15, 2018 ALJ ruling finalizing the production cost modeling approach and schedule contains more detailed information about the process used by Commission staff.

2.2. Common Themes and Issues Across LSE Plans

In our review of all of the LSE plans, several themes emerged that are discussed in this section.

2.2.1. Portfolio Development

The majority of LSEs submitted their Conforming Portfolio as their Preferred Portfolio, opting to use inputs and assumptions consistent with the Commission-adopted RSP and 2017 IEPR assumptions. Sixteen LSEs submitted an Alternative Portfolio as their Preferred Portfolio.

Several CCAs and ESPs filed Preferred Portfolios whose only significant difference was a change in load assumptions from the 2017 IEPR. In the case of

⁴ This data is available at <http://www.cpuc.ca.gov/General.aspx?id=6442459406>

CCAs, this was typically caused by changes that occurred after the filing deadline for the 2017 IEPR process. For ESPs, they often alter load shapes rather than load magnitude.

Several CCAs and ESPs also appeared to have used the Clean Net Short (CNS) calculator to design their resource portfolio, rather than first developing their portfolios and then using the CNS to check emissions results after the fact. It is important for LSEs to keep in mind that the CNS calculator was not designed to send portfolio investment signals, as it utilizes average rather than marginal hourly emissions factors to compute emissions associated with a resource portfolio, and therefore it is not an appropriate tool for LSE portfolio development decision making.

2.2.2. Actionability of Plans

As a general disclaimer, many LSEs acknowledged that the resources procured in future years may differ from what was indicated in their LSE plans as circumstances change and new information becomes available. The resource mix ultimately procured will depend on multiple variables including availability of supply, pricing of supply, ability of the LSE to acquire the resources, and other market or regulatory considerations.

Three CCAs (MCE, Monterey Bay, and SCP) cautioned against using their 2018 LSE plans in statewide planning in this IRP cycle, and instead recommended that the Commission wait until their subsequent “internal” or local IRPs are prepared and submitted. CPA also noted that its LSE plan does not supersede its internal procurement planning process.

Such statements are concerning, as the integrity of the IRP process, and the development of the PSP in particular, depends on the provision of accurate, up-to-date data and information by all LSEs. In particular, we expect all of the

LSEs to tailor their IRP development process to meet the Commission's requirements for implementing the statute, rather than expecting our process to conform to their local one. The Commission's portfolio aggregation and evaluation process, which relies on fulfillment of IRP filing requirements by LSEs, is the only process capable of assessing the overall needs of the CAISO grid and meeting the statewide GHG, reliability, and least-cost goals collectively. While LSEs may use their IRP process to meet local planning needs as well, the statewide planning function is the statutorily required process, and not subservient to the CCAs' other purposes. In the future, we will not only require all LSEs to file their IRPs according to the timetable and process required by the Commission, we will also require any other materials such as "internal" IRPs or other plans created by LSEs to be included in the submittal to the Commission. LSEs should not be conducting a separate and inconsistent planning process that is different in both timing and scope from the statewide one being conducted here.

Finally, many CCAs and ESPs considered certain sections of the LSE Plan template as inapplicable to them, stating that they do not consider the Commission to have the authority to dictate what specific actions they must take. This is best exemplified in responses to the "Cost and Rate Analysis" section of the template. Some CCAs stated that their rates are approved by their local governing boards and not set or overseen by the Commission, and that their governing board is the entity that determines whether their resource portfolio achieves environmental, reliability, and other benefits in a cost-effective manner.

While we agree that the Commission does not approve CCA or ESP rates, the Commission and the Legislature are concerned about overall cost to consumers. Section 454.52(D) of the Public Utilities Code requires that the

Commission ensure that each LSE minimizes “impacts on ratepayers’ bills.”

Without cost and rate information submitted in individual IRPs, the Commission has no basis on which to make any determination about compliance with this statutory requirement. While not providing this information in this round of IRP filings is not considered grounds for rejection of an individual IRP, in the next round it will be.

We intend to develop more detailed filing requirements in this area in time for the next IRP filings. In the meantime, Commission staff will pilot test the acquisition of this information beginning later this year with a data request that will be issued to all LSEs to provide additional/updated information by August 16, 2019. This is discussed in more detail in Section 3 of this decision below.

2.2.3. Use of the CNS Calculator

None of the LSEs used the GHG Planning Price adopted in D.18-02-018 in developing their plans. All LSEs opted to use the Commission-assigned LSE-specific 2030 GHG Benchmark, along with the CNS Calculator, to estimate the GHG emissions of their portfolios.

Seven LSEs⁵ used a conforming load forecast in the CNS calculator that was adjusted downward by a range of approximately 1-3%, without explanation, for the years 2018, 2022, and 2026. Nevertheless, in each instance the LSE met its 2030 GHG Benchmark.

About half of the LSEs filing Alternative Plans either used the CNS calculator incorrectly or did not use it at all to demonstrate achievement of their

⁵ AVCE, CPA, EBCE, Lancaster, SDG&E, SJCE, and Solana.

2030 GHG Benchmark. In all but one of these cases, the GHG Benchmarks were either calculated incorrectly or not calculated at all.

2.2.4. Criteria Pollutant and Disadvantaged Community Requirements

All LSEs filing Standard Plans identified whether they served disadvantaged communities. About half of the LSE plans (16 CCAs and 3 ESPs) did not meet the criteria pollutant reporting requirements. Often, these LSEs made no mention of the requirement or suggested that the requirement did not apply to them because they incorrectly interpreted the requirement as applicable only if they had conventional generators operating within their geographic territory. LSEs that were marked in the individual assessments in the section below as “not adequate” for this requirement are being asked to resubmit this portion of their plans.

Of the 19 LSEs that did not meet the criteria pollutant reporting requirements, about half made some type of criteria pollutant showing but did not provide projected emissions estimates as required by D.18-02-018. Specifically, these LSEs did not provide emissions estimates of NO_x and PM_{2.5}.

2.3. Overview of Disposition of Individual Plans

Table 1 below summarizes the disposition of the individual IRPs filed by all LSEs. In the case of ESPs and IOUs, their IRPs are either “approved” or “not yet approved” pending the refiling of the IRPs with the missing criteria pollutant information via Tier 2 Advice Letter as discussed in Section 2.3.1 below. In the case of CCAs, their IRPs are either “certified” or “not yet certified,” also pending refiling of the IRPs with the missing criteria pollutant information via Advice Letter. Also included are those LSEs whose filings are approved as “exempt”

from the requirement to file an IRP, though those entities are still required to file information substantiating their eligibility for an exemption on each required IRP filing date in the future.

Table 1. Summary of Disposition of Individual LSE 2018 IRP Filings

LSE	LSE Type	Approved or Certified	Not Yet Approved or Certified
3 Phases Renewables	ESP	X	
Agera	ESP	X	
American PowerNet Management	ESP	X	
Anza Electric Cooperative	Coop	Exempt	
Apple Valley Choice Energy	CCA		X
Bear Valley Electric	IOU	X	
Calpine Energy Solutions	ESP	X	
Calpine PowerAmerica CA	ESP	X	
Clean Power Alliance of Southern California	CCA		X
CleanPower San Francisco	CCA		X
Commercial Energy of CA	ESP		Did not file
Constellation NewEnergy	ESP		X
Desert Community Energy	CCA	X	
Direct Energy Business	ESP	X	
East Bay Community Energy	CCA		X
EDF Industrial Power Services	ESP	X	
EnergyCal USA (YEP Energy)	ESP	Exempt	
Gexa Energy California	ESP	Exempt	
Just Energy Solutions	ESP	X	
King City Community Power	CCA		X
Lancaster Choice Energy	CCA		X
Liberty Power Delaware	ESP	Exempt	
Liberty Power Holdings	ESP	Exempt	
Liberty Utilities (CalPeco Electric)	IOU	X	
Marin Clean Energy	CCA		X
Monterey Bay Clean Power Authority	CCA		X
Pacific Gas and Electric	IOU	X	
PacifiCorp	IOU	X	
Peninsula Clean Energy Authority	CCA	X	
Pico Rivera Innovative Municipal Energy	CCA		X

LSE	LSE Type	Approved or Certified	Not Yet Approved or Certified
Pilot Power Group	ESP		X
Pioneer Community Energy	CCA		X
Plumas Sierra Cooperative	Coop	Exempt	
Praxair Plainfield	ESP	Exempt	
Rancho Mirage Energy Authority	CCA		X
Redwood Coast Energy Authority	CCA	X	
Regents of the University of California	ESP	X	
San Diego Gas & Electric	IOU	X	
San Jacinto Power	CCA		X
San Jose Clean Energy	CCA		X
Shell Energy	ESP		X
Silicon Valley Clean Energy Authority	CCA		X
Solana Energy Alliance	CCA	X	
Sonoma Clean Power Authority	CCA		X
Southern California Edison	IOU	X	
Surprise Valley Electric Cooperative	Coop	Exempt	
Tiger Natural Gas	ESP	X	
Valley Clean Energy Alliance	CCA		X
Valley Electric Association	Coop	Exempt	

2.3.1. Resubmission Process for 2018 IRPs

For those entities who have parts of their IRPs that are determined to be “not adequate,” their plans are not approved (in the case of IOUs and ESPs) or certified (in the case of CCAs) in this decision, as summarized in the table above.

In order to remedy these deficiencies, we will require that the LSE file a Tier 2 Advice Letter by no later than June 14, 2019, providing, at a minimum, an appendix or supplement to its IRP, with the missing or inadequate information from the August 2018 version. New data templates or other attachments are not required. The next section includes more detailed guidance to each LSE about the information it needs to improve in order to have its IRP approved or certified by Commission staff via the Advice Letter process.

In particular, all of the entities whose IRPs are not certified or approved herein failed to provide adequate information about criteria pollutant emissions associated with their portfolios or planned portfolios. D.18-02-018, specifically Section 6 and Ordering Paragraph 7, required provision of this numerical information on an annual basis. For this first set of IRPs, many LSEs who provided adequate response to these requirements only provided the information for the four study years (2018, 2022, 2026, and 2030). That level of information will be acceptable for this round, but in future IRPs, we will require the information annually. And to be clear, the criteria pollutant information must be numerical and provided in a table format, for both NO_x and PM_{2.5}, and the emissions must comport with or be proportional to the GHG-related emissions information otherwise provided by the LSE. If these criteria are met, Commission staff will approve or certify the refiled IRPs via the Advice Letter process.

2.4. Review of Individual LSE Plans

This section includes the scorecards for each LSE. Below the scorecard is a summary of the next steps required for that LSE, plus any guidance for plan development for the next IRP cycle.

2.4.1. Standard Plans

Apple Valley Choice Energy

Requirement	Assessment
Study Design	Apple Valley Choice Energy (AVCE) provided an adequate description of modeling tools and approach used to develop its portfolios.
Study Results: Preferred and Conforming Portfolios	AVCE provided a Conforming Portfolio and an Alternative (Preferred) Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an adequate explanation of the reasons for its

	preference, but it did not explain how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement. Its portfolios differ by load forecast but otherwise use the same planning assumptions. AVCE's Conforming Portfolio used an incorrect load forecast for the years 2018, 2022, and 2026, but the load forecast used for year 2030 was correct and met its assigned GHG Benchmark. AVCE did not explain why its load forecast for pre-2030 years deviated from its assigned forecast.
Study Results: Local Air Pollutant Minimization	AVCE stated that it minimizes localized air pollutants with early priority on disadvantaged communities but did not provide any quantitative evidence to back the claim. No attempt to provide best available estimates of emissions of nitrogen oxides and particulate matter was made. Identification of disadvantaged communities was adequate.
Study Results: Cost and Rate Analysis	AVCE provided an adequate description of its approach in considering cost and rate impacts on its customers.
Study Results: Deviations from Current Resource Plans	AVCE stated that its LSE plan does not deviate from any currently filed or authorized resource plans.
Action Plan: Proposed Activities	AVCE did not provide an explicit connection to its Preferred Portfolio findings, but its statements are consistent with its study results.
Action Plan: Barrier Analysis	AVCE provided an adequate description of the market, regulatory, financial, and other barriers associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	AVCE did not describe any direction sought from the Commission.
Lessons Learned	AVCE provided an adequate description of lessons learned.

Next Steps for AVCE

Action required in this IRP 2017-18 cycle: Provide best available estimates of emissions of nitrogen oxides and particulate matter associated with all emitting resources used to serve load, including system power. Refer to pages 19-22 of Desert Community Energy's IRP filing for an example of the type of information a CCA can provide to fulfill this specific filing requirement.

Guidance for LSE Plan development in the next IRP cycle:

- Use the correct assigned load forecast when developing the Conforming Portfolio.
- Draw clearer connections between proposed near-term activities and the portfolio study result.

Calpine Energy Solutions, LLC

Requirement	Assessment
Study Design	Calpine Energy Solutions, LLC (Calpine Solutions) provided an adequate description of modeling tools and approach used to develop its portfolios.
Study Results: Preferred and Conforming Portfolios	Calpine Solutions provided a Conforming Portfolio and an Alternative (Preferred) Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an adequate explanation of the reasons for its preference; however, it did not explain how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement. Calpine Solutions calculated its LSE-specific GHG Benchmark using incorrect direct access 2030 load estimates for each IOU service territory, resulting in a benchmark that is approximately 7% lower (more stringent) than its actual benchmark. Nevertheless, both its Conforming and Preferred Portfolios achieve the 2030 GHG Benchmark.
Study Results: Local Air Pollutant Minimization	Calpine Solutions provided exemplary estimates of emissions of nitrogen oxides and particulate matter. Identification of disadvantaged communities and emissions impact on them was adequate.
Study Results: Cost and Rate Analysis	Calpine Solutions provided an adequate description of its approach in considering cost and rate impacts on its customers.
Study Results: Deviations from Current Resource Plans	Calpine Solutions marked this section as not applicable, stating that it has not filed any other resource plans.
Action Plan: Proposed	Calpine Solutions provided an adequate description of its proposed near-term activities to implement its LSE Plan

Activities	along with links to its Preferred Portfolio study results.
Action Plan: Barrier Analysis	Calpine Solutions did not describe any market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	Calpine Solutions stated that it is not seeking any Commission direction at this time.
Lessons Learned	Calpine Solutions provided an adequate description of lessons learned.

Next Steps for Calpine Solutions

Action required in this IRP 2017-18 cycle: None at this time.

Guidance for LSE Plan development in the next IRP cycle:

- Use the correct methodology and values when calculating the LSE-specific 2030 GHG Benchmark.
- Complete the Barrier Analysis section (or its equivalent) so that the Commission may evaluate the LSE's consideration of market, regulatory, financial, and other barriers or risks associated with the LSE's Preferred Portfolio.

Calpine PowerAmerica-CA, LLC

Requirement	Assessment
Study Design	Calpine PowerAmerica provided an adequate description of modeling tools and approach used to develop its portfolios.
Study Results: Preferred and Conforming Portfolios	Calpine PowerAmerica provided a Conforming Portfolio and an Alternative (Preferred) Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an adequate explanation of the reasons for its preference; however, it did not explain how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement. Calpine PowerAmerica calculated its LSE-specific GHG Benchmark using incorrect direct access 2030 load estimates for each IOU service territory, resulting in a benchmark that

	is approximately 7% lower (more stringent) than its actual benchmark. Nevertheless, both its Conforming and Preferred Portfolios achieve the 2030 GHG Benchmark.
Study Results: Local Air Pollutant Minimization	Calpine PowerAmerica provided exemplary estimates of emissions of nitrogen oxides and particulate matter. Identification of disadvantaged communities and emissions impact on them was adequate.
Study Results: Cost and Rate Analysis	Calpine PowerAmerica provided an adequate description of its approach in considering cost and rate impacts on its customers.
Study Results: Deviations from Current Resource Plans	Calpine PowerAmerica marked this section as not applicable, stating that it has not filed any other resource plans.
Action Plan: Proposed Activities	Calpine PowerAmerica provided an adequate description of its proposed near-term activities to implement its LSE Plan along with links to its Preferred Portfolio findings.
Action Plan: Barrier Analysis	Calpine PowerAmerica did not describe any market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	Calpine PowerAmerica stated that it is not seeking any Commission direction at this time.
Lessons Learned	Calpine PowerAmerica provided an adequate description of lessons learned.

Next Steps for Calpine PowerAmerica

Action required in this IRP 2017-18 cycle: None at this time.

Guidance for LSE Plan development in the next IRP cycle:

- Use the correct methodology and values when calculating the LSE-specific 2030 GHG Benchmark.
- Complete the Barrier Analysis section (or its equivalent) so that the Commission may evaluate the LSE's consideration of market, regulatory, financial, and other barriers or risks associated with the LSE's Preferred Portfolio.

Clean Power Alliance of Southern California

Requirement	Assessment
Study Design	Clean Power Alliance of Southern California (CPA) provided an adequate description of modeling tools and approach used to develop its portfolio.
Study Results: Preferred and Conforming Portfolios	CPA provided a Conforming Portfolio as its Preferred Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an adequate explanation of the reasons for its preference, but it did not explain how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement. CPA did not submit an optional Alternative Portfolio. CPA included a custom GHG-free generating resource in its CNS Calculator, but it did not identify the resource type, nor did it provide supporting evidence or rationale for including this resource during the specified hours at these volumes. CPA's Conforming Portfolio used an incorrect load forecast for the years 2022, 2026, and 2030, but the correct 2030 load forecast would meet its assigned GHG Benchmark. Though the variation was less than 1% in each year, CPA did not explain why its load forecast deviated from its assigned forecast.
Study Results: Local Air Pollutant Minimization	CPA made no attempt to provide best available estimates of emissions of nitrogen oxides and particulate matter. Identification of disadvantaged communities was adequate. CPA provided the number of conventional power plants in its territory but did not provide specific facility names or their emissions.
Study Results: Cost and Rate Analysis	CPA provided an adequate description of its approach in considering cost and rate impacts on its customers.
Study Results: Deviations from Current Resource Plans	CPA marked this section as not applicable, stating that it has not filed any other resource plans.
Action Plan: Proposed Activities	CPA provided an adequate description of its proposed near-term activities to implement its LSE Plan along with links to its Preferred Portfolio study findings. However,

	CPA provided only a vague description of outreach or plans to seek input from disadvantaged communities.
Action Plan: Barrier Analysis	CPA provided an adequate description of the market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	CPA proposed the following: - Requests that SCE provide more than 2 years of historical load data to CCAs and generally improve its data access. - Requests revision of D.06-06-066 to include the same confidentiality treatment for CCA customers as provided for IOUs and ESPs.
Lessons Learned	CPA provided an adequate description of lessons learned.

Next Steps for CPA

Action required in this IRP 2017-18 cycle: Provide best available estimates of emissions of nitrogen oxides and particulate matter associated with all emitting resources used to serve load, including system power. Refer to pages 19-22 of Desert Community Energy's IRP filing for an example of the type of information a CCA can provide to fulfill this specific filing requirement.

Guidance for LSE Plan development in the next IRP cycle:

- Use the correct assigned load forecast when developing the Conforming Portfolio.
- When entering a custom GHG-free generating resource in the CNS Calculator, identify the specific resource type and provide supporting evidence or rationale for including this resource during the specified hours at these volumes.

CleanPowerSF

Requirement	Assessment
Study Design	CleanPowerSF provided an adequate description of modeling tools and approach used to develop its portfolios.
Study Results: Preferred and Conforming Portfolios	CleanPowerSF provided a Conforming Portfolio as its Preferred Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an adequate explanation of the reasons for its preference and how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement. CleanPowerSF did not submit an optional Alternative Portfolio.
Study Results: Local Air Pollutant Minimization	CleanPowerSF made no attempt to provide best available estimates of emissions of nitrogen oxides and particulate matter. Identification of disadvantaged communities needs clarification.
Study Results: Cost and Rate Analysis	CleanPowerSF provided an adequate description of its approach in considering cost and rate impacts on its customers.
Study Results: Deviations from Current Resource Plans	CleanPowerSF provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans.
Action Plan: Proposed Activities	CleanPowerSF did not provide an adequate description of its proposed near-term activities to implement its LSE Plan, as it did not provide clear links to its Preferred Portfolio findings.
Action Plan: Barrier Analysis	CleanPowerSF provided an adequate description of the market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	CleanPowerSF requested that Commission do the following: • Establish a schedule providing sufficient time to accommodate the planning and approval processes of all LSEs • Correct limitations of RESOLVE model to

	adequately plan at LSE level • Increase the transparency of the RESOLVE model • Correct the assumption that RA capacity procurement is not included in RESOLVE CleanPowerSF also stated that the use of the CNS hourly GHG accounting method is inconsistent with the California Air Resources Board's (CARB's) annual GHG targets, and that further disaggregation of GHG Emissions Benchmarks may be necessary to ensure an appropriate contribution of different resource types toward statewide GHG reduction goals.
Lessons Learned	CleanPowerSF provided an adequate description of lessons learned.

Next Steps for CleanPowerSF

Action required in this IRP 2017-18 cycle:

- Provide best available estimates of emissions of nitrogen oxides and particulate matter associated with all emitting resources used to serve load, including system power. Refer to pages 19-22 of Desert Community Energy's IRP filing for an example of the type of information a CCA can provide to fulfill this specific filing requirement.
- Clarify what percentage of disadvantaged communities in CleanPowerSF's territory are not completely served by Hetch Hetchy Power.

Guidance for LSE Plan development in the next IRP cycle: Draw clearer connections between proposed near-term activities and the portfolio study results.

Constellation NewEnergy, Inc.

Requirement	Assessment
Study Design	Constellation NewEnergy, Inc. (Constellation) provided an adequate description of modeling tools and approach used to develop its portfolios.

Study Results: Preferred and Conforming Portfolios	Constellation provided a Conforming Portfolio and an Alternative (Preferred) Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an exemplary explanation of the reasons for its preference and how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement, supported by a clear showing of how its load forecast was derived and how its LSE-specific GHG benchmark was calculated. In its CNS Calculator submissions, Constellation zeroed out “Fraction of EV owners that can charge at work” without any explanation. The effect of zeroing out those values was to increase reported portfolio emissions across the planning horizon.
Study Results: Local Air Pollutant Minimization	Constellation stated that it minimizes localized air pollutants by prioritizing renewable energy but made no attempt to provide best available estimates of emissions of nitrogen oxides and particulate matter for the fossil fuel capacity it has under contract. Identification of disadvantaged communities was adequate.
Study Results: Cost and Rate Analysis	Constellation provided an adequate description of its approach in considering cost and rate impacts on its customers.
Study Results: Deviations from Current Resource Plans	Constellation provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans, stating that although its Conforming and Alternative Portfolios are not identical, they are each consistent with Constellation’s Renewables Portfolio Standard (RPS) Procurement Plan.
Action Plan: Proposed Activities	Constellation provided an adequate description of its proposed near-term activities to implement its LSE Plan along with links to its Preferred Portfolio study results.
Action Plan: Barrier Analysis	Constellation provided an adequate description of the market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.

Action Plan: Proposed Commission Direction	Constellation stated that it is not seeking any Commission direction at this time.
Lessons Learned	Constellation provided an adequate description of lessons learned.

Next Steps for Constellation

Action required in this IRP 2017-18 cycle: Provide best available estimates of emissions of nitrogen oxides and particulate matter associated with all emitting resources used to serve load, including system power. *See* page 16 of Calpine Energy Solutions’ plan for an example of the type of information an ESP can provide to fulfill this specific filing requirement.

Guidance for LSE Plan development in the next IRP cycle: When modifying default load modifier inputs in the CNS Calculator, provide supporting evidence or rationale for making those modifications.

Desert Community Energy

Requirement	Assessment
Study Design	Desert Community Energy (Desert) provided an adequate description of modeling tools and approach used to develop its portfolios.
Study Results: Preferred and Conforming Portfolios	Desert provided a Conforming Portfolio and an Alternative (Preferred) Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an adequate explanation of the reasons for its preference and how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement. Desert incorrectly assumed that its Conforming Portfolio must contain a proportional load-weighted share of the Reference System Portfolio adopted by the Commission. Although Desert’s Conforming Portfolio does not meet its GHG Benchmark, its Preferred Portfolio does.

Study Results: Local Air Pollutant Minimization	Desert provided an exemplary description of how its Preferred Portfolio minimizes localized air pollutants. Desert exceeded requirements for disadvantaged community identification by specifying low-income and tribal communities, which were not necessarily marked as disadvantaged communities by the ranking definition.
Study Results: Cost and Rate Analysis	Desert provided an exemplary description of its approach in considering cost and rate impacts on its customers, including information on its rate setting method and schedule, current rate, and planned offerings, along with links to more information.
Study Results: Deviations from Current Resource Plans	Desert provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans, stating that it has not filed any other sort of resource plan other than that described in its implementation plan, and that its Preferred Portfolio is consistent with its implementation plan.
Action Plan: Proposed Activities	Desert provided an adequate description of its proposed near-term activities to implement its LSE Plan along with links to its Preferred Portfolio findings.
Action Plan: Barrier Analysis	Desert provided an adequate description of the market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	Desert stated that it is not seeking any Commission direction at this time.
Lessons Learned	Desert provided an adequate description of lessons learned.

Next Steps for Desert

Action required in this IRP 2017-18 cycle: None at this time.

Guidance for LSE Plan development in the next IRP cycle: None at this time.

Direct Energy Business, LLC

Requirement	Assessment
Study Design	Direct Energy Business, LLC (Direct Energy) provided an adequate description of modeling tools and approach used to develop its portfolios.
Study Results: Preferred and Conforming Portfolios	Direct Energy provided a Conforming Portfolio and an Alternative (Preferred) Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an exemplary explanation of the reasons for its preference, with clear descriptions of what entries were changed in the CNS Calculator and why. The 2030 emissions associated with Direct Energy's Preferred Portfolio exceeds its GHG Benchmark by approximately 3%, which is acceptable for IRP planning purposes.
Study Results: Local Air Pollutant Minimization	Direct Energy provided adequate estimates of nitrogen oxides and particulate matter as well as an adequate description of how it plans to minimize localized air pollutants and other GHG emissions with early priority on disadvantaged communities. Identification of disadvantaged communities and emissions impact on them was adequate.
Study Results: Cost and Rate Analysis	Direct Energy provided an adequate description of its approach in considering cost and rate impacts on its customers
Study Results: Deviations from Current Resource Plans	Direct Energy provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans, stating that there are no deviations except for the load forecast submitted to the CEC in its IEPR 7.1 form.
Action Plan: Proposed Activities	Direct Energy provided an adequate description of its proposed near-term activities to implement its LSE Plan along with links to its Preferred Portfolio findings.
Action Plan: Barrier Analysis	Direct Energy provided an adequate description of the market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.

Action Plan: Proposed Commission Direction	Direct Energy stated that it is not seeking any Commission direction at this time.
Lessons Learned	Direct Energy provided an adequate description of lessons learned.

Next Steps for Direct Energy

Action required in this IRP 2017-18 cycle: None at this time.

Guidance for LSE Plan development in the next IRP cycle: None at this time.

East Bay Community Energy

Requirement	Assessment
Study Design	East Bay Community Energy (EBCE) provided an adequate description of modeling tools and approach used to develop its portfolio.
Study Results: Preferred and Conforming Portfolios	EBCE provided a Conforming Portfolio as its Preferred Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an adequate explanation of the reasons for its preference and how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement. EBCE did not submit an optional Alternative Portfolio. EBCE's Conforming Portfolio used an incorrect load forecast for each of the planning years (2018, 2022, 2026, and 2030). However, the deviation amounts to less than 1% and does not affect EBCE's achievement of its GHG Benchmark. EBCE did not explain why its load forecast deviated from its assigned forecast.
Study Results: Local Air Pollutant Minimization	EBCE made no attempt to provide best available estimates of emissions of nitrogen oxides and particulate matter. Identification of disadvantaged communities was adequate.
Study Results: Cost and Rate Analysis	EBCE provided an adequate description of its approach in considering cost and rate impacts on its customers.

Study Results: Deviations from Current Resource Plans	EBCE provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans, stating that there are no deviations.
Action Plan: Proposed Activities	EBCE provided an adequate description of its proposed near-term activities to implement its LSE Plan along with links to its Preferred Portfolio study results; however, more detail could have been included regarding the Oakland Clean Energy Initiative.
Action Plan: Barrier Analysis	EBCE did not provide a description of the market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	EBCE marked this this section as not applicable to EBCE.
Lessons Learned	EBCE provided an adequate description of lessons learned.

Next Steps for EBCE

Action required in this IRP 2017-18 cycle: Provide best available estimates of emissions of nitrogen oxides and particulate matter associated with all emitting resources used to serve load, including system power. Refer to pages 19-22 of Desert Community Energy's IRP filing for an example of the type of information a CCA can provide to fulfill this specific filing requirement.

Guidance for LSE Plan development in the next IRP cycle:

- Use the correct assigned load forecast when developing the Conforming Portfolio.
- Complete the Barrier Analysis section (or its equivalent) so that the Commission may evaluate the LSE's consideration of market, regulatory, financial, and other barriers or risks associated with the LSE's Preferred Portfolio.

Lancaster Choice Energy

Requirement	Assessment
Study Design	Lancaster Choice Energy (Lancaster) provided an adequate description of modeling tools and approach used to develop its portfolios.
Study Results: Preferred and Conforming Portfolios	Lancaster provided a Conforming Portfolio as its Preferred Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an adequate explanation of the reasons for its preference, but it did not explain how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement. Lancaster's Preferred Portfolio used an incorrect load forecast for the years 2018, 2022, and 2026, but the load forecast used for year 2030 was correct and met its assigned GHG Benchmark. Lancaster did not explain why its load forecast for pre-2030 years deviated from its assigned forecast.
Study Results: Local Air Pollutant Minimization	Lancaster stated that it minimizes localized air pollutants with early priority on disadvantaged communities but did not provide any quantitative evidence to back the claim. No attempt to provide best available estimates of emissions of nitrogen oxides and particulate matter was made. Identification of disadvantaged communities was adequate.
Study Results: Cost and Rate Analysis	Lancaster provided an adequate description of its approach in considering cost and rate impacts on its customers.
Study Results: Deviations from Current Resource Plans	Lancaster provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans, stating that there are no deviations.
Action Plan: Proposed Activities	Lancaster did not provide an adequate description of its proposed near-term activities to implement its LSE Plan, as it did not provide clear links to its Preferred Portfolio findings.
Action Plan: Barrier Analysis	Lancaster provided an adequate description of the market, regulatory, financial, and other barriers or risks associated with its Preferred Portfolio.

Action Plan: Proposed Commission Direction	Lancaster marked this this section as not applicable.
Lessons Learned	Lancaster provided an adequate description of lessons learned.

Next Steps for Lancaster

Action required in this IRP 2017-18 cycle: Provide best available estimates of emissions of nitrogen oxides and particulate matter associated with all emitting resources used to serve load, including system power. Refer to pages 19-22 of Desert Community Energy's IRP filing for an example of the type of information a CCA can provide to fulfill this specific filing requirement.

Guidance for LSE Plan development in the next IRP cycle:

- Use the correct assigned load forecast when developing the Conforming Portfolio.
- Draw clearer connections between proposed near-term activities and the portfolio study results.

Marin Clean Energy

Requirement	Assessment
Study Design	Marin Clean Energy (MCE) provided an adequate description of modeling tools used and a clear description of how its inputs and assumptions differ between its Conforming and Preferred portfolios.
Study Results: Preferred and Conforming Portfolios	MCE provided a Conforming Portfolio and an Alternative (Preferred) Portfolio showing both existing resources and new resources that it plans to invest in or contract with. Its portfolio deviations were clearly described, but its rationale did not include why the IEPR load shapes were deemed inadequate. Also, it did not explain how its Preferred Portfolio is consistent with each relevant statutory and

	administrative requirement. MCE included an asset-controlling supplier (ACS)⁶ resource as a custom GHG-free generating resource in its CNS Calculator for both portfolios, but it did not provide supporting evidence or rationale for including this resource during the specified hours at these volumes.
Study Results: Local Air Pollutant Minimization	MCE did not attempt to provide best available estimates of emissions of nitrogen oxides and particulate matter. Identification of disadvantaged communities was exemplary.
Study Results: Cost and Rate Analysis	MCE provided an adequate description of its approach in considering cost and rate impacts on its customers.
Study Results: Deviations from Current Resource Plans	MCE provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans, stating that there are no deviations.
Action Plan: Proposed Activities	MCE did not provide an adequate description of its proposed near-term activities to implement its LSE Plan, as it did not provide clear links to its Preferred Portfolio findings. MCE did not mention any outreach or plans to seek input from communities.
Action Plan: Barrier Analysis	MCE provided an adequate description of the market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	MCE marked this this section as not applicable.

⁶ An asset-controlling supplier (ACS) is a specific type of electric power entity approved and registered by the California Air Resources Board under the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (MRR). For each reporting year, CARB publishes emission factors for all approved ACSs pursuant to section 95111(b)(3). ACS emissions factors tend to range from 0.01 to 0.05 tCO₂e/MWh.

Next Steps for MCE

Action required in this IRP 2017-18 cycle: Provide best available estimates of emissions of nitrogen oxides and particulate matter associated with all emitting resources used to serve load, including system power. Refer to pages 19-22 of Desert Community Energy's IRP filing for an example of the type of information a CCA can provide to fulfill this specific filing requirement.

Guidance for LSE Plan development in the next IRP cycle:

- When entering a custom GHG-free generating resource in the CNS Calculator, provide supporting evidence or rationale for including this resource during the specified hours at these volumes.
- Draw clearer connections between proposed near-term activities and the portfolio study results.

Monterey Bay Community Power

Requirement	Assessment
Study Design	Monterey Bay Community Power (Monterey Bay) provided an adequate description of modeling tools and approach used to develop its portfolio.
Study Results: Preferred and Conforming Portfolios	Monterey Bay provided a Conforming Portfolio as its Preferred Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an adequate explanation of the reasons for its preference and how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement. Monterey Bay did not submit an optional Alternative Portfolio.
Study Results: Local Air Pollutant Minimization	Monterey Bay did not attempt to provide best available estimates of emissions of nitrogen oxides and particulate matter. Identification of disadvantaged communities was adequate.
Study Results: Cost and Rate Analysis	Monterey Bay provided an adequate description of its approach in considering cost and rate impacts on its customers.

Study Results: Deviations from Current Resource Plans	Monterey Bay provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans, stating that its RPS Plan load forecast is based on its own retail sales forecast, which differs from the forecast used for IRP.
Action Plan: Proposed Activities	Monterey Bay did not provide an adequate description of its proposed near-term activities to implement its LSE Plan, as it did not provide clear links to its Preferred Portfolio findings.
Action Plan: Barrier Analysis	Monterey Bay did not provide an adequate description of the market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	Monterey Bay marked this this section as not applicable.
Lessons Learned	Monterey Bay provided an adequate description of lessons learned.

Next Steps for Monterey Bay

Action required in this IRP 2017-18 cycle: Provide best available estimates of emissions of nitrogen oxides and particulate matter associated with all emitting resources used to serve load, including system power. Refer to pages 19-22 of Desert Community Energy's IRP filing for an example of the type of information a CCA can provide to fulfill this specific filing requirement.

Guidance for LSE Plan development in the next IRP cycle:

- Draw clearer connections between proposed near-term activities and the portfolio study results.
- Complete the Barrier Analysis section (or its equivalent) so that the Commission may evaluate the LSE's consideration of market, regulatory, financial, and other barriers or risks associated with the LSE's Preferred Portfolio.

Pacific Gas and Electric Company

Requirement	Assessment
Study Design	Pacific Gas and Electric Company (PG&E) provided an adequate description of modeling tools and approach used to develop its portfolios.
Study Results: Preferred and Conforming Portfolios	PG&E provided a Conforming Portfolio and two Alternative Portfolios showing both existing resources and new resources that it plans to invest in or contract with. It provided an exemplary explanation of the reasons for its preference, accompanied by tables and figures in support of its rationale, along with an explanation of how each statutory requirement was addressed. PG&E developed a month-hourly profile of renewable energy credit sales, which appears to consist of primarily solar and baseload renewables, across the planning years in its Clean Net Short Calculator filing. The purpose was to avoid taking credit for the zero-GHG generation that PG&E plans to sell. Given that PG&E's renewable portfolio is relatively diverse, its REC sales profile appears reasonable.
Study Results: Local Air Pollutant Minimization	PG&E provided an exemplary description of how its plan minimizes localized air pollutants. It provided a detailed explanation of why forecast annual emissions estimates of nitrogen oxides and particulate matter will decrease or remain unchanged, formulating a comprehensive analysis that may be replicated in future IRP cycles. PG&E also explained challenges associated with this reporting requirement, such as determining the correct attribution of emissions to other LSEs whose customers are serviced by some of PG&E's resources. Identification of disadvantaged communities was exemplary.
Study Results: Cost and Rate Analysis	PG&E provided an adequate description of its approach in considering cost and rate impacts on its customers.
Study Results: Deviations from Current Resource Plans	PG&E provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans.
Action Plan: Proposed Activities	PG&E provided an adequate description of its proposed near-term activities to implement its LSE Plan along with

	links to its Preferred Portfolio findings.
Action Plan: Barrier Analysis	PG&E provided an adequate description of the market, regulatory, financial, and other barriers or risks associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	PG&E's Conforming Portfolio did not include any new resource additions through 2030, and PG&E did not make any request for procurement authority associated with this portfolio. The Commission is considering only the LSEs' Conforming Portfolios in this IRP cycle for adoption within the Preferred System Portfolio.
Lessons Learned	PG&E provided an adequate description of lessons learned.

Next Steps for PG&E

Action required in this IRP 2017-18 cycle: None at this time.

Guidance for LSE Plan development in the next IRP cycle: None at this time.

Peninsula Clean Energy Authority

Requirement	Assessment
Study Design	Peninsula Clean Energy Authority (PCE) provided an adequate description of modeling tools and approach used to develop its portfolio.
Study Results: Preferred and Conforming Portfolios	PCE provided a Conforming Portfolio as its Preferred Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an exemplary explanation, supported by tables and figures, of the reasons for its preference and how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement. PCE did not submit an optional Alternative Portfolio.
Study Results: Local Air Pollutant Minimization	PCE provided adequate estimates of emissions of nitrogen oxides and particulate matter. Identification of disadvantaged communities was adequate.
Study Results: Cost and Rate Analysis	PCE provided an adequate description of its approach in considering cost and rate impacts on its customers.

Study Results: Deviations from Current Resource Plans	PCE provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans.
Action Plan: Proposed Activities	PCE did not provide an adequate description of its proposed near-term activities to implement its LSE Plan, as it did not provide clear links to its Preferred Portfolio findings. PCE provided an exemplary description of planned activities to conduct outreach and seek input from any disadvantaged communities that could be impacted by procurement resulting from the implementation of its Plan.
Action Plan: Barrier Analysis	PCE did not provide an adequate description of the market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	PCE marked this this section as not applicable.
Lessons Learned	PCE provided an adequate description of lessons learned.

Next Steps for PCE

Action required in this IRP 2017-18 cycle: None at this time.

Guidance for LSE Plan development in the next IRP cycle:

- Draw clearer connections between proposed near-term activities and the portfolio study results.
- Complete the Barrier Analysis section (or its equivalent) so that the Commission may evaluate the LSE's consideration of market, regulatory, financial, and other barriers or risks associated with the LSE's Preferred Portfolio.

Pico Rivera Innovative Municipal Energy

Requirement	Assessment
Study Design	Pico Rivera Innovative Municipal Energy (PRIME) provided an adequate description of modeling tools and approach used to develop its portfolio.
Study Results: Preferred and Conforming Portfolios	PRIME provided a Conforming Portfolio and an Alternative (Preferred) Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an adequate explanation of the reasons for its preference and how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement. PRIME stated that it believes its assigned load forecast to be approximately 300% too low, but it does not offer supporting evidence or explanation.
Study Results: Local Air Pollutant Minimization	PRIME stated that it minimizes localized air pollutants with early priority on disadvantaged communities but did not provide any quantitative evidence to back the claim. No attempt to provide best available estimates of emissions of nitrogen oxides and particulate matter was made. Identification of disadvantaged communities was adequate.
Study Results: Cost and Rate Analysis	PRIME did not provide an adequate description of its approach in considering cost and rate impacts on its customers. It provided only a list of generic factors affecting rates.
Study Results: Deviations from Current Resource Plans	PRIME provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans, stating that there are no deviations.
Action Plan: Proposed Activities	PRIME did not provide an adequate description of its proposed near-term activities to implement its LSE Plan, as it did not provide clear links to its Preferred Portfolio findings.
Action Plan: Barrier Analysis	PRIME provided an adequate description of the market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.

Action Plan: Proposed Commission Direction	PRIME stated that it is not currently seeking any Commission direction.
Lessons Learned	PRIME provided an adequate description of lessons learned.

Next Steps for PRIME

Action required in this IRP 2017-18 cycle: Provide best available estimates of emissions of nitrogen oxides and particulate matter associated with all emitting resources used to serve load, including system power. Refer to pages 19-22 of Desert Community Energy's IRP filing for an example of the type of information a CCA can provide to fulfill this specific filing requirement.

Guidance for LSE Plan development in the next IRP cycle:

- Provide more detail about the LSE's approach in considering cost and rate impacts on its customers.
- Draw clearer connections between proposed near-term activities and the portfolio study results.

Pilot Power Group, Inc.

Requirement	Assessment
Study Design	Pilot Power Group, Inc. (Pilot) provided an adequate description of modeling tools and approach used to develop its portfolio.
Study Results: Preferred and Conforming Portfolios	Pilot provided the CNS calculator as its Conforming and Preferred Portfolio, but it did not provide a description of existing resources and new resources that it plans to invest in or contract with, nor did it describe how its portfolio is consistent with each relevant statutory and administrative requirement. Furthermore, Pilot did not explain how its 2030 load forecast was derived, nor did it calculate an LSE-specific GHG Benchmark as required, so it is not possible to determine whether its LSE Plan achieves its GHG Benchmark.

Study Results: Local Air Pollutant Minimization	Pilot made no attempt to provide best available estimates of emissions of nitrogen oxides and particulate matter, stating that this could be provided “upon request.” A filing requirement in a Commission decision is a request. Identification of disadvantaged communities was adequate.
Study Results: Cost and Rate Analysis	Pilot did not provide an adequate analysis for projecting cost and rate impacts but instead describes its approach for addressing resource adequacy.
Study Results: Deviations from Current Resource Plans	Pilot provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans, stating that its Preferred Plan closely matches its currently filed RPS and RA procurement plans.
Action Plan: Proposed Activities	Pilot did not provide an adequate description of its proposed near-term activities to implement its LSE Plan, as it did not provide clear links to its Preferred Portfolio findings. Furthermore, it did not describe any planned activities to conduct outreach and seek input from any disadvantaged communities that could be impacted by procurement associated with its LSE Plan, stating that it has no current contracts from fossil generators in disadvantaged communities identified in California.
Action Plan: Barrier Analysis	Pilot did not provide an adequate description of the market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	Pilot marked this this section as not applicable.
Lessons Learned	Pilot did not provide any lessons learned.

Next Steps for Pilot

Action required in this IRP 2017-18 cycle: Provide best available estimates of emissions of nitrogen oxides and particulate matter associated with all emitting resources used to serve load, including system power. Refer to page 16 of Calpine Energy Solutions’ publicly available IRP filing for an example of the type of information an ESP can provide to fulfill this specific filing requirement.

Guidance for LSE Plan development in the next IRP cycle:

- Use the correct assigned load forecast when developing the Conforming Portfolio.
- Provide a description of existing resources and new resources that the LSE plans to invest in or contract with as part of its study results.
- Use the correct methodology and values when calculating the LSE-specific 2030 GHG Benchmark.
- Provide more detail about the LSE's approach in considering cost and rate impacts on its customers.
- Draw clearer connections between proposed near-term activities and the portfolio study results.
- Complete the Barrier Analysis section (or its equivalent) so that the Commission may evaluate the LSE's consideration of market, regulatory, financial, and other barriers or risks associated with the LSE's Preferred Portfolio.

Pioneer Community Energy

Requirement	Assessment
Study Design	Pioneer Community Energy (Pioneer) provided an adequate description of modeling tools and approach used to develop its portfolio.
Study Results: Preferred and Conforming Portfolios	Pioneer provided a Conforming Portfolio as its Preferred Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an adequate explanation of the reasons for its preference, but it did not explain how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement. Pioneer did not submit an optional Alternative Portfolio.

Study Results: Local Air Pollutant Minimization	Pioneer stated that it minimizes localized air pollutants with early priority on disadvantaged communities but did not provide any quantitative evidence to back the claim. No attempt to provide best available estimates of emissions of nitrogen oxides and particulate matter was made. Identification of disadvantaged communities was adequate.
Study Results: Cost and Rate Analysis	Pioneer did not provide an adequate description of its approach in considering cost and rate impacts on its customers. It provided only a list of generic factors affecting rates.
Study Results: Deviations from Current Resource Plans	Pioneer provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans, stating that there are no deviations.
Action Plan: Proposed Activities	Pioneer did not provide an adequate description of its proposed near-term activities to implement its LSE Plan, as it did not provide clear links to its Preferred Portfolio findings. However, its proposed activities appear consistent with its study results.
Action Plan: Barrier Analysis	Pioneer did not provide an adequate description of the market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	Pioneer marked this this section as not applicable.
Lessons Learned	Pioneer provided an adequate description of lessons learned.

Next Steps for Pioneer

Action required in this IRP 2017-18 cycle: Provide best available estimates of emissions of nitrogen oxides and particulate matter associated with all emitting resources used to serve load, including system power. Refer to pages 19-22 of Desert Community Energy's IRP filing for an example of the type of information a CCA can provide to fulfill this specific filing requirement.

Guidance for LSE Plan development in the next IRP cycle:

- Provide more detail about the LSE's approach in considering cost and rate impacts on its customers.

- Draw clearer connections between proposed near-term activities and the portfolio study results.
- Complete the Barrier Analysis section (or its equivalent) so that the Commission may evaluate the LSE's consideration of market, regulatory, financial, and other barriers or risks associated with the LSE's Preferred Portfolio.

Rancho Mirage Energy Authority

Requirement	Assessment
Study Design	Rancho Mirage Energy Authority (Rancho Mirage) provided an adequate description of modeling tools and approach used to develop its portfolio.
Study Results: Preferred and Conforming Portfolios	Rancho Mirage provided a Conforming Portfolio as its Preferred Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an adequate explanation of the reasons for its preference, but it did not explain how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement. Rancho Mirage did not submit an optional Alternative Portfolio.
Study Results: Local Air Pollutant Minimization	Rancho Mirage stated that it minimizes localized air pollutants with early priority on disadvantaged communities but did not provide any quantitative evidence to back the claim. No attempt to provide best available estimates of emissions of nitrogen oxides and particulate matter was made. Identification of disadvantaged communities was adequate.
Study Results: Cost and Rate Analysis	Rancho Mirage did not provide an adequate description of its approach in considering cost and rate impacts on its customers. It provided only a list of generic factors affecting rates.
Study Results: Deviations from Current Resource Plans	Rancho Mirage provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans, stating that there are no deviations.

Action Plan: Proposed Activities	Rancho Mirage did not provide an adequate description of its proposed near-term activities to implement its LSE Plan, as it did not provide clear links to its Preferred Portfolio findings. However, its proposed activities appear consistent with its study results.
Action Plan: Barrier Analysis	Rancho Mirage provided an adequate description of the market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	Rancho Mirage stated that it is not seeking any Commission direction at this time.
Lessons Learned	Rancho Mirage provided an adequate description of lessons learned.

Next Steps for Rancho Mirage

Action required in this IRP 2017-18 cycle: Provide best available estimates of emissions of nitrogen oxides and particulate matter associated with all emitting resources used to serve load, including system power. Refer to pages 19-22 of Desert Community Energy's IRP filing for an example of the type of information a CCA can provide to fulfill this specific filing requirement.

Guidance for LSE Plan development in the next IRP cycle:

- Provide more detail about the LSE's approach in considering cost and rate impacts on its customers.
- Draw clearer connections between proposed near-term activities and the portfolio study results.

San Diego Gas & Electric

Requirement	Assessment
Study Design	San Diego Gas & Electric (SDG&E) provided an adequate description of modeling tools and approach used to develop its portfolios.

Study Results: Preferred and Conforming Portfolios	SDG&E provided a Conforming Portfolio as its Preferred Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an exemplary explanation of the reasons for its preference, accompanied by tables and figures, along with an explanation of how each statutory requirement was addressed. SDG&E did not submit an optional Alternative Portfolio. SDG&E's Conforming Portfolio used an incorrect load forecast for the years 2018, 2022, and 2026, but the load forecast used for year 2030 was correct and met its assigned GHG Benchmark. Though the deviation was less than 1% in each year, SDG&E did not explain why its load forecast deviated from its assigned forecast.
Study Results: Local Air Pollutant Minimization	SDG&E provided exemplary estimates of emissions of nitrogen oxides and particulate matter. Identification of disadvantaged communities was exemplary.
Study Results: Cost and Rate Analysis	SDG&E provided an exemplary description of the method used to calculate future rate impact.
Study Results: Deviations from Current Resource Plans	SDG&E provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans, stating that there are no deviations, and that it assumes it will continue to meet its current required procurement obligations.
Action Plan: Proposed Activities	SDG&E provided an adequate description of its proposed near-term activities to implement its LSE Plan along with links to its Preferred Portfolio findings, indicating that no incremental near-term procurement, beyond its current activities, is needed. SDG&E provided an exemplary description of planned activities to conduct outreach and seek input from disadvantaged communities that could be impacted by procurement resulting from the implementation of its LSE Plan.
Action Plan: Barrier Analysis	SDG&E provided an adequate description of the market, regulatory, financial, and barriers or risks associated with its Preferred Portfolio.

Action Plan: Proposed Commission Direction	SDG&E indicated that it is not seeking any authorizations or changes to programmatic goals from the Commission at this time.
Lessons Learned	SDG&E provided an adequate description of lessons learned.

Next Steps for SDG&E

Action required in this IRP 2017-18 cycle: None at this time.

Guidance for LSE Plan development in the next IRP cycle: Use the correct assigned load forecast when developing the Conforming Portfolio.

San Jacinto Power

Requirement	Assessment
Study Design	San Jacinto Power (San Jacinto) provided an adequate description of modeling tools and approach used to develop its portfolio.
Study Results: Preferred and Conforming Portfolios	San Jacinto provided a Conforming Portfolio as its Preferred Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an adequate explanation of the reasons for its preference, but it did not explain how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement. San Jacinto did not submit an optional Alternative Portfolio.
Study Results: Local Air Pollutant Minimization	San Jacinto stated that it minimizes localized air pollutants with early priority on disadvantaged communities but did not provide any quantitative evidence to back the claim. No attempt to provide best available estimates of emissions of nitrogen oxides and particulate matter was made. Identification of disadvantaged communities was adequate.
Study Results: Cost and Rate Analysis	San Jacinto did not provide an adequate description of its approach in considering cost and rate impacts on its customers. It provided only a list of generic factors affecting rates.

Study Results: Deviations from Current Resource Plans	San Jacinto provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans, stating that there are no deviations.
Action Plan: Proposed Activities	San Jacinto did not provide an adequate description of its proposed near-term activities to implement its LSE Plan, as it did not provide clear links to its Preferred Portfolio findings. However, its proposed activities appear consistent with its study results.
Action Plan: Barrier Analysis	San Jacinto provided an adequate description of the market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	San Jacinto stated that it is not seeking any Commission direction at this time.
Lessons Learned	San Jacinto provided an adequate description of lessons learned.

Next Steps for San Jacinto

Action required in this IRP 2017-18 cycle: Provide best available estimates of emissions of nitrogen oxides and particulate matter associated with all emitting resources used to serve load, including system power. Refer to pages 19-22 of Desert Community Energy's IRP filing for an example of the type of information a CCA can provide to fulfill this specific filing requirement.

Guidance for LSE Plan development in the next IRP cycle: Use the correct assigned load forecast when developing the Conforming Portfolio.

San Jose Clean Energy

Requirement	Assessment
Study Design	San Jose Clean Energy (SJCE) provided an adequate description of modeling tools and approach used to develop its portfolios.

Study Results: Preferred and Conforming Portfolios	SJCE provided a Conforming Portfolio and an Alternative (Preferred) Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an exemplary explanation, supported by tables and figures, of how the portfolios differed and the reasons for its preference. However, it did not explain how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement. SJCE entered its load forecast into the CNS calculator incorrectly, using values for the years 2018, 19, 20, and 21 instead of 2018, 22, 26, and 30. Nevertheless, SJCE meets its assigned GHG Benchmark.
Study Results: Local Air Pollutant Minimization	SJCE did not provide the required emissions estimates of nitrogen oxides and particulate matter associated with all emitting resources used to serve load; however, it did provide a proxy for those emissions by reporting criteria pollutant emissions levels relative to the rest of California. Identification of disadvantaged communities was adequate.
Study Results: Cost and Rate Analysis	SJCE provided an adequate description of its approach in considering cost and rate impacts on its customers.
Study Results: Deviations from Current Resource Plans	SJCE marked this section as not applicable, stating that it has not filed any other resource plans.
Action Plan: Proposed Activities	SJCE provided an adequate description of its proposed near-term activities to implement its LSE Plan along with links to its Preferred Portfolio findings.
Action Plan: Barrier Analysis	SJCE provided an adequate description of the market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	SJCE used this section to recommend that the Commission provide greater certainty regarding allocation to CCAs of resources procured by the IOUs and nonbypassable charges.
Lessons Learned	SJCE provided an adequate description of lessons learned.

Next Steps for SJCE

Action required in this IRP 2017-18 cycle: Provide best available estimates of emissions of nitrogen oxides and particulate matter associated with all emitting resources used to serve load, including system power. Refer to pages 19-22 of Desert Community Energy's IRP filing for an example of the type of information a CCA can provide to fulfill this specific filing requirement.

Guidance for LSE Plan development in the next IRP cycle: Use the correct assigned load forecast when developing the Conforming Portfolio.

Shell Energy North America

Requirement	Assessment
Study Design	Shell Energy (Shell) provided an adequate description of modeling tools and approach used to develop its portfolios.
Study Results: Preferred and Conforming Portfolios	Shell provided a Conforming Portfolio and an Alternative (Preferred) Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an adequate explanation of the reasons for its preference, but it did not explain how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement. Shell calculated its LSE-specific GHG Benchmark by using its 2017 load rather than its 2030 load, but its Conforming Portfolio achieves the benchmark using either value. It filed CNS Calculator results only for its Conforming Portfolio, and it used a different, unapproved methodology for calculating GHG emissions associated with its Preferred Portfolio.
Study Results: Local Air Pollutant Minimization	Shell made no attempt to provide best available estimates of emissions of nitrogen oxides and particulate matter. Identification of disadvantaged communities was adequate.
Study Results: Cost and Rate Analysis	Shell provided an adequate description of its approach in considering cost and rate impacts on its customers.
Study Results: Deviations from Current Resource Plans	Shell provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans, stating that there are no deviations.

Action Plan: Proposed Activities	Shell provided an adequate description of its proposed near-term activities to implement its LSE Plan along with links to its Preferred Portfolio findings.
Action Plan: Barrier Analysis	Shell provided an adequate description of the market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	Shell stated that it is not seeking any Commission direction at this time.
Lessons Learned	Shell provided an adequate description of lessons learned.

Next Steps for Shell

Action required in this IRP 2017-18 cycle: Provide best available estimates of emissions of nitrogen oxides and particulate matter associated with all emitting resources used to serve load, including system power. See page 16 of Calpine Energy Solutions' plan for an example of the type of information an ESP can provide to fulfill this specific filing requirement.

Guidance for LSE Plan development in the next IRP cycle:

- Use the correct assigned load forecast when developing the Conforming Portfolio.
- Use the correct GHG emission accounting methodology established for the IRP proceeding.

Silicon Valley Clean Energy Authority

Requirement	Assessment
Study Design	Silicon Valley Clean Energy Authority (SVCE) provided an adequate description of modeling tools and approach used to develop its portfolios.
Study Results: Preferred and Conforming Portfolios	SVCE provided a Conforming Portfolio and an Alternative (Preferred) Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided an adequate explanation of the reasons for its preference, but it did not explain how its Preferred Portfolio is consistent with each relevant statutory and

	administrative requirement.
Study Results: Local Air Pollutant Minimization	SVCE stated that it minimizes localized air pollutants across its service area but did not provide any quantitative evidence to back the claim. No attempt to provide best available estimates of emissions of nitrogen oxides and particulate matter was made. Identification of disadvantaged communities was adequate.
Study Results: Cost and Rate Analysis	SVCE provided an adequate description of its approach in considering cost and rate impacts on its customers.
Study Results: Deviations from Current Resource Plans	SVCE provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans, stating that there are no deviations.
Action Plan: Proposed Activities	SVCE provided an adequate description of its proposed near-term activities to implement its LSE Plan along with links to its Preferred Portfolio findings.
Action Plan: Barrier Analysis	SVCE provided an adequate description of the market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	SVCE stated that it is not seeking any Commission direction at this time.
Lessons Learned	SVCE provided an adequate description of lessons learned.

Next Steps for SVCE

Action required in this IRP 2017-18 cycle: Provide best available estimates of emissions of nitrogen oxides and particulate matter associated with all emitting resources used to serve load, including system power. Refer to pages 19-22 of Desert Community Energy's IRP filing for an example of the type of information a CCA can provide to fulfill this specific filing requirement.

Guidance for LSE Plan development in the next IRP cycle: None at this time.

Sonoma Clean Power Authority

Requirement	Assessment
Study Design	Sonoma Clean Power Authority (SCP) provided an adequate description of modeling tools and approach used to develop its portfolios.
Study Results: Preferred and Conforming Portfolios	SCP provided a Conforming Portfolio as its Preferred Portfolio showing both existing resources and new resources that it plans to invest in or contract with. It provided a very clear and detailed explanation of the reasons for its preference, along with an explanation of how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement. SCP did not submit an optional Alternative Portfolio.
Study Results: Local Air Pollutant Minimization	SCP stated that it works to minimize criteria air pollutants but did not provide any quantitative evidence to back the claim. No attempt to provide best available estimates of emissions of nitrogen oxides and particulate matter was made. Identification of disadvantaged communities was adequate.
Study Results: Cost and Rate Analysis	SCP provided an adequate description of its approach in considering cost and rate impacts on its customers.
Study Results: Deviations from Current Resource Plans	SCP provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans.
Action Plan: Proposed Activities	SCP provided an adequate description of its proposed near-term activities to implement its LSE Plan along with links to its Preferred Portfolio findings. However, it did not provide any details about planned activities to conduct outreach and seek input from any disadvantaged communities that could be impacted by its Plan.
Action Plan: Barrier Analysis	SCP provided an adequate description of the market, regulatory, financial, or other barriers or risks associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	SCP marked this section as not applicable.
Lessons Learned	SCP provided an adequate description of lessons learned.

Next Steps for SCP

Action required in this IRP 2017-18 cycle: Provide best available estimates of emissions of nitrogen oxides and particulate matter associated with all emitting resources used to serve load, including system power. Refer to pages 19-22 of Desert Community Energy's IRP filing for an example of the type of information a CCA can provide to fulfill this specific filing requirement.

Guidance for LSE Plan development in the next IRP cycle: None at this time.

Southern California Edison

Requirement	Assessment
Study Design	Southern California Edison (SCE) provided an adequate description of modeling tools and approach used to develop its portfolios.
Study Results: Preferred and Conforming Portfolios	SCE provided a Conforming Portfolio and two Alternative Portfolios showing both existing resources and new resources that it plans to invest in or contract with. It provided an exemplary explanation of the reasons for its preference, accompanied by tables and figures in support of its rationale, along with a clear explanation of how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement.
Study Results: Local Air Pollutant Minimization	SCE provided an exemplary description of how its Preferred Portfolio minimizes localized air pollutants and other GHG emissions with early priority on disadvantaged communities. It used the PLEXOS model to develop hourly emissions intensities and provided potential sources for average emissions factors for starts and stops, formulating a comprehensive analysis that may be replicated in future IRP cycles. Identification of disadvantaged communities was exemplary.
Study Results: Cost and Rate Analysis	SCE provided an adequate description of its approach in considering cost and rate impacts on its customers.
Study Results: Deviations from Current Resource Plans	SCE provided an adequate description of the differences in quantities and budgets for procurement between its Preferred Plan and currently filed or authorized resource plans.

Action Plan: Proposed Activities	SCE provided an adequate description of its proposed near-term activities to implement its LSE Plan along with links to its Preferred Portfolio findings.
Action Plan: Barrier Analysis	SCE provided an adequate description of the market, regulatory, financial, and other barriers or risks associated with its Preferred Portfolio.
Action Plan: Proposed Commission Direction	The Commission is considering only the LSEs' Conforming Portfolios for adoption within the Preferred System Portfolio in this IRP cycle. SCE's Conforming Portfolio did not include any new resource additions through 2030, and SCE did not make any request for procurement authority associated with this portfolio.
Lessons Learned	SCE provided an adequate description of lessons learned.

Next Steps for SCE

Action required in this IRP 2017-18 cycle: None at this time.

Guidance for LSE Plan development in the next IRP cycle: None at this time.

Valley Clean Energy Alliance

Requirement	Assessment
Study Design	Valley Clean Energy Alliance (VCE) provided an adequate description of modeling tools and approach used to develop its portfolios.
Study Results: Preferred and Conforming Portfolios	VCE provided a Conforming Portfolio and two Alternative Portfolios showing both existing resources and new resources that it plans to invest in or contract with. It provided an exemplary explanation of the reasons for its preference, accompanied by tables and figures that supported its rationale. VCE also provided a very clear and organized description of how its Preferred Portfolio is consistent with each relevant statutory and administrative requirement.
Study Results: Local Air Pollutant Minimization	VCE provided best available estimates of emissions of nitrogen oxides but did not provide estimates of particulate matter. Identification of disadvantaged communities was adequate.

Study Results: Cost and Rate Analysis	VCE provided an adequate description of its approach in considering cost and rate impacts on its customers.
Study Results: Deviations from Current Resource Plans	VCE stated that it has not submitted other resource plans because it just launched in June 2018, so there are no deviations to report.
Action Plan: Proposed Activities	VCE provided an adequate description of its proposed near-term activities to implement its LSE Plan along with links to its Preferred Portfolio findings.
Action Plan: Barrier Analysis	VCE provided an exemplary description of risk factors specific to VCE and specific mitigation measures to reduce risk exposure.
Action Plan: Proposed Commission Direction	VCE stated that is not seeking direction from the Commission at this time.
Lessons Learned	VCE provided an adequate description of lessons learned.

Next Steps for VCE

Action required in this IRP 2017-18 cycle: Provide best available estimates of emissions of particulate matter associated with all emitting resources used to serve load, including system power. Refer to pages 19-22 of Desert Community Energy's IRP filing for an example of the type of information a CCA can provide to fulfill this specific filing requirement.

Guidance for LSE Plan development in the next IRP cycle: None at this time.

2.4.2. Alternative Plans

3 Phases Renewables, Inc.

Requirement	Assessment
Required Forms	3 Phases Renewables, Inc. (3 Phases) provided the following required forms: - CEC Form S1 - CEC Form S2 or EIA Form 861 or EIA Form 861S - CEC Power Content Report
Treatment of Disadvantaged Communities	3 Phases provided an adequate description of treatment of disadvantaged communities in its LSE Plan.

GHG Target Planning	3 Phases did not explain what shares of its projected 2030 load falls under which IOU territory, so it is not possible to determine whether its LSE-specific 2030 GHG Benchmark was calculated correctly. However, due to its relatively small load, this oversight is unlikely to have a significant impact on 3 Phases' GHG Benchmark.
Conforming and Alternative Portfolios	The 2030 emissions associated with 3 Phases' Conforming Portfolio exceeds its GHG Benchmark by approximately 0.5%, which is acceptable for IRP planning purposes. 3 Phases did not submit an optional Alternative Portfolio.
Statutory or Administrative Requirements	3 Phases did not speak directly to the following requirements: • 50% RPS by 2030 • Strengthen the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities • Enhance distribution systems and demand-side energy management 3 Phases provided vague references to the following requirements: • Serve customers at just and reasonable rates • Minimize impacts on ratepayers' bills • Ensure system and local reliability
Action Plan	3 Phases provided an adequate description of the actions it proposes to take in the next one to three years to implement its plan.
Barriers and Lessons Learned	3 Phases provided an adequate description of barriers and lessons learned from the IRP cycle.

Next Steps for 3 Phases

Action required in this IRP 2017-18 cycle: None at this time.

Guidance for LSE Plan development in the next IRP cycle: Use the correct methodology and values when calculating the LSE-specific 2030 GHG Benchmark.

Agera Energy, LLC

Requirement	Assessment
Required Forms	Agera Energy, LLC (Agera) provided the following required forms: - CEC Form S1 - CEC Form S2 or EIA Form 861 or EIA Form 861S - CEC Power Content Report
Treatment of Disadvantaged Communities	Agera provided an adequate description of treatment of disadvantaged communities in its LSE Plan.
GHG Target Planning	Agera calculated its LSE-specific GHG Benchmark using the correct methodology.
Conforming and Alternative Portfolios	Agera described a Conforming Portfolio, but it did not use or submit the CNS calculator, so it is not possible for staff to verify whether Agera's portfolio meets its LSE-specific GHG Benchmark. Agera did not submit an optional Alternative Portfolio.
Statutory or Administrative Requirements	Agera did not speak directly to the following requirements: • Serve customers at just and reasonable rates. • Minimize impacts on ratepayers' bills. • Ensure system and local reliability. • Strengthen the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities. • Enhance distribution systems and demand-side energy management.
Action Plan	Agera provided an adequate description of the actions it proposes to take in the next one to three years to implement its plan.
Barriers and Lessons Learned	Agera provided an adequate description of barriers and lessons learned from the IRP cycle.

Next Steps for Agera

Action required in this IRP 2017-18 cycle: None at this time.

Guidance for LSE Plan development in the next IRP cycle:

- Use the correct assigned load forecast when developing the Conforming Portfolio.
- Use the correct GHG emission accounting methodology established for the IRP proceeding.

American PowerNet Management, LP

Requirement	Assessment
Required Forms	American PowerNet provided the following required forms: - CEC Form S1 - CEC Form S2 or EIA Form 861 or EIA Form 861S - CEC Power Content Report
Treatment of Disadvantaged Communities	American PowerNet provided an adequate description of treatment of disadvantaged communities in its LSE Plan.
GHG Target Planning	American PowerNet did not calculate its LSE-specific GHG Benchmark, nor did it use the CNS Calculator.
Conforming and Alternative Portfolios	American PowerNet did not provide a Conforming or Alternative Portfolio.
Statutory or Administrative Requirements	American PowerNet did not speak directly to the following requirements: • 50% RPS by 2030. • Serve customers at just and reasonable rates • Minimize impacts on ratepayers' bills. • Ensure system and local reliability. • Strengthen the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities. • Enhance distribution systems and demand-side energy management.

Action Plan	American PowerNet provided an adequate description of the actions it proposes to take in the next one to three years to implement its plan.
Barriers and Lessons Learned	American PowerNet provided an adequate description of barriers and lessons learned from the IRP cycle.

Next Steps for American PowerNet

Action required in this IRP 2017-18 cycle: None at this time.

Guidance for LSE Plan development in the next IRP cycle:

- Provide a resource portfolio that conforms to Commission requirements.
- Use the correct methodology and values when calculating the LSE-specific 2030 GHG Benchmark.
- Use the correct GHG emission accounting methodology established for the IRP proceeding.

Bear Valley Electric Service

Requirement	Assessment
Required Forms	Bear Valley Electric Service (BVES) provided the following required forms: • CEC Form S1 • CEC Form S2 or EIA Form 861 or EIA Form 861S • CEC Power Content Report
Treatment of Disadvantaged Communities	BVES provided an adequate description of treatment of disadvantaged communities in its LSE Plan.
GHG Target Planning	BVES did not use or submit the CNS calculator, so it is not possible for staff to verify whether BVES's portfolio meets its LSE-specific GHG Benchmark. Instead, BVES provided a narrative description and tables explaining how BVES meets the benchmark using a different annual method, which was not approved by the Commission for IRP.

Conforming and Alternative Portfolios	BVES's Conforming Portfolio does not conform to Commission requirements. The portfolio did not use BVES's assigned load forecast for IRP; it did not plan out to 2030; and it used inputs and assumptions that differed from those used to develop the 2017 Reference System Portfolio. BVES did not submit an optional Alternative Portfolio.
Statutory or Administrative Requirements	BVES did not speak directly to the following requirements: • 50% RPS by 2030. • Serve customers at just and reasonable rates • Minimize impacts on ratepayers' bills. • Ensure system and local reliability. • Strengthen the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities. • Enhance distribution systems and demand-side energy management.
Action Plan	BVES did not include a specific "Action Plan" section as required, but it did include detailed information on its procurement plan.
Barriers and Lessons Learned	BVES provided an adequate description of barriers and lessons learned from the IRP cycle.

Next Steps for BVES

Action required in this IRP 2017-18 cycle: None at this time.

Guidance for LSE Plan development in the next IRP cycle:

- Provide a resource portfolio that conforms to Commission requirements.
- Provide an action plan that includes all the actions the LSE proposes to take in the next one to three years to implement its plan.
- Use the correct GHG emission accounting methodology established for the IRP proceeding.

EDF Industrial Power Services CA, LLC

Requirement	Assessment
Required Forms	EDF Industrial Power Services CA, LLC (EDF Industrial) provided the following required forms: • CEC Form S1 • CEC Form S2 or EIA Form 861 or EIA Form 861S • CEC Power Content Report
Treatment of Disadvantaged Communities	EDF Industrial provided an adequate description of treatment of disadvantaged communities in its LSE Plan.
GHG Target Planning	EDF Industrial did not explain how it calculated its LSE-specific 2030 GHG Benchmark, so it is not possible to determine whether it was done correctly.
Conforming and Alternative Portfolios	The 2030 emissions associated with EDF Industrial's Conforming Portfolio exceeds its GHG Benchmark by roughly 18%. However, EDF Industrial provided an "Alt2" portfolio that demonstrates its ability to achieve its GHG Benchmark at a higher cost.
Statutory or Administrative Requirements	EDF Industrial did not speak directly to the following requirements: • Serve customers at just and reasonable rates. • Minimize impacts on ratepayers' bills. • Ensure system and local reliability. • Strengthen the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities. • Enhance distribution systems and demand-side energy management.
Action Plan	EDF Industrial provided an adequate description of the actions it proposes to take in the next one to three years to implement its plan.
Barriers and Lessons Learned	EDF Industrial provided an adequate description of barriers and lessons learned from the IRP cycle.

Next Steps for EDF Industrial

Action required in this IRP 2017-18 cycle: None at this time.

Guidance for LSE Plan development in the next IRP cycle: Use the correct methodology and values when calculating the LSE-specific 2030 GHG Benchmark.

Just Energy Solutions Inc.

Requirement	Assessment
Required Forms	Just Energy provided the following required forms: • CEC Form S1 • CEC Form S2 or EIA Form 861 or EIA Form 861S • CEC Power Content Report
Treatment of Disadvantaged Communities	Just Energy provided an adequate description of treatment of disadvantaged communities in its LSE Plan.
GHG Target Planning	Just Energy did not calculate its LSE-specific GHG Benchmark correctly.
Conforming and Alternative Portfolios	Just Energy provided the CNS calculator as its Conforming Portfolio, but it did not describe its procurement plan. The CNS calculator was used incorrectly. The only resources entered were in the “Owned or contracted non-dispatchable GHG-emitting resources” row, and they were given a very low emissions without explanation. As a result, the CNS calculation resulted in negative emissions in 2030, despite containing no renewable resources in the supply portfolio. Just Energy did not submit an optional Alternative Portfolio.
Statutory or Administrative Requirements	Just Energy stated that it meets all statutory requirements but it does not describe how.
Action Plan	Just Energy provided an adequate description of the actions it proposes to take in the next one to three years to implement its plan.
Barriers and Lessons Learned	Just Energy provided an adequate description of barriers and lessons learned from the IRP cycle.

Next Steps for Just Energy

Action required in this IRP 2017-18 cycle: None at this time.

Guidance for LSE Plan development in the next IRP cycle:

- Use the correct assigned load forecast when developing the Conforming Portfolio.
- Use the correct methodology and values when calculating the LSE-specific 2030 GHG Benchmark.
- Use the correct GHG emission accounting methodology established for the IRP proceeding.

King City Community Power

Requirement	Assessment
Required Forms	King City Community Power (KCCP) provided the following required forms: - CEC Form S1 - CEC Form S2 or EIA Form 861 or EIA Form 861S KCCP did not file CEC Power Content Report as the CCA was just launched in 2018 and did not yet have the report.
Treatment of Disadvantaged Communities	KCCP did not provide any description of treatment of disadvantaged communities in its LSE Plan.
GHG Target Planning	KCCP used the CNS calculator correctly to show that its Conforming Portfolio meets its 2030 GHG Benchmark, but it zeroed out “Fraction of EV owners that can charge at work” without any explanation. The effect of zeroing out those values was to increase reported portfolio emissions across the planning horizon.
Conforming and Alternative Portfolios	KCCP provided the CNS calculator as its Conforming Portfolio, but it did not describe its procurement plan. KCCP did not submit an optional Alternative Portfolio.

Statutory or Administrative Requirements	KCCP did not speak directly to the following requirements: • 50% RPS by 2030. • Strengthen the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities. • Enhance distribution systems and demand-side energy management.
Action Plan	KCCP only addresses its action plan in terms of disadvantaged communities, from which it claims not to serve or procure power. There is no articulation of other actions it proposes to take in the next one to three years to implement its plan.
Barriers and Lessons Learned	KCCP did not identify any barriers or provide lessons learned.

Next Steps for KCCP

Action required in this IRP 2017-18 cycle: Provide a description of any disadvantaged communities that KCCP serves, or state that no disadvantaged communities are located in KCCP's territory.

Guidance for LSE Plan development in the next IRP cycle:

- When modifying default load modifier inputs in the CNS Calculator, provide supporting evidence or rationale for making those modifications.
- Provide an action plan that includes all the actions the LSE proposes to take in the next one to three years to implement its plan.
- Provide a description of any barriers and lessons learned from the prior IRP and/or procurement cycle.

Liberty Utilities (CalPeco Electric)

Requirement	Staff Assessment
Required Forms	Liberty CalPeco provided the following required forms: • CEC Form S1 • CEC Form S2 or EIA Form 861 or EIA Form 861S • CEC Power Content Report
Treatment of Disadvantaged Communities	Liberty CalPeco provided an adequate description of treatment of disadvantaged communities in its LSE Plan.
GHG Target Planning	Liberty CalPeco used the CNS calculator correctly to show that its Conforming Portfolio meets its 2030 GHG Benchmark.
Conforming and Alternative Portfolios	Liberty CalPeco provided an adequate description of its Conforming Portfolio. It did not submit an optional Alternative Portfolio.
Statutory or Administrative Requirements	Liberty CalPeco did not speak directly to the following requirements: • Strengthen the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities. • Enhance distribution systems and demand-side energy management. Liberty CalPeco provided vague references to the following requirements: • 50% RPS by 2030. • Serve customers at just and reasonable rates. • Minimize impacts on ratepayers' bills. • Ensure system and local reliability.
Action Plan	Liberty CalPeco provided an adequate description of the actions it proposes to take in the next one to three years to implement its plan, detailing a procurement authorization request for short-term bridging arrangements and long-term renewable supplies. A recent Commission decision (D.19-02-007) in the RPS proceeding (R.18-07-003), approved Liberty CalPeco's draft 2018 RPS Procurement Plan subject to modifications. While this decision authorized the procurement of RPS-eligible resources, other

	aspects of Liberty CalPeco's request are handled in this decision below.
Barriers and Lessons Learned	Liberty CalPeco did not identify any barriers or provide lessons learned.

Next Steps for Liberty CalPeco

Action required in this IRP 2017-18 cycle: In its 2018 IRP filing, Liberty CalPeco asked for approval to enter into a short-term bridging contract for renewables and non-renewable power, as well as long-term renewable contracts. The renewable portions of Liberty CalPeco's request have been handled in D.19-02-007.

This decision approves Liberty CalPeco's request to file any contracts entered into to replace the full requirements contract Liberty CalPeco had with NV Energy via a Tier 2 advice letter. In its November 9, 2018 filing in response to the ALJ ruling requesting further information about its procurement plans, Liberty CalPeco provided adequate information about its desire to enter into primarily renewable and storage contracts to serve its load, as well as the solicitation process it intended to undertake to secure these contracts and the short-term bridging arrangements associated with its long-term plans.

Liberty CalPeco does not operate under a bundled procurement plan like the large IOUs, and thus has to date been required to file any contracts entered into for procurement purposes as separate applications to be reviewed by the Commission.

In this decision, we find that for purposes of any non-renewable resource needs to replace its NV Energy contract in the short term, Liberty CalPeco is authorized to file any contracts resulting from its solicitation as Tier 2 Advice Letter(s) for Commission consideration. Any necessary cost recovery details may be handled in the next Liberty CalPeco energy cost adjustment clause proceeding.

Guidance for LSE Plan development in the next IRP cycle: Provide a description of any barriers and lessons learned from the prior IRP and/or procurement cycle.

PacifiCorp

Requirement	Assessment
Required Forms	PacifiCorp filed an eligible Alternative Type 2 LSE Plan, i.e., an IRP that was submitted to another public regulatory entity within the previous calendar year.
Treatment of Disadvantaged Communities	PacifiCorp provided an adequate description of treatment of disadvantaged communities in its LSE Plan.
GHG Target Planning	PacifiCorp did not provide an adequate description of how its planned future procurement is consistent with its 2030 GHG Benchmark. PacifiCorp indicated that its “participation in the Cap-and-Trade will ensure that its 0.313 million metric ton (MMT) target (established in the June 18, 2018 Ruling) is met either through procurement of Cap-and-Trade allowances or through lower emissions attributed to PacifiCorp’s California service territory.”

Next Steps for PacifiCorp

Action required in this IRP 2017-18 cycle: None at this time.

Guidance for LSE Plan development in the next IRP cycle: While PacifiCorp is not required to use the CNS Calculator for estimating its GHG emissions, since it is not within the CAISO footprint, PacifiCorp should consult with Commission staff and describe an alternative methodology that addresses its share of the 2030 GHG emissions reduction responsibility.

Redwood Coast Energy Authority

Requirement	Assessment
Required Forms	Redwood Coast Energy Authority (Redwood Coast) provided the following required forms: • CEC Form S1 • CEC Form S2 or EIA Form 861 or EIA Form 861S • CEC Power Content Report
Treatment of Disadvantaged Communities	Redwood Coast provided an exemplary description of treatment of disadvantaged communities in its LSE Plan. Even though RCEA did not have disadvantaged

	communities located in its territory as defined by the CalEnviroScreen percentage threshold, it provided relevant supplemental information on poverty and emissions.
GHG Target Planning	Redwood Coast used the CNS calculator correctly to show that its Conforming Portfolio meets its 2030 GHG Benchmark.
Conforming and Alternative Portfolios	Redwood Coast incorrectly assumed that its Conforming Portfolio needed to contain a proportional load-weighted share of the Reference System Portfolio adopted by the Commission. Nevertheless, Redwood Coast shows that it will meet its 2030 GHG Benchmark after procuring more than its assumed pro-rate share of the Reference System Portfolio. Redwood Coast did not submit an optional Alternative Portfolio.
Statutory or Administrative Requirements	Redwood Coast did not speak directly to the following requirements: • 50% RPS by 2030. • Serve customers at just and reasonable rates. • Minimize impacts on ratepayers' bills. • Ensure system and local reliability. • Strengthen the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities. • Enhance distribution systems and demand-side energy management.
Action Plan	Redwood Coast provided an adequate description of the actions it proposes to take in the next one to three years to implement its plan.
Barriers and Lessons Learned	Redwood Coast provided an exemplary description of barriers and risks to achieving its generation portfolio goals along with specific recommendations for improving the Commission's modeling assumptions and process.

Next Steps for Redwood Coast

Action required in this IRP 2017-18 cycle: None at this time.

Guidance for LSE Plan development in the next IRP cycle: None at this time.

Solana Energy Alliance

Requirement	Assessment
Required Forms	Solana Energy Alliance (Solana) provided the following required forms: • CEC Form S1 • CEC Form S2 or EIA Form 861 or EIA Form 861S • CEC Power Content Report
Treatment of Disadvantaged Communities	Solana provided an adequate description of treatment of disadvantaged communities in its LSE Plan.
GHG Target Planning	Solana used a slightly modified load forecast in the CNS calculator for the years 2022, 2026, and 2030, without explanation. Solana's Conforming Portfolio, which consists solely of Solana's pro-rata share of the Reference System Portfolio, results in 2030 emissions of 0.023 MMT, which exceeds its benchmark of 0.016 MMT by roughly 50%.
Conforming and Alternative Portfolios	Solana incorrectly assumed that its Conforming Portfolio had to contain a proportional load-weighted share of the Reference System Portfolio adopted by the Commission. Solana did not submit an optional Alternative Portfolio.
Statutory or Administrative Requirements	Solana did not speak directly to the following requirements: • 50% RPS by 2030. • Serve customers at just and reasonable rates. • Minimize impacts on ratepayers' bills. • Ensure system and local reliability. • Strengthen the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities. • Enhance distribution systems and demand-side energy management.
Action Plan	Solana provided an adequate description of the actions it proposes to take in the next one to three years to implement its plan.

Barriers and Lessons Learned	Solana noted that the Solana Beach City Council has adopted a risk management policy and established a risk management team to address risks associated with market volatility. Solana did not provide lessons learned.
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Next Steps for Solana

Action required in this IRP 2017-18 cycle: None at this time.

Guidance for LSE Plan development in the next IRP cycle: Use the correct assigned load forecast when developing the Conforming Portfolio.

The Regents of the University of California

Requirement	Assessment
Required Forms	The Regents of the University of California (UC Regents) provided the following required forms: • CEC Form S1 • CEC Form S2 or EIA Form 861 or EIA Form 861S • CEC Power Content Report
Treatment of Disadvantaged Communities	UC Regents provided an adequate description of treatment of disadvantaged communities in its LSE Plan.
GHG Target Planning	UC Regents used the CNS calculator correctly to show that its Conforming Portfolio meets its 2030 GHG Benchmark.
Conforming and Alternative Portfolios	UC Regents provided an adequate description of its Conforming Portfolio. It did not submit an optional Alternative Portfolio.
Statutory or Administrative Requirements	UC Regents did not speak directly to the following requirements: • 50% RPS by 2030. • Serve customers at just and reasonable rates. • Minimize impacts on ratepayers' bills. • Ensure system and local reliability. • Strengthen the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities. • Enhance distribution systems and demand-side

	energy management.
Action Plan	UC Regents provided an adequate description of the actions it proposes to take in the next one to three years to implement its plan.
Barriers and Lessons Learned	UC Regents provided an adequate description of barriers and lessons learned from the IRP cycle.

Next Steps for UC Regents

Action required in this IRP 2017-18 cycle: None at this time.

Guidance for LSE Plan development in the next IRP cycle: None at this time.

Tiger Natural Gas, Inc.

Requirement	Assessment
Required Forms	Tiger Natural Gas, Inc. (Tiger) provided the following required forms: • CEC Form S1 • CEC Form S2 or EIA Form 861 or EIA Form 861S • CEC Power Content Report
Treatment of Disadvantaged Communities	Tiger provided an adequate description of treatment of disadvantaged communities in its LSE Plan.
GHG Target Planning	Tiger did not explain what shares of its projected 2030 load falls under which IOU territory, so it is not possible to determine whether its LSE-specific 2030 GHG Benchmark was calculated correctly. However, due to its relatively small load, this oversight is unlikely to have a significant impact on Tiger's GHG Benchmark.
Conforming and Alternative Portfolios	The 2030 emissions associated with Tiger's Conforming Portfolio exceeds its GHG Benchmark by approximately 4%, which is acceptable for IRP planning purposes. Tiger submitted an Alternative Portfolio containing one minor adjustment to the CNS calculator, which was to set the assumed "Electric Vehicle Load - Home Charging Only" load inputs to zero. This adjustment reduced Tiger's estimated GHG emissions to below its 2030 GHG

	Benchmark. Because Tiger does not serve any residential load, this adjustment was reasonable.
Statutory or Administrative Requirements	Tiger did not speak directly to the following requirements: • 50% RPS by 2030. • Serve customers at just and reasonable rates. • Minimize impacts on ratepayers' bills. • Ensure system and local reliability. • Strengthen the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities. • Enhance distribution systems and demand-side energy management.
Action Plan	Tiger provided an adequate description of the actions it proposes to take in the next one to three years to implement its plan.
Barriers and Lessons Learned	Tiger provided an adequate description of barriers and lessons learned from the IRP cycle.

Next Steps for Tiger

Action required in this IRP 2017-18 cycle: None at this time.

Guidance for LSE Plan development in the next IRP cycle: None at this time.

2.4.3. LSEs Claiming Exemptions from IRP Requirements

Anza Electric Cooperative

Anza Electric Cooperative submitted copies of its Form EIA-861, Schedule 2, Part B, to substantiate its eligibility for exemption from the requirements to file an LSE Plan. Although Anza submitted copies for years 2016 and 2017, it did not provide a copy for year 2015, citing an "Oracle System Error." We agree that Anza Electric Cooperative is exempt from IRP filing requirements.

EnerCal USA (doing business as (dba) YEP Energy)

EnerCal USA submitted that it “has not signed up any retail electricity customers, nor has it ever served direct access load, in California,” and that “it has not procured energy or capacity, and it does not have any forecast need for such procurement, to serve load in California.” We agree that EnerCal USA is not required to provide an IRP in this cycle, but will be required to submit documentation as long as it is registered to serve load in California.

Gexa Energy

Gexa Energy submitted that it “stopped serving retail customers in California after the second quarter of 2016,” and that it “maintains its ESP registration should it decide to resume serving retail customers at a future date. Further, Gexa “encourages the Commission to consider modifying D.18-02-018 or future IRP requirements on its own motion to exempt any LSE that has no retail customers, no load and no procurement from future IRP compliance obligations until such a time as it begins to serve or plans to serve retail customers. In the alternative, a simple declaration from such a situated LSE attesting to the fact that it has no retail customers, serves no load, and has no procurement should be acceptable as well and further the interests of administrative efficiency.” We agree that Gexa is not required to provide an IRP in this cycle, but will be required to submit similar documentation as long as it is registered to serve load in California.

Liberty Power Delaware

Liberty Power Delaware (LPD) submitted that it “does not serve and has never served any retail customers in California and has no procurement.”

Further, LPD “encourages the Commission to consider modifying D.18-02-018 or future IRP requirements on its own motion to exempt any LSE that has no retail customers, no load and no procurement from future IRP compliance obligations until such a time as it begins to serve or plans to serve retail customers. In the alternative, a simple declaration from such a situated LSE attesting to the fact that it has no retail customers, serves no load, and has no procurement should be acceptable as well and further the interests of administrative efficiency.” We agree that LPD is not required to provide an IRP in this cycle, but will be required to submit similar documentation as long as it is registered to serve load in California.

Liberty Power Holdings

Liberty Power Holdings submitted that all of its retail customers in California voluntarily returned to bundled service as of December 29, 2016. Further, Liberty Power Holdings states that it “encourages the Commission to consider modifying D.18-02-018 or future IRP requirements on its own motion to exempt any LSE that has no retail customers, no load and no procurement from future IRP compliance obligations until such a time as it begins to serve or plans to serve retail customers. In the alternative, a simple declaration from such a situated LSE attesting to the fact that it has no retail customers, serves no load, and has no procurement should be acceptable as well and further the interests of administrative efficiency.” We agree that Liberty Power Holdings is not required to provide an IRP in this cycle, but will be required to submit similar documentation as long as it is registered to serve load in California.

Plumas-Sierra Rural Electric Cooperative

Plumas-Sierra Rural Electric Cooperative submitted copies of its Form EIA-861, Schedule 2, Part B, for the years 2016-2017 to substantiate its eligibility for exemption from the requirements to file an LSE Plan. We agree that based on its documentation provided, Plumas-Sierra Rural Electric Cooperative is exempt from filing an IRP.

Praxair Plainfield

Praxair Plainfield submitted that it “has not served any retail customers since 2008 and has no procurement,” and that it “maintains its ESP registration should it decide to resume serving retail customers at a future date.” We agree that Praxair Plainfield is not required to provide an IRP in this cycle, but will be required to submit similar documentation as long as it is registered to serve load in California.

Surprise Valley Electric Corp

Surprise Valley submitted copies of its Form EIA-861, Schedule 2, Part B, for the years 2015-2017 to substantiate its eligibility for exemption from the requirements to file an LSE Plan. We agree that based on the documentation provided by Surprise Valley, it is exempt from the requirements to file an IRP.

Valley Electric Association, Inc.

VEA submitted copies of its Form EIA-861, Schedule 2, Part B, for the years 2016-2017 to substantiate its eligibility for exemption from the requirements to file an LSE Plan. We agree that based on the documentation provided by VEA, it is exempt from the requirements to file an IRP.

2.4.4. LSEs Failing to Submit Any Documentation**Commercial Energy of California**

Commercial Energy of California did not file an LSE Plan as required by August 1, 2018. On August 6, 2018, Commercial Energy submitted a request for an extension of time until September 1, 2018. As of the issuance of this Proposed Decision, Commercial Energy has yet to file an LSE Plan. Thus, Commercial Energy is out of compliance with D.18-20-018 requirements. In future IRP cycles, we will implement a citation process so that entities failing to provide any documentation will face monetary sanctions.

3. Preferred System Portfolio

On January 11, 2019, an ALJ ruling was issued containing the staff recommendations for the Preferred System Portfolio to be adopted by the Commission and used by the CAISO in the TPP. This ruling and its attachments, as well as the previous rulings on September 24, 2018 and November 15, 2018, detailed the manner in which Commission staff aggregated the individual IRPs and then conducted production cost modeling to evaluate the results of the aggregated portfolio, and whether the portfolio would meet the 2030 GHG emissions planning target of 42 MMT adopted by the Commission in D.18-02-018. This section discusses our determination on the PSP to be adopted.

3.1. Individual IRP Aggregation Analysis, Production Cost Modeling, and PSP Recommendation**3.1.1. Individual IRP Aggregation Analysis**

The aggregation of individual LSE IRPs into a single CAISO system-wide portfolio, conducted by Commission staff, is referred to herein as the hybrid conforming portfolio (HCP). In order to construct a feasible portfolio in the year

2030, Commission staff made some adjustments to aggregate LSE resource plans to fit within the technical resource potential in certain geographic areas and in order to utilize existing transmission availability within California that coincides with the assumptions made earlier when using the RESOLVE capacity expansion model.

This was partly necessary due to the large number of new LSEs entering the generation procurement market perhaps not being fully aware of the limits on technical potential, as well as their inability to be aware of the planned activities of numerous other entities also entering the market recently. While new entry of LSEs into the market may slow down as CCA formation becomes geographically saturated, the aggregation process that will take place during each IRP cycle inherently helps bridge the gap between the knowledge of individual LSEs and the overall system needs.

The aggregation conducted by staff includes both baseline and new resource plans included in individual IRPs filed by LSEs. Baseline resources include those that already exist or are already planned to be built as of 2018. New resources include planned purchases of energy or capacity from resources that are not yet in existence or contracted as of 2018, but that LSEs may build or purchase in the future. New resources are comparable to those resources selected from the wider set of “candidate resources” by the RESOLVE model that was used to develop the RSP.⁷

Commission staff aggregated the baseline and new resources contained in the LSEs’ conforming plans. Conforming plans were required by LSEs with

⁷ Thus, when new resources are mentioned throughout this ruling, this refers to planned new resources that may or may not actually be built in the future.

forecast annual load over 700 gigawatt-hours (GWh) during any of the first five years of the IRP planning horizon. LSEs meeting this threshold were instructed to use inputs and assumptions that aligned with the 2017 IEPR and/or the RSP, though LSEs were permitted to depart from the exact mix of resources found in the RSP portfolio.

Two large utilities filed preferred portfolios that were different from their conforming portfolios. In the case of SCE and PG&E, both filed preferred portfolios that utilized an assumption about cost allocation among LSEs that was not adopted by the Commission. SCE also utilized an assumption of a lower GHG emissions target in 2030 for the electric sector, which could not be compared across LSEs who did not plan to achieve the same target.

Several smaller LSEs made small adjustments to their conforming portfolios to construct their preferred portfolios; those changes did not result in impacts on system-level resources that necessitated their being modeled separately. Finally, Commission staff needed to ensure that all of the LSE loads added to the total system load, in order to ensure an accurate picture of the total system. For all these reasons, Commission staff focused only on the conforming portfolios of all LSEs for purposes of the analysis.

The aggregated conforming portfolio compiled by Commission staff was then compared against the existing NQC available on the CAISO system. The planned new resources of all LSEs were also compared against the new resources selected by RESOLVE to develop the 2017 RSP, originally based on the 2016 IEPR and later updated to take into account the 2017 IEPR assumptions. Finally, staff verified that new resource purchase proposals did not exceed the resource potential or existing transmission availability and made adjustments to stay within those limits. These adjustments are described below.

Commission staff identified four regions where the proposed new wind resources exceeded the resource potential assumed in the RESOLVE model: Northern California (438 MW), Solano (169 MW), Southern California Desert (120 MW), and Riverside East Palm Springs (58 MW). These resources were adjusted to come from nearby regions for purposes of the production cost modeling of the HCP.

In addition, there were five regions where the renewable buildout proposed would unnecessarily exceed available transmission capacity in California, even on an energy-only basis, recognizing that these assumptions represent some amount of uncertainty. These regions are: Central Valley North Los Banos, Greater Carrizo, Southern California Desert, Northern California, and Solano. Adjustments were also made to preserve geographic location wherever possible by converting to energy-only status, or to move resources to nearby locations when the transmission assumptions were exceeded. Solar was converted to energy-only status more often than wind resources, because of differences in capacity value.

No adjustments were made to specific out-of-state resource selections even though such selections may imply transmission upgrades (*e.g.*, Wyoming or New Mexico resources). Commission staff assumed that when LSEs selected specific out-of-state resources, it was an intentional choice (as opposed to a generic one), as the best option to meet their needs. All of the adjustments were made to the portfolios in 2030, and then back-casted to modify portfolios in earlier years of the planning horizon.

As an improvement from earlier production cost modeling studies performed on the RSP, Commission staff also checked whether certain existing out-of-state renewables should be modeled as delivering into the CAISO system

or not, based on the project's location, product content category, and contractual details. Commission staff also improved upon the earlier studies by changing certain non-CAISO gas-fired units to be modeled as dispatched into the regions where they are located, even when they have the ability to be dynamically-scheduled into the CAISO markets. This change was based on an improved understanding about how this group of non-CAISO gas-fired units participate in the wholesale market.

Commission staff made these adjustments in consultation with individual LSEs, and in some cases, resulted in modified IRPs filed by a few LSEs to reflect the modified resource assumptions. Several LSEs also filed corrections to their resource selections when errors or inconsistencies were pointed out by Commission staff. Many LSEs also characterized their resource choices as indicative but not final, since they have not yet conducted solicitations to choose particular sites or projects to be contracted. An exception to this was the selection of out-of-state resources, which appeared to be more intentional on the part of the LSEs.

Also of note, the resource plans included in the HCP developed by Commission staff represent the LSEs filing "standard" plans only. A small number of LSEs file "alternative" plans (described further in D.18-02-018, which are essentially short form IRPs). The alternative plan filers represent approximately 3% of load in the electricity system and are mostly represented by small ESPs. Data contained in alternative plan filings were reviewed, as indicated in Section 2 above, but are not reflected in the system-wide analysis conducted by Commission staff. It is also worth noting that the resources of publicly-owned utilities, either part of the CAISO system or outside of it, are also

not reflected in the HCP, though load from customers of all LSEs in the CAISO was taken into account.

In the last major adjustment to the modeling assumptions previously utilized to develop the RSP, for the HCP analysis, Commission staff utilized an assumption of a 40-year life for fossil-fueled resources, which serves as a proxy for likely retirement of either inefficient units or those less likely to have long-term contracts because they are nearing the end of their useful lives. Commission staff also augmented the 40-year life assumptions by using existing contract information to defer assumed retirement until the end of the contract, if the unit in question still had a contract in place at age 40. The 40-year life assumptions was developed partly in response to stakeholder concerns about the RSP relying on assumptions about gas-fired resources that were too optimistic (assuming that resources would remain, in the absence of contracts and beyond their useful lives) and partly because of the absence of these types of resources in the IRPs filed by individual LSEs in 2018. The 40-year-life assumption was previously used in the long-term procurement planning (LTPP) process as well as some previous CAISO TPP analyses.

3.1.2. Production Cost Modeling Results

In general, Commission staff analysis of the HCP determined that it results in a reasonably reliable and operable portfolio that can be studied further in the CAISO's TPP process. Since the portfolio represents LSE planning preferences, updated from the RSP, it represented a step forward to be further analyzed.

3.1.2.1. Resource Portfolio Results

The level of commitment to planned baseline and new energy purchases over time varies by type of LSE. The IOUs generally plan their resource mix to

meet a declining portion of their current total load over time, reflecting an expectation of load departure.

CCAs are the LSEs with the vast majority of planned new resource purchases through 2030, reflecting their expectation of growing load. Finally, the IRPs of the ESPs generally reflect their shorter planning horizon in a competitive market. Overall, the CCAs plan the most long-term new resource purchases to meet their expected load, while ESPs and IOUs expect additional short-term market purchases to fill out their portfolios.

With respect to combined baseline and new resources, the largest categories are wind, hydro, nuclear, and solar, in terms of total planned purchases of energy. Nuclear resources decline after 2025 due to the approved retirement of Diablo Canyon. Many LSEs also indicate plans to purchase unspecified system power. It is also important to note that the analysis was not conducted with the purpose of determining compliance with resource adequacy requirements, and thus does not imply any assessment or conclusion about resource adequacy.

In general, the HCP indicates a decreasing reliance on existing resources over time, especially non-renewable resources. Resources also receiving less long-term commitment compared to the RSP portfolio and over the planning time horizon include geothermal, biogas, pumped storage, and hydro, in addition to the thermal (non-renewable) resources.

Existing solar thermal resources, on the other hand, appear to be fully utilized throughout the period to 2030. Wind, solar photovoltaics (PV), and nuclear resources are also heavily committed, along with battery storage.

These resource utilization findings lead to questions that are already being surfaced in several venues about the long-term future of the numerous fossil-

fueled thermal plants that may be without contracts by the end of the next decade, even as they may be needed for reliability purposes.

In terms of new resources, the HCP includes the majority of new resource buildout being driven by CCA load growth. While the IOUs and ESPs, aggregated together, propose to invest in approximately 1,000 MW of new resources by 2030, CCAs in aggregate propose more than 10,000 MW.

Of that total planned resource investment, more than 60% is planned to be solar PV. Another 10% or so is expected to come from battery storage, with the remainder split between biogas, biomass, geothermal, and wind.

Compared with the resource portfolio outlined in the RSP, as adjusted for the 2017 IEPR updated assumptions, LSEs in their IRPs plan to buy or contract with 4-hour batteries generally instead of 1-hour batteries, about 1,400 MW less geothermal, about 900 MW more in state wind, and similar amounts of out-of-state wind from specific areas such as New Mexico and Wyoming.

Commission staff also had to account for the impact of the Commission's 1,325 MW storage target and reconcile it with the planned additions of battery storage, resulting in a total of 2,480 MW assumed to be online in the CAISO system by 2030.

3.1.2.2. Feasibility of Hydroelectric Generation Used in LSE Plans

Due to the number of comments raised by parties about the use of hydroelectric generation in LSE plans, Commission staff conducted a more detailed investigation into the feasibility of the use of these types of resources out to 2030, both within California and imported from the Pacific Northwest.

Commission staff first gathered data about the historical level of imported hydroelectricity, in-state production, and utilization by LSEs. Staff also looked at

the projected utilization of hydroelectricity by publicly owned utilities, in order to form a complete picture of statewide production and usage data.

In summary, Commission staff found that the proposed utilization of hydroelectric resources from the Pacific Northwest is for energy purposes only and is within historical import levels. This does not represent an analysis of the potential for contract or resource shuffling, but rather just a physical analysis of the amount of energy being imported.

Commission staff analysis indicates that the utilization of California hydro, however, has some risks relative to historical production levels, because California hydro production is highly sensitive to drought conditions and decreases significantly in dry years. LSEs' proposed utilization of hydro appears considerably more at risk of drought conditions in California than in the Pacific Northwest.

In the future, Commission staff plan to make several improvements to the analysis of hydroelectric resources, including revisiting import assumptions in RESOLVE, requiring LSEs to provide a description in their IRPs of plans to address drought risk, revising the CNS calculator to more clearly distinguish between in-state and imported hydro resources, and developing more specific filing requirements to enable analysis and monitoring of the potential for resource shuffling. Commission staff are also actively communicating with staff from the Northwest Power and Conservation Council on these issues, in order to understand potential changes in the availability of imported Northwest hydro in the future.

3.1.2.3. Reliability Results

All of the resource assumptions and adjustments were utilized in the SERVIM model, within which staff conducted a reliability assessment for 2030.

For the 2030 analysis, the model uses 35 equally weighted weather years representing patterns from 1980 to 2014. In addition, there were five weighted economic output levels representing uncertainty in future electric load levels. The reliability metrics, including frequency, duration, and magnitude of reliability events, are reported as expected values (probability weighted averages).⁸

For the reliability assessment, Commission staff focused on two main studies. The first was the “as-found” loss of load study, which utilized the HCP already described. The second was a calibrated loss of load expectation (LOLE) study, where staff removed additional existing fossil-fueled resources to bring the system reliability level to a 0.1 LOLE per year target, which corresponds to the industry standard of “one day in ten years” for loss-of-load events. In both cases, existing fossil-fueled thermal resources were assumed to retire at 40 years of age.

For the as-found study, Commission staff found very few loss-of-load events in 2030. Commission staff defined a loss-of-load event as an instance where hourly unit dispatch is unable to serve firm electric demand or necessary reserves (spinning reserves and regulation up, but not non-spinning reserves) either by providing capacity or economically curtailing load. All of the loss-of-load metric results were small, though staff’s modeling results did show a loss of non-spinning reserves. Generally, the system performed more reliably than the 0.1 LOLE target. Modeling results also showed that loss of non-spinning reserves occurred somewhat more often than loss-of-load events.

⁸ See Attachment A of the January 11, 2019 ALJ ruling in this proceeding for more detail on these metrics and results.

However, shortages of non-spinning reserves were not defined as a reliability event and were not analyzed further.

When staff calibrated the study to meet the 0.1 LOLE target by removing additional existing capacity, the reliability metrics indicated a decrease in reliability relative to the as-found system, as expected. Expected unserved energy was approximately 100 megawatt-hours (MWh) and mostly occurred in July through September, in the hours between 6 and 9 p.m. It is also important to note that the capacity removed in these studies is based on a modeling convention and is not meant to be indicative or predictive of actual unit retirements.

In both the as-found study and the calibrated LOLE study, Commission staff found that there would be more imports, fewer exports, and less curtailment than the previous SERVVM study of the RSP, calibrated to the 2017 IEPR assumptions (first presented in the September 24, 2018 ALJ ruling).

Changes to amounts and types of resources delivering energy within the CAISO area contributed to this outcome. The changes include a decrease in the amount of thermal generation within the CAISO, fewer baseload resources such as geothermal and cogeneration, less existing out-of-state wind being counted as within the CAISO, and lower assumed production from behind-the-meter (BTM) solar PV (though the amount of solar capacity assumed is the same). The HCP has significantly higher unspecified imports to make up for the reduced amounts of CAISO generation. Curtailment is also reduced because there is less must-take generation in the CAISO area.

When additional existing capacity was removed for the calibrated LOLE study, unspecified imports further increased, and curtailment further decreased. The removal of additional capacity included removal of must-run cogeneration

which therefore allowed an increase in usable renewable output to serve load and increased natural gas peaking utilization to integrate the renewables.

In both the as-found and the calibrated LOLE study cases, the CAISO would be a net importer in 11 months of the year. In general, storage volumes look similar across different seasons and weather. Significant amounts of spring mid day excess energy are exported and/or curtailed.

3.1.2.4. Renewables Portfolio Standard Results

Commission staff also reported some metrics from the SERVVM modeling of the HCP related to the renewables portfolio standard (RPS) requirements. Staff found that because the HCP contained less geothermal energy, moderately less existing out-of-state wind counted as within the CAISO, and moderately higher retail sales from less assumed BTM solar PV energy production (though with identical solar capacity amounts), these changes, mostly associated with LSE resource selection, collectively resulted in a lower calculated CAISO RPS percentage (51.5%), relative to the SERVVM results from the RSP using 2017 IEPR assumptions (58.3%).

As previously reported by Commission staff, curtailment of renewables is quite a bit higher in the SERVVM analysis of the RSP with the 2017 IEPR assumptions (9.8%), than was originally reported by RESOLVE (4.2%), even when modeling the same portfolio. The model input changes introduced with the HCP resulted in moderately lower curtailment (8%). These results are likely due to modeling differences and not predictive of actual curtailment differences between the cases; more work is planned for the next IRP cycle to align RESOLVE and SERVVM such that curtailment and other outputs are in closer agreement.

3.1.2.5. 2030 Emissions Results

Commission staff also reported criteria pollutant and GHG emissions results from analyzing the HCP.

For criteria pollutants, staff estimated total NO_x and PM_{2.5} emissions as the sum of emissions from steady-state operations and hot, warm, and cold starts. Staff used fuel burn, number and type of starts, and generation output from SERVIM, applying appropriate emissions factors, to estimate emissions as a post-processing step. Where generator subtype (different types of thermal generators) was available, staff used that subtype to identify the appropriate emissions factor. No NO_x factors for warm starts were available, so an average of cold and hot factors was used as an estimate. Criteria pollutants were counted from within the CAISO only, and not from unspecified imports. Then, emissions were grouped into two simplified categories: those from generating units located in disadvantaged communities as defined by the California Environmental Protection Agency and in D.18-02-018 (even if the emissions may migrate beyond) and those from generation not located in disadvantaged communities (even if emissions may migrate into such communities).

Emissions are reported only from fossil-fueled resources, and do not include emissions from biomass, biogas, or geothermal resources. Emissions from unspecified imports are reported for GHG only, utilizing a uniform emissions factor from the California Air Resources Board (CARB).

Generally, the HCP as-found and the calibrated LOLE study show lower criteria pollutant emissions in all categories than the RSP with 2017 IEPR assumptions. This is partly due to the increased reliance on unspecified imports relative to the RSP with 2017 IEPR assumptions, because the imports are not assigned criteria pollutant emissions in California. It is also due to the thermal

generation that was retired in the HCP but retained in the RSP with 2017 IEPR assumptions.

For GHG emissions, on the other hand, the HCP and the calibrated LOLE study both show increased GHG emissions relative to the RSP with 2017 IEPR assumptions. While the Commission adopted in D.18-02-018 an estimated statewide electric sector contribution to GHG emissions of 42 MMT on a statewide basis, this corresponds to 34 MMT within the CAISO area, as reported by the RESOLVE model. The comparable SERVVM analysis of the CAISO area using the RSP with 2017 IEPR assumptions resulted in an estimate of 38 MMT, primarily due to more granular representation of unit operations and generator data (aggregate heat rates modeled in SERVVM were higher than in RESOLVE). The HCP modeled in SERVVM further increases the 38 MMT within CAISO to around 43 MMT. This is partly driven by the higher reliance on unspecified imports which do affect GHG emissions based on the import emission factor assigned by CARB. The HCP also had less geothermal, moderately less existing out-of-state wind counted as within the CAISO, and moderately less assumed BTM solar PV energy production, which each contribute to the outcome of higher emissions.

3.1.3. Staff Recommendation for Preferred System Portfolio

At the conclusion of the analysis described above, at the January 7, 2019 workshop explaining the differences between the analyzed results of the HCP and the RSP (and the January 11, 2019 ALJ ruling requesting party comment on the analysis), Commission staff recommended that the Commission adopt the HCP as the preferred system portfolio, since it represents the best snapshot of LSE resource choices and a starting point for further analysis and planning that

will take place beginning with the RSP for the 2019-2020 cycle of IRP. As discussed further below, this decision does not adopt that recommendation.

3.2. Comments of Parties

In comments and reply comments filed on January 31, 2019 and February 11, 2019, respectively, parties voiced their opinions about whether the HCP is the right portfolio for the Commission to use for future planning efforts, as well as for the CAISO for use in the TPP analysis.

Parties were fairly divided on their comfort with the HCP as the basis for both future planning efforts and CAISO transmission analysis. Approximately 15 parties supported the HCP being adopted as the Preferred System Portfolio (PSP), with many offering conditions, such as calling it an “interim plan” and/or including caveats that the HCP is not actually preferred by the Commission, or that it should not result in resource procurement authorization or new transmission. Parties supporting the HCP with caveats included: SDG&E, CAISO, BAMx, the Joint CCAs, Calpine, CORD, POC, CESA, PG&E, NRG, LS Power, AReM, SDCWA, SWPG, Wellhead, and WPTF. Ormat did not support the HCP, but did not oppose it either.

Numerous parties opposed the HCP being used as the basis for the PSP, including TURN, Cal Advocates, SCE, CEDC, Hell’s Kitchen, CEERT, CEJA and Sierra Club, GPI, IID, Reid, and EDF. Some of these parties, including Cal Advocates, SCE, CEJA and Sierra Club, IID, and Reid, recommended instead utilizing the RSP with the 2017 IEPR assumptions, and with some additional modifications. This modified RSP would become the PSP.

Several parties also expressed concerns about the use of the HCP, but did not offer an alternative option. Those parties included AEE, LSA, and DOW.

In addition, several parties, including CEERT and EDF, recommended that a PSP not be adopted at this time at all, or that it be only labeled an “interim” plan.

With respect to the reliability analysis of the HCP conducted by staff, the majority of parties commented that a determination was not really possible. Some are concerned that the SERVVM analysis does not account for local reliability or sub-hourly effects, and that a reliability check was not conducted for each individual LSE’s IRP.

With respect to the geographic adjustments made by staff to the location of some renewable choices by LSEs, numerous parties were concerned about the change from full deliverability to energy-only status for some renewables. In addition, parties commented that staff could have been more transparent about when and why these changes were made. In general, many parties felt that the Commission needs better coordination with the CAISO regarding transmission availability and congestion, to avoid some of these issues in the future.

On the subject of the hydroelectric analysis conducted by staff alongside the production cost modeling, most parties were supportive of continuing to look at these issues. The CCA parties were very supportive of the finding that the hydroelectric utilization, including from the Pacific Northwest, was feasible in the HCP, based on historical data, and thus argued that their planned procurement is reasonable.

Some parties recommended further exploring energy-only contracts for hydro and aligning resource choices with portfolio need. GPI identified the need to establish “standardized risk factors” for reliance on hydro in the future. Several parties recommended future modeling should utilize a lower resource availability assumption, coordinate with the CAISO on assumptions for in-state

vs. Northwest hydro, and coordinate with the CEC with respect to expected publicly-owned utility (POU) hydro utilization.

To mitigate drought risk in future IRPs, numerous parties supported having a hydro sensitivity representing a low water year, with high renewable curtailment expected. Most parties also supported the idea that LSEs should be required to include in their IRPs “hedging strategies” for hydro power, though PG&E would prefer that this be a topic for the rulemaking on climate adaptation.

Many parties also argued that more detailed Western Electricity Coordinating Council (WECC) -wide modeling is needed, on a seasonal or more granular basis. In addition, emissions factors for unspecified imports should be reexamined, as well as transmission costs rolled into the costs of out-of-state hydro resources for accuracy. NRDC, in particular, recommended that staff in the next cycle of IRP look for deficiencies in the WECC-wide anchor data set, though recognized that the Commission may not have adequate resources to undertake this task.

With respect to the criteria pollutant emissions results from the HCP analyzed, there were a few specific comments from parties. First, some parties felt that the 40-year retirement assumption for cogeneration was not realistic, because those units are unlikely to retire if they are needed for industrial processes. In addition, many parties commented that the Commission has not done enough work prioritizing issues in disadvantaged communities, and that more work is needed to attribute air pollutants correctly.

On the GHG emissions analysis, several parties including Cal Advocates, noted the disconnect between aggregate GHG emissions and the CNS calculator submissions by LSEs in their individual IRPs. They also noted the disconnect

between RESOLVE and SERVVM emissions results, which staff has previously acknowledged and explained.

The January 11, 2019 ALJ ruling also contained a question about whether the Commission needs to institute more specific and stringent filing requirements in the next cycle of IRP, for the individual IRP filings. Opinions on this issue were split. GridLiance and AEE generally felt there should be more information required about the certainty of resources and their stage of development. Cal Advocates was concerned about conformance with RPS requirements, and that any deviations from RPS requirements be explained thoroughly. PG&E recommended that all LSE requirements align with IOU showings, especially with respect to firmness of resource commitments. In addition, PG&E would like all LSEs to utilize the CNS calculator in their templates. TURN would like to have a tighter focus on addressing resource shuffling, either by more robust and detailed Commission analysis or requiring affidavits from sellers about how the resource will be replaced in their portfolio.

Four parties opposed any tighter requirements on individual IRPs, including AReM, CESA, Joint CCAs, and Ormat. AReM and Ormat focused their comments on refinement to existing IRP filing requirements, including allowing continued flexibility for resource type and location due to uncertainty that is inherent in long-term planning. CESA recommended consistency and standardization, but not any tighter requirements. The Joint CCAs argued that IRP requirements are only for coordination purposes and to help the state in planning, but their procurement is independent of this process.

SCE recommended initiating a stakeholder process to refine the filing requirements for IRPs. NRDC suggested that the IRP provide directional guidance for additional procurement, but that individual resource proceedings

should authorize additional procurement, if necessary. SDCWA commented that individual LSEs should be required to file IRPs out to 2045 and not just to 2030. And finally, the CAISO wanted additional attention to what happens if the LSEs do not meet their GHG emissions targets.

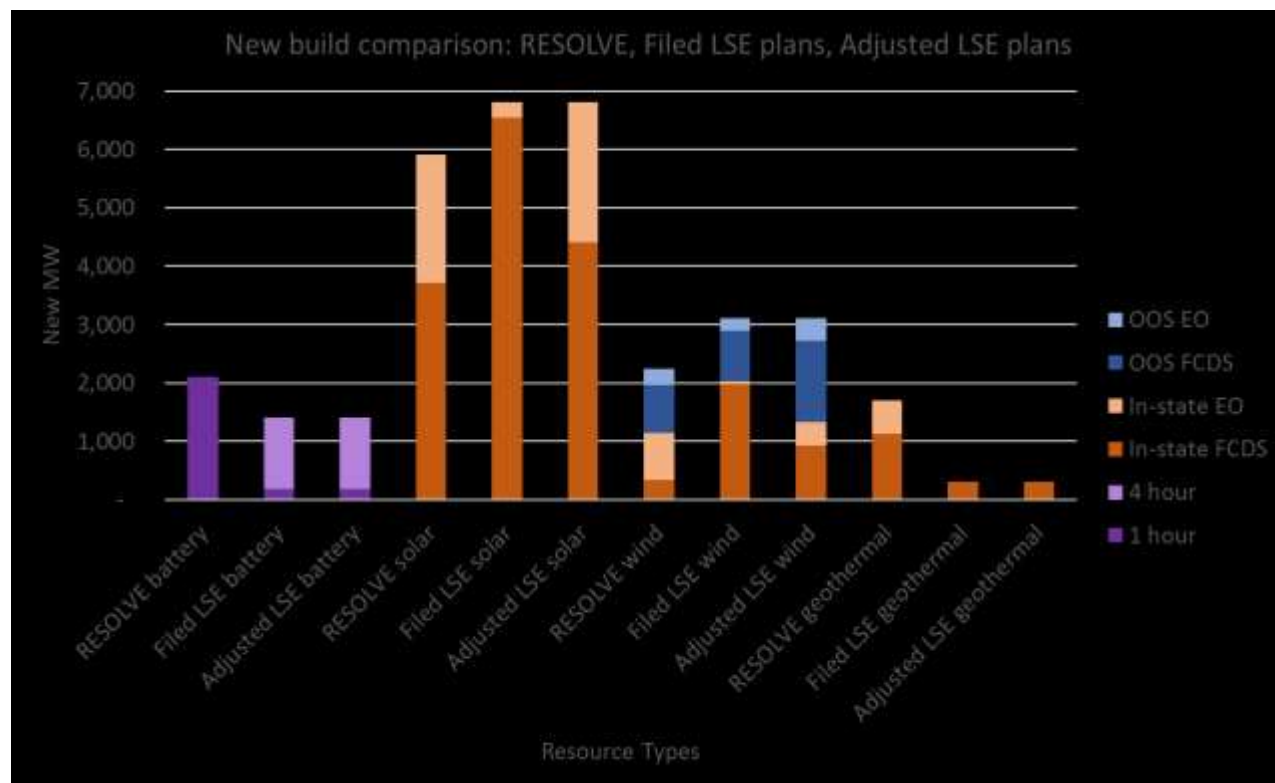
3.3. Discussion

The original recommendation by Commission staff that we adopt the HCP as the PSP, as articulated in the January 11, 2019 ALJ ruling, was focused on the desire to reflect the resource procurement preferences of individual LSEs in our future planning and the CAISO's transmission analysis. This is the first time we have had an indication of those LSE preferences that we were able to aggregate together into a total picture of what the system would look like should those choices come to fruition by 2030.

Though some parties take issue with the adjustments made by Commission staff, we find that they were reasonable in order to form a complete picture of the CAISO system and evaluate the resulting portfolio in 2030 further. In the future, we would prefer that Commission staff not have to make adjustments to the aggregated portfolio in order to construct a feasible portfolio.

However, in this instance it was necessary for analysis of a feasible portfolio. Figure 1 below shows the adjustments made to the LSEs' preferred renewable and storage resource choices compared to the results of RSP with 2017 IEPR assumptions from the RESOLVE model. Biomass and biogas resources are not shown in the table because no adjustments were made to those resource types. The relative mix of full capacity deliverability status (FCDS) vs. energy-only (EO) capacity was adjusted to accommodate transmission availability. These adjustments also preserved the total requested capacity by LSEs by resource type, to show those resource preferences.

Figure 1. 2030 New Renewable and Storage Resources in RSP with 2017 IEPR assumptions, Aggregated LSE IRPs, and Adjusted LSE IRPs



In order to avoid these types of manual adjustments in the future, one improvement we will make is to create stricter filing requirements for LSEs. In particular, in these first IRP filings, in many cases we were unable to distinguish between resources within an LSE's portfolio that represented existing contracts and resources that were generic aspirational choices for the future that may or may not be developed. Several parties, including many CCAs, acknowledged the tentative nature of their new generation choices and asked that the Commission not rely on those choices included in their plans for statewide planning purposes. Many of the CCAs also stated in their comments in response to the staff recommendation that their Conforming Plans, which Commission staff used as the basis for the portfolio aggregation for the entire CAISO system, were not representative of their resource preferences. Rather, those were

included in their Preferred Plans, which were not able to be aggregated by staff because the load forecasts used for these plans could not be added together to form a total CAISO system picture that aligns with the IEPR forecast.

Because of this uncertainty, in the next IRP filings we will require that individual LSEs disclose the contractual and development status of their resource choices. If need be, this information can be submitted confidentially. But in order for us to form an accurate picture of the CAISO system that would result from the individual IRPs being aggregated, we will require this information.

In order to improve and update the information included in the 2018 IRP filings, we will require that each LSE include the contractual status and the development status of each resource in an updated filing with Commission staff by no later than August 16, 2019. Commission staff will develop the exact data request format and template, and will also subsequently produce a public progress chart about the contractual and project status data submitted by LSEs.

Because the majority of new resources in California are expected to be acquired by CCAs in the next decade, this puts additional focus on their contributions to the IRP process. Very concerning overall is the attitude displayed by some CCAs with respect to the IRP process in general. Several CCAs asserted the primacy of their voluntary plans approved by their local governing boards over the Commission's IRP process, and argued that the Commission's IRP processes do not fit with their individual resource

procurement plans.⁹ This demonstrates the crux of the problem the State will face in coming years as more and more load is served by non-IOU, and specifically CCA, providers.

While local resource preferences may vary and should be respected to a degree, ultimately the electricity grid must operate as a system. With more than 40 entities (and counting), the Commission is charged with evaluating whether resource procurement by all of these entities collectively will result in a reliable and affordable electric system that meets the GHG emissions reduction requirements of state law and policy. While some amount of individual variation in resource choices may be able to be accommodated, the core of the system needs to balance in real time and function to deliver electricity over an integrated transmission and distribution grid, and thus there is an inherent balance that needs to be achieved to ensure reliability and renewable integration. By looking collectively at the resource choices of individual LSEs, the Commission is the only entity in the position to ensure an optimal portfolio that meets the environmental goals, while also allowing the electric system to operate reliably and at least cost to ratepayers. This is something that no individual LSE can achieve with its individual plan.

The critical issues are with respect to the mix of renewable resource types to be procured, as well as the resources to accomplish renewable integration. Overall, the CCAs have shown, in their individual IRPs collectively, a preference for solar and wind resources, as well as four-hour batteries, supplemented by

⁹ See, for example, the August 1, 2018 IRP filed by MCE, at 4-6, available at the following link: https://www.mcecleanenergy.org/wpcontent/uploads/2018/08/MCE_LSEStandardPlan_20180801.pdf.

imported hydroelectric power. However, to balance the system between now and 2030, the resource balance will need to include a mix of existing and new resources, a mix of baseload and intermittent resources, and a mix of renewable, storage, and conventional fossil-fueled resources. In analyzing the IRPs of all of the LSEs, there is inconsistent, and in some cases, nonexistent, recognition of these realities.

Meanwhile, we are faced with the question of whether to adopt the HCP as the PSP for purposes of future IRP cycles, any associated procurement actions, and the CAISO's transmission planning. We note that in addition to analysis conducted by Commission staff, modeling was also conducted by CAISO, SCE, and GridLiance.

In its comments filed January 31, 2019, Cal Advocates helpfully provided a table that shows an overview of the results of the modeling conducted to support a PSP recommendation not only by Commission staff, but also by SCE and CAISO. Table 2 below replicates the information provided in that summary table from Cal Advocates. The table shows emissions, reliability, renewable curtailment, operating cost estimates, and the RPS percentages results from each case analyzed.

Table 2. Cal Advocates Summary Table of Portfolios Modeled

Source	Case	CAISO GHG Emissions (MMT)	Meets Reliability (Y/N)	Renewable Curtailment (GWh)	Total Operating Costs (\$million)	RPS (%)
Staff	RSP with 2017 IEPR, RESOLVE	34	Y	2,923	4,605	60
	RSP with 2017 IEPR, SERVIM	38.2	Y	11,055	4,981	58.3
	HCP, SERVIM	42.7	Y	7,866	5,631	51.5
	HCP Calibrated LOLE, SERVIM	41.9	Y	7,124	5,880	51.8
SCE	RSP with 2017 IEPR, PLEXOS	34.2	Y	4,136	4,529	54.7
	RSP with 2017 IEPR, with Gas Retirement, PLEXOS	33.5	Y	3,836	4,453	54.9
	HCP, with Gas Retirement, PLEXOS	35.9	Y	4,157	4,760	51.4
CAISO	HCP, PLEXOS	38.55	N	3,332	2,866	51

Of most concern to us, based on the above results, is the fact that the HCP would, in each analysis provided, result in greater GHG emissions in 2030 than the RSP adopted last year, after 2017 IEPR assumption adjustments. Bluntly stated, the HCP would not result in emissions reductions consistent with the electricity sector GHG goals established by this Commission. Given that all of our planning efforts in this proceeding have been focused around achieving this

GHG goal, reliably and at least cost, the HCP would appear not to achieve those objectives.

Also important is the fact that although the HCP appears to be reliable in all analyses except the CAISO's, it is still likely less reliable than the RSP with 2017 IEPR adjustments. The HCP includes elements that tend to decrease reliability, relative to the resource mix in the RSP with 2017 IEPR adjustments. The HCP has longer duration batteries, but less capacity than the RSP with 2017 IEPR assumptions. Higher capacity is more valuable to providing reliability during the highest peak hours. The HCP also has less geothermal (firm, high-capacity-factor, low-carbon energy) than the RSP with 2017 IEPR assumptions. Resources like geothermal are more valuable for providing reliability over most hours of the year, given that a low-carbon portfolio necessarily includes intermittent resources like wind and solar.

The HCP also does not appear to come close to achieving the 60% RPS requirements in 2030.¹⁰ For all of these reasons, we conclude that the HCP should in no way be our "preferred" system portfolio for future planning. Thus, we will not adopt the HCP as the PSP.

This leaves us with the question of which portfolio we should adopt instead as the PSP. The first obvious option is to revert back to the RSP adopted in D.18-02-018, as adjusted with 2017 IEPR assumptions (the most recent assumptions available). However, the major shortcoming with the RSP was its treatment of existing natural gas-fired resources, since it assumed that all of

¹⁰ It should be noted that the individual IRPs were submitted prior to SB 100 becoming law.

those resources would be available in perpetuity. Many parties objected to this assumption as unreasonable and unrealistic; we agree.

Commission staff have proposed more in-depth analysis of the existing natural gas fleet in an ALJ ruling issued February 11, 2019 in this proceeding, for the next cycle of IRP. But in the meantime, SCE's modeling presented in their January 31, 2019 comments tested a portfolio similar to the RSP with 2017 IEPR assumptions, but including the assumption that fossil-fueled units retire after a 40-year-life.

A combination of SCE modeling and Commission staff analysis demonstrate that the RSP with 2017 IEPR assumptions and a 40-year fossil-fueled resource retirement assumption is a viable option for adoption as the PSP. Such a portfolio is likely reliable and will result in lower GHG emissions than the HCP.

On the issue of reliability, though such a portfolio was not run through a production cost model by Commission staff, the portfolio can be inferred to be reliable based on the following modeling results. First, in the September 24, 2018 ALJ ruling, Commission staff presented operational results from SERVIM for the RSP with the 2017 IEPR assumptions (though not including the 40-year retirement assumption), as well as additional reliability results also including fossil retirement well in excess of just a 40-year age-based retirement assumption (this was the "calibrated LOLE study" in that ruling). Given that these two scenarios resulted in acceptable reliability, it can be inferred that a study of the RSP, with 2017 IEPR assumptions and the 40-year age-based retirement assumption, would yield acceptable system reliability results.

In addition, in the workshop on January 7, 2019 and subsequent comments on January 31, 2019, SCE presented a PLEXOS model assessment of operational

and system reliability of the RSP with 2017 IEPR assumptions and a 40-year retirement assumption, demonstrating that this system would be operable and reliable at the system level.

Turning to the differences between the portfolios in terms of resource selection, there are several significant differences between the HCP and a portfolio based on the RSP, with 2017 IEPR assumptions and a 40-year fossil-fueled resource retirement assumption. Some of the notable differences in terms of new resources selected are the following:

- The HCP has less geothermal energy than the RSP with 2017 IEPR assumptions, resulting in less high capacity factor renewable energy.
- The HCP has more renewable capacity but produces less renewable energy than the RSP with 2017 IEPR assumptions, due to the particular resource selection by LSEs, which is contrary to environmental goals.
- The HCP contains longer duration batteries but less capacity overall than the RSP with 2017 IEPR assumptions.

Although these differences in the HCP seem largely to emanate from specific resource preferences of the LSEs, as indicated in their conforming portfolios, they are not necessarily the appropriate choices to serve the overall electricity system, from a reliability, environmental, or cost perspective. Thus, we still prefer the resource mix associated with the RSP adopted in D.18-02-018, as adjusted with the 2017 IEPR assumptions and the 40-year life assumption for fossil-fueled resources.

One other adjustment that Commission staff have made to all of the portfolios being discussed in this decision, subsequent to the analysis released in the January 11, 2019 ALJ ruling with PSP recommendations, is to incorporate updated information from the CAISO about transmission capability available to

interconnect new resources. The CAISO provided this updated information informally to Commission staff in January 2019. Commission staff used it to inform the final portfolios to be adopted for the PSP and recommended for study in the CAISO's 2019-20 TPP. Specifically, the updated information was used during the allocation of IRP portfolios to transmission substations (to facilitate power-flow analysis) and to re-optimize portfolio selection in the RESOLVE model (for the policy-driven sensitivity cases for analysis in the TPP only, discussed later in this decision).

The updated transmission capability information was based on results from the CAISO's Generation Interconnection Deliverability Allocation Procedures (GIDAP) studies and the CAISO's 2018-19 TPP studies. As part of the GIDAP studies, the CAISO conducts a detailed deliverability assessment of active generation in the CAISO's interconnection queue clusters. In each TPP study cycle, the CAISO conducts studies that assess whether transmission upgrades or other measures are needed to meet reliability standards, as well as address policy and economic considerations. Together, these studies provide estimates of the transmission capability available to interconnect new resources with full capacity deliverability status or energy-only deliverability status in various transmission-constrained areas in the CAISO-controlled grid, as well as the scope and cost estimates for conceptual upgrades to increase the estimated transmission capability in these areas.

GIDAP studies are the primary source for the estimation of transmission capability because the capacity amounts in the interconnection queue in most study areas tend to be higher than the amounts in the corresponding renewable zones in TPP portfolios. In addition, certain 2018-19 TPP study results were not available in time to be incorporated in the Commission's analysis to meet the

schedule for portfolio transmittal to the CAISO. Therefore, the CAISO relied predominantly on Queue Cluster 11 Phase I studies for most renewable zones. Prior queue cluster studies were utilized in a few renewable zones because the amount of capacity studied in each cluster varies and sometimes earlier clusters with larger amounts of capacity can expose constraints that may not show up in the later clusters.

We recognize that this new information came late in the process and was not included in the earlier analysis available for stakeholder vetting and commenting. This new transmission availability information could also have a material effect on the portfolio results in particular locations. This is an example of ongoing tension we face in this IRP process between the desire to utilize the most up-to-date technical information and the desire to have complete transparency in the process. While we are confident that the information provided by the CAISO is the most accurate and up-to-date technical information for this IRP round, we will endeavor in the future to minimize such late-stage updates to the analysis. In particular, we continue to work on aligning multi-agency processes so that we can minimize the need to introduce updates midstream, and instead utilize one vintage of data all the way through the analysis and conclusion of each planning cycle.

After incorporating the new transmission availability information from the CAISO, and considering the options available to use as the PSP, we elect to adopt a modified version of the Reference System Portfolio, utilizing the 2017 IEPR assumptions and a 40-year life for fossil-fueled resources, as a proxy for potential retirements, until better information becomes available in the next cycle of the IRP process. As stated above, our two main reasons are the uncertainty associated with the resource choices included in individual LSE IRPs, which may

or may not be reflective of reality, and the need for the Commission to adopt an optimized portfolio that balances the environmental, reliability, and cost characteristics across the entire electric system – something that no individual LSE can achieve on its own.

Table 3 below details the different new buildout results for renewables and storage of the various portfolios analyzed. In addition to new resource buildout, the table also shows the breakout of deliverability status (FCDS vs. EO) for the resources in order to highlight the differences between portfolios. The last three columns illustrate the staff adjustments to the relative mix of FCDS vs. EO for the RSP with 2017 IEPR assumptions, to accommodate the new transmission availability information provided by the CAISO in January 2019.

Table 3. Comparison of New Renewable and Storage Buildout in 2030 with Different PSP Options

Resource Type	Hybrid Conforming Portfolio (MW)			RSP with 2017 IEPR (MW)			RSP with 2017 IEPR and transmission availability updates (MW)		
	FCDS +EO	FCDS	EO	FCDS +EO	FCDS	EO	FCDS +EO	FCDS	EO
Lithium Battery, about 1 hour	90	90	-	2,104	2,104	-	2,104	2,104	-
Lithium Battery, about 4 hours	1,065	1,065	-	-	-	-	-	-	-
Solar	6,807	4,412	2,396	5,916	3,712	2,204	5,916	2,709	3,207
In-State Wind	1,329	917	412	1,145	341	803	1,145	341	803
Out-of-State Wind	1,773	1,399	375	1,101	821	281	1,101	1,101	

Resource Type	Hybrid Conforming Portfolio (MW)			RSP with 2017 IEPR (MW)			RSP with 2017 IEPR and transmission availability updates (MW)		
	FCDS +EO	FCDS	EO	FCDS +EO	FCDS	EO	FCDS +EO	FCDS	EO
Total Wind	3,102	2,316	787	2,246	1,162	1,084	2,246	1,443	803
Geothermal	310	310	-	1,700	1,132	568	1,700	1,048	652
Biomass	163	7	156	-	-	-	-	-	-
Total New Renewables	10,382	7,044	3,338	9,862	6,005	3,856	9,862	5,200	4,662
Total New Renewables and Storage	11,537	8,199	3,338	11,966	8,110	3,856	11,966	7,304	4,662

Figure 2 below shows a more simplified graphical representation of the new resources required to be built to achieve the PSP we are adopting herein.

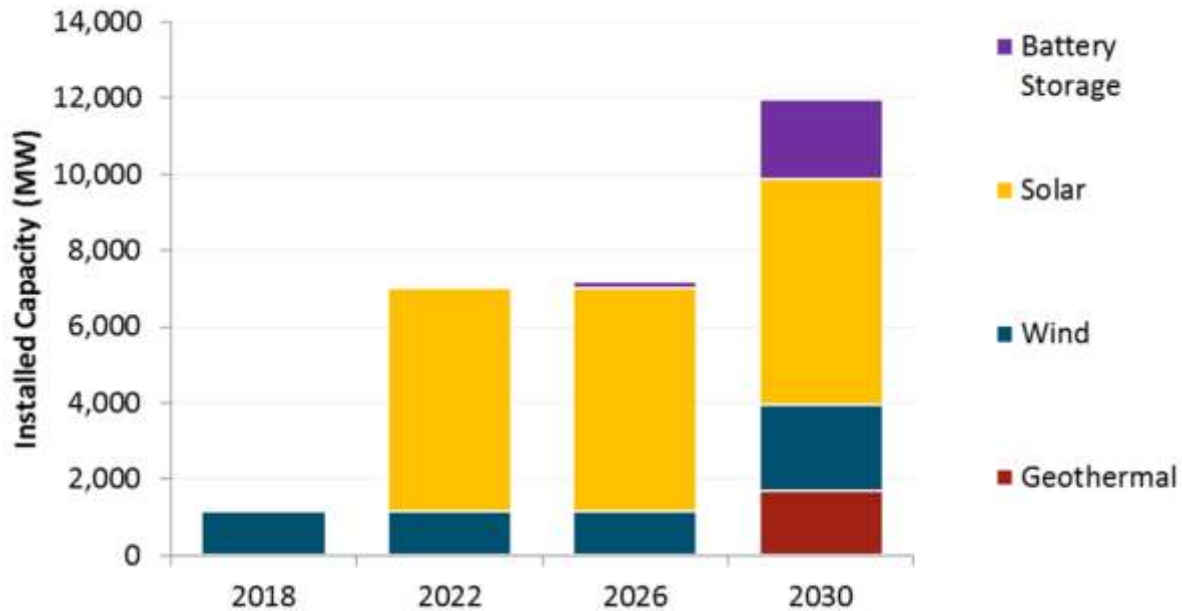
Figure 2. New Resource Buildout Requirements for Preferred System Portfolio

Table 4 below is an illustrative comparison of the total resource portfolios that we considered, including new and existing resources, that would be required in 2030. In order to produce this comparison, Commission staff implemented an approximation¹¹ of the 40-year retirement assumption in RESOLVE (not SERVUM) and reoptimized¹² the RSP with 2017 IEPR assumptions. This provided an apples-to-apples basis for comparing total existing plus new

¹¹ The analysis was only an approximation in RESOLVE because existing contract information was not used to extend the life of resources that still had contracts in place at age 40. SERVUM modeling, on the other hand, used this contract information and therefore implementation of the 40-year lifetime assumptions in SERVUM resulted in moderately less total retirement.

¹² Inclusion of the 40-year lifetime assumptions as a RESOLVE input resulted in a moderately reoptimized new build, hence the small differences in mix of renewables and storage for the two RSP cases compared in Table 4.

resource portfolios and their corresponding operational metrics within the same model. As reported by RESOLVE, the RSP with 2017 IEPR assumptions and a 40-year life for fossil-fueled resources assumption had 2030 CAISO area emissions of 34 MMT while the HCP had emissions of almost 38 MMT, a definitive increase. The table below is indicative of the reasons why we choose to adopt the RSP, with 2017 IEPR assumptions and 40-year lifetime assumption, as the PSP.

Table 4. Total CAISO Resource Capacity Summary, including Baseline and New Resources, in 2030, in MW, using RESOLVE model

Total Resource Summary (New and Existing)	HCP	RSP with 2017 IEPR assumptions	RSP with 2017 IEPR and 40-year fossil life
Nuclear	622	622	622
Combined Heat and Power	446	1,685	446
Natural Gas	23,536	25,877	23,536
Hydro (large)	7,844	7,844	7,844
Biomass	916	725	725
Geothermal	1,577	2,920	2,894
Hydro (small)	466	466	466
Wind	11,292	10,439	9,482
Solar	19,662	18,766	19,030
Customer Solar	19,992	19,992	19,992
Battery Storage	2,729	3,429	3,235
Pumped Storage	1,832	1,832	1,832
Shed Demand Response	1,752	1,752	1,752

As the table above shows, the main differences between the HCP and the portfolio we are adopting as the PSP (the RSP, with 2017 IEPR assumptions and a

40-year fossil-fueled resource age limit) are in the amounts of wind, solar, and geothermal generation, as well as battery storage.

As stated above, but worth reiterating, considering the totality of modeling results presented thus far, the RSP with the 2017 IEPR assumptions and 40-year lifetime assumption for fossil resources achieves a more reliable and lower GHG emissions system than the HCP representing the aggregation of individual LSE IRPs.

4. Portfolios for Use in CAISO TPP

4.1. Staff Proposal

Included in the January 11, 2019 ALJ ruling was a staff recommendation for the portfolios to be used by the CAISO in its 2019-20 TPP. In accordance with a May 2010 memorandum of understanding between the CAISO and the Commission, and in coordination with the CEC, the Commission develops the resource portfolios to be used by the CAISO in its annual TPP. The Commission typically transmits to the CAISO multiple distinct portfolios developed through its IRP (or previously, its LTPP) process. Portfolios include:

- A “reliability base case” portfolio (transmission solutions identified are considered Category 1 under the CAISO tariff and go to the CAISO Board of Governors for approval)
- A “policy-driven base case” portfolio (transmission solutions identified are also considered Category 1 under the CAISO tariff and go to the CAISO Board of Governors for approval)
- “Policy-driven sensitivity case” portfolio(s) (transmission solutions identified are generally considered Category 2 under the CAISO tariff and generally do not go to the CAISO Board of Governors for approval, except under special circumstances).

The January 11, 2019 ALJ ruling included the staff recommendation that the HCP be used as both the “reliability base case” and the “policy-driven base case” for purposes of the CAISO’s 2019-2020 TPP.

For the “policy-driven sensitivity” portfolios, the January 11, 2019 ruling included two recommended portfolios to be studied, both constrained at the 32 MMT of GHG emissions level statewide, in order to test the transmission implications of these more aggressive GHG-reducing portfolios. One of the portfolios assumes a large amount of in-state development of renewable resources, while the other portfolio assumes more imported renewables, primarily from Wyoming and New Mexico wind resources. These two portfolios, designed using the RESOLVE model, would allow the CAISO to test the distinct transmission needs of the two portfolios. Another portfolio was studied that included unconstrained out-of-state renewables, but was not recommended by staff because it would not be able to leverage the geographical locations of interregional transmission projects that have already been proposed, as well as due to the significantly higher cost and resource potential uncertainties for very large amounts of out-of-state renewables. The case recommended for study reflects transmission commercial interest delivering wind resources from Wyoming and Mexico to California.

As mentioned in Section 3 above, the CAISO recently provided updated data on transmission availability by transmission area to Commission staff, gleaned from their 2018-19 TPP process. This data also includes transmission upgrade size and cost assumptions to increase capacity in certain areas.

4.2. Comments of Parties

Similar to comments on the appropriateness of the HCP to form the basis of the PSP, parties were split on whether the HCP should be used as the

reliability and policy base cases. Parties supporting the use of the HCP as the base cases included CAISO, Calpine, PG&E, SDG&E, GridLiance, the Joint CCAs, POC, SDCWA, and TransWest. Although the CAISO recommended using the HCP, they noted that if transmission needs are identified, stakeholder feedback could be used to identify resource retention or replacement options to avoid transmission improvements.

Parties recommending against the use of the HCP as a reliability base case included AWEA, CEERT, SCE, Reid, Cal Advocates, Hell's Kitchen, CEJA and Sierra Club. AWEA argued that the HCP is unlikely to lead to new transmission, and high capacity factor resources will not be able to move forward without new transmission. CEERT, ED, and NRG objected because the portfolio does not meet the GHG emissions target, hindering progress toward state goals. GPI, TURN, and Cal Advocates were concerned that LSE procurement will differ significantly from the HCP, leading to stranded transmission assets. Cal Advocates therefore argued that the Commission should not submit any base case, and TURN advocated that the HCP never be used to support transmission investments. SCE also pointed out that a number of LSEs cautioned the Commission again using their plans for planning such as the TPP.

CEERT, SCE, CEJA and Sierra Club, and Reid recommended that the RSP with the 2017 IEPR assumptions be used as the reliability base case.

The majority of commenting parties also opposed using a different portfolio than the one adopted as the PSP for purposes of transmission planning, including PG&E, CAISO, SCE, Calpine, CESA, GPI, GridLiance, and WPTF.

Turning to the policy-driven sensitivity portfolios, a number of parties supported the staff recommendation to examine two distinct portfolios testing the transmission needs of a portfolio with heavy in-state renewables and one

with more renewable development outside of California, especially New Mexico and Wyoming. Parties supporting testing of both portfolios included CAISO, Calpine, CEJA and Sierra Club, GPI, Cal Advocates, SCE, TransWest, and NRG.

Some parties preferred that the Commission only forward the in-state renewable portfolio for sensitivity study, including POC and SWPG. Some parties would have preferred that the CAISO study the more unconstrained out-of-state renewable development case not recommended by staff, including AWEA, Reid, and TransWest.

Finally, GridLiance, Hell's Kitchen, and LS Power expressed concerns with either of the cases being studied in the CAISO process, with GridLiance primarily objecting due to the limited opportunity to vet the cases with stakeholders.

4.3. Discussion

We agree with the majority of parties who argued that the reliability base case and policy-driven base case should be the same and should also reflect the Commission's adoption of the PSP. Thus, we recommend that the CAISO utilize the PSP adopted in this decision as the reliability base case and the policy-driven base case in its 2019-20 TPP. This is the PSP that is based on our RSP from this cycle of IRP, but also including the updated 2017 IEPR assumptions and the 40-year lifetime assumption for fossil-fueled thermal resources (where units with contracts still in place at age 40 defer retirement until the end of the contract), plus the transmission availability adjustments emanating from the CAISO's preliminary analysis in its 2018-19 TPP.

In order to make the PSP usable for the CAISO as a reliability and policy-driven base case, Commission staff have updated the portfolio based on recently available CAISO information from its 2018-19 TPP on transmission

availability, along with upgrade size and cost assumptions, as mentioned above. This new data was reconciled with the portfolio from the RSP with 2017 IEPR assumptions to ensure that the RESOLVE-selected resources for each transmission planning area fit within the available space. To the extent possible, new geothermal and wind resources were changed to be fully deliverable since these are higher capacity value resources that would typically bid into resource solicitations as providing resource adequacy. RESOLVE under earlier assumptions did not find a need for new capacity and thus sometimes selected new geothermal and wind as energy-only resources.

The final portfolio to be studied in the CAISO's TPP also required allocating the resources to specific substations on the CAISO transmission grid to facilitate power flow analysis. The final portfolio is posted on the Commission's web site at: <http://www.cpuc.ca.gov/General.aspx?id=6442460548>.

The final allocation of the geographically-coarse resources in the RSP with the 2017 IEPR assumptions to substations on the CAISO-controlled transmission grid was conducted by land-use experts at the CEC. This allocation also satisfies the recent updates to the available transmission capacity provided by the CAISO. The allocation is available on the CEC's website at: <https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=17-MISC-03>.

For purposes of the policy-driven sensitivity cases, we agree with the staff recommendation that it will be wise to study a heavily in-state renewable development future, as well as one based on reliance on out-of-state wind, primarily in Wyoming and New Mexico. This should help us to understand the total cost tradeoffs inherent in these resource choices. Because these policy-driven sensitivity cases are not likely to result in near-term transmission

investment, it is appropriate to study these now, to better inform future planning efforts without incurring significant investments now.

In order to facilitate CAISO review of these two recommended cases, Commission staff updated the portfolios to be studied utilizing the most recent TPP results from the CAISO on transmission availability, as well as upgrade size and cost assumptions. Commission staff then reran the RESOLVE model utilizing this new version, and adding the 40-year life assumptions for fossil-fueled resources, to produce updated portfolios. Overall, the resource mix changed very little. However, the mix of in-state new resources by transmission planning area changed moderately. Some geographic areas had increased space available on the transmission system and some had decreased space available. Overall transmission availability encompassing two or more regions also constrained the amount of new resources that could be built within individual areas and groups of areas.

Changes in upgrade size and costs also caused RESOLVE to shift its choices for in-state build between transmission planning areas. Significantly lower cost upgrades in certain areas caused RESOLVE to trigger in-state transmission upgrades to access higher-value renewables within those areas (an additional 1,570 MW in Westlands in the in-state-development-focused case, and an additional 654 MW in Greater Carrizo in both cases).

To the extent possible, new geothermal and wind resources were changed to be fully deliverable since these are higher capacity value resources that would typically bid into resource solicitations as providing resource adequacy capacity.

The final portfolios to be studied by the CAISO require allocation to specific substations. The CEC land-use staff did this mapping for the policy-driven sensitivity cases, just like the base cases.

The portfolios for the policy-driven sensitivity cases to be studied by the CAISO in the 2019-20 TPP are summarized in Table 5 below.

Table 5. Deliverable and Energy-Only Nameplate Capacity by Resource Type in 2030, in MW

Resource Type	Policy Sensitivity #1 (allows out-of-state new build on existing transmission only)			Policy Sensitivity #2 (allows up to 4,250 MW of new out-of-state wind on new transmission)		
	Total	FCDS	EO	Total	FCDS	EO
Battery, about 2 hour	-	-	-	2,602	2,602	-
Battery, about 4 hour	4,347	4,347	-	-	-	-
Pumped Storage Hydro	1,342	1,342	-	-	-	-
Solar	11,588	3,952	7,636	6,220	2,004	4,216
In-State Wind	2,775	2,512	262	2,333	2,070	262
Out-of-state wind	2,000	1,466	534	6,250	2,273	3,977
Total Wind	4,775	3,978	797	8,583	4,344	4,239
Geothermal	2,020	1,368	652	2,020	1,368	652
Total New Renewables	18,383	9,298	9,085	16,823	7,716	9,107
Total New Renewables and Storage	24,071	14,987	9,085	19,425	10,318	9,107

The recommended portfolio information has already been transmitted by Commission staff to the CAISO because of the timing of the TPP process. This decision serves as an affirmation of the recommendations already forwarded to the CAISO by Commission staff. In future IRP cycles, we intend to have this decision on the PSP rendered earlier, so that the full Commission has time to consider the TPP recommendations before the study cycle begins.

Table 6 below contains a summary of the key new resource costs, operational metrics, and components of the three portfolios recommended to be studied by the CAISO in the 2019-20 TPP. These metrics were all produced by the RESOLVE model.

Table 6. Portfolios Recommended to be Studied by the CAISO in the 2019-20 TPP: New Resource Mix and Cost Estimates, in 2030

Item	Reliability and Policy-Driven Base Case	Policy Sensitivity #1	Policy Sensitivity #2
Portfolio Costs (inclusive of any selected transmission upgrades) in 2016 \$MM			
New fixed costs	2,584	5,097	4,808
Operating costs	4,605	3,615	3,589
Total Costs ¹³	7,189	8,712	8,397
Actual RPS percent, including estimated REC bank usage	60%	71%	71%
Total Nameplate MW by resource type			
Li Battery, about 1 hour	2,104	-	-
Li Battery, about 2 hour	-	-	2,602
Li Battery, about 4 hour	-	4,347	-
Pumped Storage Hydro	-	1,342	-
Solar	5,916	11,588	6,220
In-state Wind	1,145	2,775	2,333
Out-of-state Wind	1,101	2,000	6,250
Total Wind	2,246	4,775	8,583

¹³ Total Costs here is the sum of new fixed costs from resources and transmission upgrades, as well as operating costs. It does not include other baseline costs that are the same across all portfolios.

Item	Reliability and Policy-Driven Base Case	Policy Sensitivity #1	Policy Sensitivity #2
Geothermal	1,700	2,020	2,020
Total New Renewables	9,862	18,383	16,823
Total New Renewables and Storage	11,996	24,071	19,425

5. Near-Term Actions to Achieve the Preferred System Portfolio

In response to the January 11, 2019 ALJ ruling containing recommendations about the PSP and portfolios to be used for CAISO TPP, parties were asked to respond to questions about any policy or procurement actions that the Commission should take, or potentially require the LSEs to take, in the short term, to achieve the preferred portfolio. In D.18-02-018, this portion of the inquiry was referred to as the Preferred System Plan. This section addresses the “Plan” portion of this two-part structure, with the other part being the portfolio already discussed above in Section 3 of this decision.

In addition, an Assigned Commissioner and ALJ Ruling was issued on November 16, 2018 on the subject of near- and medium-term reliability issues, posing questions about the adequacy of our mechanisms to deal with the reliability-related aspects of the IRP process, as distinct from the GHG emissions outcomes. The November 16, 2018 ruling specifically referred to comments filed in September 2018 in response to the individual IRPs by SCE and CLECA. These comments raised ideas about what the Commission should do in the event of a reliability challenge. SCE proposed a “trigger” mechanism that would authorize reliability-based procurement if certain conditions are met, with emphasis on acquisition of storage resources.

The November 16, 2018 ruling noted that reliability concerns have been emerging more frequently in various venues, including the Commission's Customer Choice Project, as well as reports of the CAISO DMM. Finally, the ruling posed a series of questions to solicit input on potential ways to address the concerns. In particular, the ruling noted issues related to the difficulty of planning for reliability constraints when the proliferation of new LSEs with diffuse responsibility for maintaining grid reliability.

5.1. Comments of Parties on Potential Actions to Achieve the PSP

In response to the January 11, 2019 ALJ ruling, the majority of parties commented that no specific procurement should be ordered as a result of the analysis of the individual LSE IRPs or the HCP. Those parties included AEE, AReM, Cal Advocates, Calpine Corporation, CAISO, the Joint CCAs, SCE, SDG&E, PG&E, TransWest, TURN, and WPTF. Most parties also commented that an increase in RPS compliance requirements also was not warranted.

A few parties felt that specific procurement should be ordered, including CESA, SDCWA, Wellhead, and GridLiance. Ormat suggested that the Commission order IOU procurement, and be advisory on CCA and ESP procurement.

Cal Advocates suggested that the Commission begin considering additional procurement-related questions, such as who should procure, how much, the types of resources, and the allocation of benefits. GridLiance suggested that the Commission require LSEs to report procurement progress towards their plans.

Several parties also suggested modeling improvements as near-term actions. AReM would like more granularity and verification of Commission staff

analyses. Calpine also wanted more analysis of discrepancies between results of various modeling parties. PG&E, Cal Advocates, CESA, NRG, and WPTF suggested further alignment between the three models commonly utilized (RESOLVE, SERVUM, and PLEXOS). PG&E also suggested checking for resource adequacy compliance and optimization of distributed energy resources. LS Power and TransWest suggested improvements to the out-of-state wind and transmission assumptions and costs.

SCE and PG&E focused attention on the need to study potential retirements of thermal generation resources. Finally, PG&E also suggested increased attention to process alignment between the CAISO, CEC, and this Commission.

5.2. Comments of Parties on Near- and Medium-Term Reliability Issues

The majority of parties in this proceeding commented in response to the November 16, 2018 Joint Assigned Commissioner and ALJ Ruling on reliability issues. The responses fell into several categories or themes as summarized below.

First, many parties felt that the resource adequacy requirements of the Commission and/or the resource adequacy proceeding are a better venue for addressing these types of reliability concerns than the IRP proceeding. Parties making comments along these lines included: AReM, CalCCA, GPI, LS Power, and WPTF.

Other parties felt that both the RA and the IRP proceedings need to address different aspects of the issues. CESA, NRG, SDCWA, SDG&E, SCE, and UCS were particularly in favor of shared responsibility between the proceedings, focusing on the different time horizons and different emphasis on existing vs.

new resources. UCS argued that the resource adequacy proceeding should focus on retention of gas resources, while IRP should focus on the development of new non-fossil-fueled alternatives.

TURN, on the other hand, argued that the IRP proceeding is the only place that the Commission looks comprehensively at all of these issues, and that resource adequacy is narrowly focused on short-term reliability. PG&E and SCE also felt that the IRP needs to address reliability issues on the sooner end, and that the current focus on GHG emissions targets will miss the system reliability aspects unless it is augmented, in coordination with CAISO reliability studies. They argued that analysis done so far in IRP is inadequate to handle reliability issues. PG&E also pointed out that the reliability assessment available in SERVM can look at resource adequacy, but not operational reliability issues.

Shell Energy was also in favor of the Commission addressing all of these reliability issues in the IRP proceeding, stating that an integrated look is the only way to solve these issues and that stakeholders should not have to participate in multiple venues in order to address one set of issues.

SCE also agreed that IRP is the venue for addressing these broad reliability issues. They made the general point that wholesale energy markets function best when there is excess capacity and/or free entry in the market, and argued that California's market increasingly possesses neither of these attributes.

CESA was in favor of SCE's proposed trigger mechanism, designed to initiate procurement, especially in key local areas, when certain reliability thresholds are met. CESA pointed out that storage resources have been used to meet these types of needs in the past, including for recent procurements in the Moss Landing, Aliso Canyon, and Metcalf areas.

Several parties also used this response opportunity to argue again for the development of a centralized capacity market in California. Parties reiterating this point included: AReM, IEP, WPTF, and Shell, with Shell emphasizing that a market design could be crafted that is less like a Federal-style capacity market and more styled on the Electric Reliability Council of Texas model.

The majority of parties felt that there is not a looming crisis of reliability, and the Commission has time to consider these issues and craft solutions. Those parties included CalCCA, CAISO, Calpine Corporation, GPI, POC, and TURN.

TURN did, however, suggest that a “Year 3 check” be added to the IRP process, to have Commission staff analyses, potentially in coordination with other agencies, look specifically at reliability in Year 3 of the planning horizon, to see if expenditure of additional ratepayer resources is necessary in each cycle of IRP.

A few parties are more concerned in the near term, including CESA, LS Power, National Grid, NRG, and the large IOUs. Issues discussed included the potential for more retirement of natural gas facilities needed in local areas, potential for minimization of access to the Aliso Canyon natural gas storage facility, multi-hour, hourly, and sub-hourly flexibility needs, smart approaches to overgeneration and curtailment, and faster-than-expected potential for electrification of transportation and/or buildings.

Some parties, including the CAISO, CLECA, Calpine Corporation, and WPTF expressed concerns about the dwindling availability of imported power and its potential implications for electric system reliability. CAISO also agreed with the point included in the ruling that there are no system-level market power mitigation mechanisms in their markets and that this is an area for future work.

The CAISO DMM also commented and pointed out that there should be closer coordination between the Commission and the CAISO on reliability-must-run (RMR) solutions. They also noted that the RMR and capacity procurement mechanism are flawed but are in the process of being revised to be improved. EDF also commented about the improvements that are in process or needed to the CAISO markets to enhance participation of certain types of resources. LS Power and CESA, to some degree, focused on the need for refinement to the CAISO Flexible Capacity Framework proposal to deal with shorter duration flexibility needs. UniGen was focused on use of the day-ahead schedule to improve reliability.

SCE also commented that the CAISO markets need improvement to handle the rapidly changing electricity market in California. SCE expects this evolution to occur naturally and by necessity, through coordination among agencies and entities. SCE's main focus is on the state more clearly defining its policy path in order to have all markets evolve in the right direction.

Meanwhile, the majority of parties, including CLECA, AReM and many others, concluded that there are not major structural problems with the CAISO markets.

Some parties were also focused on the need to emphasize renewable integration resources, including CEERT, CEJA and Sierra Club, First Solar, Hydrostor, National Grid, Eagle Crest, and UniGen.

First Solar was specifically focused on the issue of taking advantage of the additional flexible capabilities of renewable resources, and not just natural gas. Meanwhile, Hydrostor, National Grid, Eagle Crest, and SDCWA focused most of their comments on the importance of long-duration storage, particular pumped hydro storage.

Powerex pointed out that there is a great deal of available hydro capacity in the Northwest ready to meet California' renewable integration needs, but that the current rules of resource adequacy discourage forward capacity procurement and need to be reformed.

Some parties would prefer that the Commission order additional procurement in the near-term due to a perceived need for reliability resources, including CESA and IEP.

Wellhead's comments focused on the need to consider "hybridizing" some existing natural gas resources with storage technology to reduce GHG emissions. WEM was focused on the potential reliability effects of early retirement of Diablo Canyon.

Some parties commented on the importance of the rise of distributed energy resources, as well as the likely need for additional reliability resources to serve load associated with electrification of buildings and transportation. These parties include EDF and Vote Solar.

Several parties are also concerned that there has been inadequate focus on the planning for natural gas retirements, including all of the large IOUs, WPTF, and many of the parties with natural gas generation resources to offer.

Additional parties focused on the issue of having so many more LSEs now than historically. EDF pointed out that some solutions are fractional contracting and centralized buyers for reliability resources. Eagle Crest, SDG&E, and TURN reiterated earlier comments about the potential to develop a joint procurement authority or centralized procurement entity to allow multiple smaller LSEs to join together to procure large resources. However, Eagle Crest is skeptical that such an arrangement could be worked out in the timeframe available given the need to procure resources soon. Many parties commented that the central buyer

mechanism under consideration in the resource adequacy proceeding is not the type of approach they would recommend. SDG&E also notes that it is only for local reliability anyway, and the IRP consideration is more comprehensive than that.

5.3. Discussion

To address the question of appropriate actions to take in light of the PSP, as well as the reliability-related issues, we begin by stating affirmatively that we view the IRP proceeding as more than just an advisory planning exercise. While the first cycle of IRP has been mostly focused on ensuring that we have a framework set up and functioning to regularly assess the state of our electricity market, it is intended as the venue for both planning and for any procurement that should emanate from the analysis conducted during planning. Just because procurement has not been ordered during the first cycle should not be interpreted to mean that procurement need will not be identified nor that procurement will never be required out of this docket or subsequent IRP proceedings.

In addition, the IRP process, while focused on meeting the state's GHG emissions goals, is intended to do so in a way that is reliable and least cost. Neither reliability nor cost is an afterthought or secondary to the environmental goals. Rather, they are coequal and integral to a successful IRP process.

It should also be noted that while the first IRP cycle took longer to get up and running than we hope will be the case in the future, IRP is and was always designed to conduct checks on resource needs, reliability needs, and costs, at periodic intervals throughout the planning horizon. For example, the first RSP included in D.18-02-018 conducted analysis for 2022, 2026, and 2030. It continues

to be our intention to focus the planning at periodic selected intervals during the IRP planning horizon.

Some parties argued that the IRP is focused on new resource needs that are clean and renewable. While that is an important leading aspect and has received the most attention to date, the IRP analysis also includes the necessity of procuring and supporting resources that are required for a reliable and cost-effective electricity system, regardless of fuel source. IRP is focused on all types of resources, both on the supply and demand side.

In D.18-02-018, the Commission clearly found that while no *new* natural gas-fired power plants are identified in the 2030 new resource mix, the modeling also shows that *existing* gas-fired plants are needed in 2030 as operable and operating resources, providing a renewable integration service. It is possible that there are fewer gas-fired resources needed between now and 2030, but there are certainly some, based on our analysis to date. Eliminating natural gas-fueled resources altogether by 2030, while maintaining reliability, would require technological solutions well beyond any of those that have been surfaced or analyzed in this proceeding to date.

In addition, a number of parties commented that the IRP is focused on new resource needs. While that is a part of the IRP analysis, comments received in the initial cycle lead us to conclude that we need to put more emphasis on analysis focused on existing resources needed for reliability and their economic viability, particularly natural gas resources.

While the resource adequacy proceeding addresses planning reserve margins one year ahead, and now has a three-year procurement requirement for local resources, it currently does not provide a comprehensive look at all of the operational resource needs across all time periods addressed by the IRP process.

Thus, we conclude that the IRP proceeding is the only venue we currently have for addressing these types of resource questions, and we intend to use it for this purpose going forward. It is likely that with each IRP cycle, there will be different emphasis, depending on the needs of the electric system at the time. While our first cycle has largely focused on the need for planning to meet the GHG target in 2030, we expect our emphasis to shift in the next cycle. To this point, the ALJ ruling proposing scenarios for use in the 2019-2020 IRP cycle issued on February 11, 2019 laid out the more extensive natural gas fleet study that we will undertake in the next IRP cycle.

Next, we tend to agree with those parties who argue that there is not a fundamental problem in the CAISO market design or structure and that rather, the market designs will evolve as the products and activities of market participants shift. Thus, we do not make any suggestions here about CAISO market issues. We expect to remain active in coordination with the CAISO's stakeholder processes related to any changes they propose to their market rules.

We do agree that we should be concerned about the dynamics related to reliance on imports, including Northwest hydro. There are a host of issues associated with imports, and thus the next cycle of IRP will consider different ways to test additional assumptions about import availability. There are also potential resource shuffling concerns, as noted earlier in this decision.

Thus, we focus here on additional actions that the Commission can take to ensure that the LSEs are on a course to procure resources to realize the preferred system portfolio by 2030, as well as to address identified challenges related to reliability.

As we have noted before, because of load migration primarily away from IOUs to CCAs, we expect that the majority of procurement of new resources in

the next decade will be conducted by CCAs. We are aware that several CCAs are beginning to procure new resources, primarily renewables and storage,¹⁴ in order to achieve the ambitious GHG goals for 2030. However, the amount of new resource procurement will need to be roughly twice what the CCAs have procured to date by 2022, and close to six times as much by 2030. These are ambitious goals that require a lot of concrete contracting in order to secure the resources necessary.

It is not yet clear to us if it is feasible to rely on the CCAs for this level of procurement to achieve the 2030 portfolio. For example, the median project size so far being reported by CalCCA is approximately 1.75 MW; the average size is not much larger. At that level of contract size, it would take almost 6,000 individual contracts to reach the 2030 new resource goals to achieve the optimal portfolio. This seems to be a serious challenge. We encourage CalCCA or another appropriate organization to facilitate an exchange of expertise among the CCAs to ensure that all organizations are as prepared for this procurement challenge as possible. These types of concerns are also, in part, why it is so critical that we receive more explicit information from all LSEs, including CCAs, about the status of contracts and development of new resources, as soon as possible.

In addition, in the course of this analysis, it has become clear how important the RPS program will be in helping to achieve the optimal electric system portfolio by 2030. While all LSEs have an RPS obligation, and presumably

¹⁴ See, for example, CalCCA's listing of projects under development, available here: <https://cal-cca.org/wp-content/uploads/2018/11/CCA-Renewable-Energy-Map-web-1.pdf>.

are planning to comply with the RPS requirements, it will become increasingly important to ensure alignment between the RPS obligations and the optimal portfolio analysis emerging from the IRP process, designed to reach the GHG goals for the electricity sector. To date, much of the RPS procurement has been for wind and solar resources, but to the extent that renewable resource diversity is found to help achieve the optimal IRP portfolio (the PSP) at lower cost and in a more reliable manner, the RPS program may need to be adapted to take these considerations into account, or to effectively utilize the “least-cost, best-fit” requirements of RPS for purposes of the IRP goals. Beginning with this decision, we will undertake an even closer coordination with the RPS program to ensure that RPS requirements and compliance are aligned with achieving the optimal PSP identified in this decision.

We also wish to make clear to all LSEs that there is a shared responsibility among all of them for a reliable electric system that meets the state’s environmental goals at least cost. The Commission made this point clearly in the recent resource adequacy decision refining the program for local capacity needs.¹⁵ The current market trends appear to show that a large proportion of the responsibility for operational needs still rests on the large IOUs, despite the fact that resource adequacy requirements apply to all LSEs now serving customers. While the IOU customers have historically shouldered the burden of reliability resources, particularly natural gas, the load is departing rapidly for alternative providers, particularly CCAs, and the responsibility has not appeared to shift

¹⁵ See D.19-02-022.

proportionately. The IRP filings of the majority of CCAs are focused primarily, if not exclusively, on the acquisition of renewable and storage resources.

While that is admirable and necessary, it is also the case that even by 2030, if we meet our GHG emissions goals, the need for natural gas resources to help support system reliability will not be reduced to zero. While we are focused on minimizing the operation of fossil-fueled resources to the extent possible, especially in disadvantaged communities, there will still be the need to contract with existing natural gas resources needed to maintain system reliability as well as affordable electricity in the state while this broader transition is underway. And that responsibility needs to be shared fairly among all of the LSEs serving load within the CAISO. It will not be sufficient or appropriate for new CCAs to lean on these resources procured by IOUs, and provide the public with messages about their cleaner resource mix, while focusing their resource procurement efforts only on renewable and storage resources.

We also note that Senate Bill (SB) 350 specifically gave the Commission the authority to require CCAs to procure, via long-term contracts, renewable integration resources.¹⁶ At this moment in time, every resource that requires procuring or retaining, including the renewables themselves, is being used for renewable integration, since renewables are becoming the dominant resources in the electric system. While it may be the case that every single individual generation plant on the system currently is not needed for renewable integration, it is still the case that every *type* of resource on the system is being utilized for this purpose. Thus, we anticipate the need to require more focus on renewable

¹⁶ See Public Utilities Code Section 454.51(d).

integration long-term commitments as time goes on to ensure that we are adequately implementing the Legislature's direction to optimize among three coequal goals: environmental, reliability and cost.

As we have already signaled in recent rulings in this docket, the next cycle of IRP will contain a more in-depth analysis of the role of existing natural gas plants out to 2030. And the default assumptions for development of the next RSP are proposed to include an assumption of natural gas plant retirement after a 40-year life, just as we adopt herein for the PSP, instead of the indefinite lifetimes assumed in the RSP adopted in D.18-02-018. This 40-year life assumption reflects California's transition of its natural gas fleet, offering us a chance to see how long natural gas resources are needed and when appropriate moments may emerge to replace them with low- or zero-carbon alternatives.

But even so, these are planning assumptions and are not procurement actions that will necessarily result in the assumptions reflecting reality in the period until 2030. The IOUs have made it clear in their IRPs that they do not plan to contract for natural gas resources beyond the short term, and their load forecasts indicate that they have fewer reasons to take on this procurement than in the past. At the same time, CCA IRPs do not indicate that they intend to pick up such resources.

Table 7 below shows the percentage of CAISO system peak capacity (net qualifying capacity in August of each year) included in the LSE Conforming Plans in their individual IRP filings. As is clear from the table, the commitments for thermal resources, as well as biomass and biogas, are very low after 2022.

Table 7. Percent of CAISO System August Net Qualifying Capacity (MW) included in LSE Conforming Plans, by Year

Resource	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Combined Cycle	48%	47%	43%	41%	36%	32%	32%	32%	32%	32%	32%	32%
Combustion Turbine	67%	62%	60%	52%	25%	24%	24%	24%	23%	23%	18%	18%
Cogeneration	96%	87%	57%	47%	27%	25%	20%	20%	11%	11%	11%	11%
Internal Combustion Engine	77%	77%	77%	77%	77%	77%	77%	77%	77%	77%	77%	77%
Steam	2%	3%	16%	16%	16%	16%	16%	16%	0%	0%	0%	0%
Nuclear	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Solar PV	67%	73%	77%	77%	77%	77%	77%	77%	78%	78%	78%	74%
Solar Thermal	121%	121%	121%	121%	121%	121%	121%	121%	121%	121%	121%	121%
Hydro	60%	56%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
Pumped Storage	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Wind	95%	96%	97%	97%	97%	95%	95%	92%	91%	92%	94%	93%
Geothermal	75%	70%	70%	54%	51%	51%	51%	49%	49%	49%	49%	49%
Biomass	34%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%
Battery Storage	90%	94%	151%	72%	75%	84%	84%	70%	70%	70%	70%	70%
Biogas	30%	27%	27%	27%	27%	27%	27%	27%	27%	27%	26%	23%

Natural gas plant owners understandably want to plan for the future of their assets, and without any assurances from buyers, they face even greater uncertainty. This adds up to a need to focus 3-4 years out for the retention of necessary reliability and renewable integration resources to support the system for the planning horizon.

In addition, we agree with the parties that point out that some renewable resources and hybridized technologies (such as combined natural gas and storage or combined renewables and storage) can provide more reliability value

than we have been assuming. These types of solutions can potentially provide value in the same 3-4 year time frame.

Beyond this, we also need to begin taking steps to acquire some resources that will be needed further out in the planning period, potentially by 2030 or slightly beyond, depending on the progress of electrification efforts in the next decade. As the advocates for pumped hydro solutions and out-of-state wind point out, there are very long lead times associated with the development of these types of resources, and we may not be able to wait until the end of the next IRP cycle to begin the procurement and development process.

For all of these reasons, we conclude that the appropriate way to make more progress, beyond just utilizing more appropriate planning assumptions, is to begin to conduct procurement processes for various types of resources. This will allow us to test our assumptions and begin the acquisition process for the types of resources that we need and want to support the transition to 2030. Thus, we will open a “procurement track” in the IRP proceeding.

The procurement track will, at least initially, be focused on two types of procurement. First, in response to comments on the proposed decision by numerous parties representing individual or collective CCA interests, we agree that the primary responsibility for procurement rests with the individual LSEs to serve their own load. Our first purpose here in the procurement track, as suggested by TURN, will be to develop mechanisms for “backstop” procurement, in the event that an individual LSE or LSEs fail to procure the resources identified in their IRPs as necessary to fulfill their responsibilities for procurement. This will also include necessary coordination with the RPS and resource adequacy requirements.

The second aspect of procurement that we will address is procurement that may require collective action. That is, we will focus on procurement mechanisms to develop resources that one or a small number of LSEs may not be able to bring to fruition on their own.

In the procurement track, we will begin to tackle some of the critical questions we face in ensuring adequate clean resources and reliability, at lowest cost, through 2030, including:

- Who will procure?
- Will all entities procure, or will some just have their customers pay?
- What types of resources and how much should be procured, and by when?
- How will we handle the potential need for joint procurement among multiple smaller entities, for large resources? What procurement implementation ideas can we draw from the upcoming workshops to be held in the resource adequacy rulemaking?
- Should we place limits on the amount of uncontracted and/or unspecified power to serve load in particular years throughout the planning horizon, to ensure sufficient resource availability and more precisely identify procurement need?
- Should all LSEs be required to show, in their individual IRPs, that they are procuring a resource mix proportional or partially proportional to the mix in the adopted reference or preferred system portfolio?
- How will GHG emissions profiles from such resources be identified and assigned to all benefiting LSEs?

In answering the above questions, we will be focused on procurement activities addressing the following types of resources, with these types of specific attributes:

- Diverse renewable resources in the near term, to reduce reliance on fossil-fueled generation and at levels sufficient to reach the 2030 optimized portfolio, in coordination with the RPS program
- Near-term resources with load following and hourly or intra-hour renewable integration capabilities
- Existing natural gas resources at minimal levels consistent with reliability needs
- Long-duration storage, approached in a technology-neutral manner.

We are open to adding focus on additional resource types and attributes, depending on comments from parties. The procurement track will examine resource types, as well as the optimal locations for procuring those resources.

We decline to remove consideration of the needs of existing natural gas resources, as requested by numerous parties in comments on the proposed decision, suggesting that we instead address natural gas needs in the resource adequacy proceeding only. While the resource adequacy proceeding is focused on near-term reliability, especially in locally-constrained areas, here we are focused on medium- and long-term needs, though not necessarily long-term contracting for gas. We have amended the language above related to natural gas resources to make clear that while we do assume that some natural gas is needed through at least 2030, we will continue to focus on displacing as much natural gas as possible to reach our emissions goals, consistent with maintaining a reliable electric system.

We will also include in the procurement track consideration of the type of trigger mechanism proposed by SCE and supported by CESA. While we do not here adopt the specific aspects of the SCE proposal, development of an option where certain automatic processes begin when certain market conditions are met

may be an effective way of meeting reliability challenges, especially in the near term. We will examine these options further in the procurement track.

We intend to begin to address these issues in Summer 2019.

Finally, on the subject of some parties' comments on centralized capacity markets, we reiterate, as we stated in the recent resource adequacy decision, that our concern is that solutions be crafted that maintain California's control over its electricity resource choices to serve load in the state, as well as the retail energy markets. The electricity resource choices, and California's control over them, are the ultimate purpose of the IRP process. Should any viable centralized capacity market options emerge from the process being undertaken in the resource adequacy proceeding, we may consider them further here in the context of the IRP process and proceeding.

6. Diablo Canyon

6.1. Joint Parties' Petition for Modification of D.18-02-018

On February 28, 2018, Friends of the Earth (FOE), NRDC, CURE, and PG&E (Joint Parties) filed a Joint Petition for modification (Joint PFM) of D.18-02-018. The Joint PFM argues that D.18-02-018 only provides direction in the event that two generators at Diablo Canyon Power Plant (Diablo Canyon) are retired earlier than 2024-2025, which are the planned retirement dates for the two units. The Joint Parties claim that D.18-02-018 provides no direction at all for replacement resources for that planned retirement. Meanwhile, according to the Joint Parties, D.18-01-022, which approved the retirement of Diablo Canyon, stated that it was the intent of the Commission to avoid any increase in GHG emissions from the closure of Diablo Canyon and that any actions to that effect would be considered in this proceeding.

Further, the Joint Parties point out that D.18-02-018, when addressing the potential for early retirement of Diablo Canyon, only addressed any requirements to PG&E and not to any other LSEs. In addition, they argued that when the San Onofre Nuclear Generation Station (SONGS) was closed unexpectedly, the state faced an instantaneous replacement of mostly fossil-fueled energy, worsening the contribution of GHG emissions from the electric sector.

6.2. Responses to the Joint Petition

Timely responses to the Joint PFM were filed by AWEA, CalCCA, POC, and jointly by the following parties: GPI, UCS, EDF, CEERT, Sierra Club, and CEJA (Joint Responders).

AWEA agrees with the thrust of the Joint PFM, arguing that the Commission should order procurement of additional renewables to replace Diablo Canyon in this cycle of IRP and not wait for another IRP cycle. They point out that the value of the federal tax credits is declining, and thus there are advantages to ratepayers to buying additional renewable generation sooner rather than later. Ordering renewable procurement now would, they argue, effectuate the IRP principle that the impacts on ratepayers' bills be minimized. They also explicitly disagree with the rationale from D.18-02-018 that renewable costs may decline and thus potentially offset any tax credit benefits.

AWEA also states agreement with the basis for the Joint PFM, namely that D.18-02-018 did not squarely address or effectuate the requirements in D.18-01-022, Ordering Paragraph 5, that "efforts to avoid an increase in greenhouse gas emissions relating to the retirement of Diablo Canyon, including any replacement procurement, will be addressed in the Integrated Resource Planning proceeding."

CalCCA, on the other hand, does not support the modifications proposed in the Joint PFM for several reasons. First, they argue that D.18-02-018 already demonstrated that the RSP modeling already pre-selected GHG-free resources as the replacement for Diablo Canyon, in anticipation of its retirement, thus rendering the PFM unnecessary. They point out that the 42 MMT GHG goal should be a sufficient reference point for LSEs to plan their procurement to achieve the intended emissions goal.

Second, CalCCA argues that the Joint PFM does not provide any evidence that there will be an increase in GHG emissions if the Commission does not expressly evaluate each LSE's IRP based on the closure of Diablo Canyon. CalCCA points out that there will not likely be any need for procurement of replacement power by PG&E because of departing loads to CCA providers.

Finally, CalCCA argues that the SONGS situation is not analogous to Diablo Canyon, because the Commission will have ample time plan to address the retirement of Diablo Canyon during several IRP cycles, while the SONGS situation was unexpected.

POC also disagrees with the Joint PFM, arguing that it is not an appropriate use of the mechanism. They argue that the Joint PFM simply rehashes arguments already made by individual parties leading up to D.18-02-018, and does not introduce any new facts or reasons for consideration of the PFM. In support of their argument, POC includes specific quotes from the FOE and CURE comments on D.18-02-018 when it was at the proposed decision stage that largely track the Joint PFM filed subsequently.

In addition, POC points out that D.18-02-018 was hardly silent on the issue of Diablo Canyon retirement, including it in the modeling assumptions, making

the replacement of Diablo Canyon an implicit portion of the emissions reductions required by 2030.

POC also argues that focusing emissions reduction efforts around the closure of one particular plant is onerous and provides no additional benefit beyond the policy direction provided in D.18-02-018.

Finally, POC argues that there is no need for the Commission explicitly to direct PG&E or CCAs to “replace” Diablo Canyon, since they are already doing so without the need for such direction, by proposing their procurement plans out to 2030.

The Joint Responders (GPI, UCS, EDF, CEERT, Sierra Club, and CEJA) strongly support the Commission considering the impact of the retirement of Diablo Canyon in this proceeding, and suggest that the scope be amended to specifically include this topic. Thus, they support the Joint PFM.

In particular, the Joint Responders suggest that the Commission give explicit direction to all LSEs to plan for the retirement of Diablo Canyon in their individual IRPs. They point to the modeling conclusions leading to D.18-02-018 that show a system-wide GHG emissions increase coinciding with the closure of Diablo Canyon.

Thus, the Joint Responders suggest several procedural steps that the Commission should take to ensure replacement of Diablo Canyon power with GHG-free resources, including: 1) a ruling opening a new track in the proceeding; 2) a workshop and opportunity to file additional comments to discuss potential modeling; 3) a threshold ruling specifying which entities should be responsible for planning for replacement resources and how cost allocation issues will be handled; and 4) an update to the current modeling to ensure that no bump in air pollution or greenhouse gas emissions occurs as a result of the

retirement. They argue that these steps are consistent with the direction in D.18-01-022.

In reply to the responses discussed above, the Joint PFM parties point out that the majority of environmental parties that come before the Commission are in support of the PFM and agree that the Commission stated its intent not to have the closure of Diablo Canyon trigger any increase in GHG emissions.

In response to CalCCA, the Joint Parties dismiss CalCCA's arguments that their individual IRPs will take care of the replacement power question for Diablo Canyon without further direction from the Commission. The Joint Parties are concerned that CalCCA's opposition to the Joint PFM actually reinforces the need for explicit Commission direction to all LSEs.

The Joint Parties also continue to argue that the Diablo Canyon situation is very similar to what happened with the closure of SONGS, except that now the Commission has the opportunity to plan for the closure in advance.

In response to POC, the Joint Parties disagree that it was procedurally improper to file a PFM. They generally argue that POC and CalCCA are in favor of a business-as-usual approach to the closure of Diablo Canyon.

6.3. Discussion

Before discussing the Joint PFM, we acknowledge that in addition to the direction given by the Commission in D.18-01-022, the Legislature subsequently passed and former Governor Brown signed SB 1090 (Monning, 2018) that contains the following requirement for the Commission: "The Commission shall ensure that integrated resource plans are designed to avoid any increase in

emissions of greenhouse gases as a result of the retirement of the Diablo Canyon Units 1 and 2 powerplant.”¹⁷

In this decision, we confirm our approach to this legislative requirement, as well as responding to the Joint PFM. We acknowledge that D.18-02-018 was not as clear as it could have been about the disposition of issues related to Diablo Canyon, largely because the resolution of Application 16-08-006 was being resolved in parallel with our consideration of the RSP in this proceeding.

But in concept, our intention was that D.18-02-018 already represented the implementation of SB 1090 and the intention articulated in D.18-01-022. But we will make a few requirements more explicit in this decision, as discussed below.

As D.18-02-018 explained:

“The expiration and/or renewal of the ITC [investment tax credit] and PTC [production tax credit] would affect the optimal timing for purchasing additional solar and wind. This also interacts with the timing of the replacement of the power from the Diablo Canyon nuclear plant, because, rather than waiting until the plant is retired (assuming that occurs), the model essentially chooses to pre-purchase the solar and wind power that would otherwise be needed later in the next decade, in order to take advantage of the cost savings associated with the ITC and PTC. In other words, the replacement power in the amount of Diablo output is already being replaced by GHG-free resources prior to the retirement of the nuclear plant. And in all scenarios, the GHG emissions constraints in the CAISO area are met or exceeded.”¹⁸

By utilizing the assumption that the two Diablo Canyon units will retire in 2024 and 2025, as we did with the formulation of the RSP adopted in D.18-02-018,

¹⁷ See Public Utilities Code Section 712.7(b).

¹⁸ D.18-02-018 at 41.

we are already planning for the emissions impact of that action. Analysis conducted leading up to the issuance of D.18-02-018 showed that the electric sector will still be on a trajectory to satisfy the 2030 GHG emissions target even with the retirement of Diablo Canyon. Stated another way, the retirement of Diablo Canyon will not prevent the electric sector from meeting its portion of the statewide GHG obligations between now and 2030.

The Joint Parties to the PFM would have us read the SB 1090 requirements and the D.18-01-022 commitments more narrowly, such that there would not be any increase in emissions at the very moment that the Diablo Canyon units go offline. For a number of reasons, this is not a reasonable reading of the intentions of the Legislature or the Commission.

Emissions from the electric sector in California vary considerably every year depending on the hydroelectric production, the retirement of power plants, the growth in load, the functioning of the natural gas system, and many other factors. Expecting an exact one-for-one replacement of energy from Diablo Canyon that is timed perfectly to coincide with the Diablo Canyon closure would be a costly and illogical way to ensure that the emissions trajectory of the electric sector is on track to meet the State's goals.

If we read the Legislative intent so narrowly, as the Joint Parties filing the PFM would have us do, we would wait to procure additional renewables and have them come online only in 2024 or 2025, in order to ensure no uptick in emissions at the time of Diablo Canyon retirement. That would risk further erosion of the benefits of any federal tax credits, as well as likely require over-procurement of renewables because of the different capacity values of Diablo Canyon and most renewables. Both of these consequences would cost ratepayers extra money unnecessarily. Instead, while the specific year-on-year

changes in emissions as Diablo Canyon units retire are difficult to predict and control, as long as LSEs procure resources consistent with the Commission's adopted system resource portfolios, emissions will remain below the levels required to keep the state on a trajectory to our 2030 electricity sector goal of 42 MMT.

This is all notwithstanding the commitment that PG&E made when it filed the application for the closure of Diablo Canyon that they would replace the power with clean energy. The fact is that with the considerable load departure to CCAs in PG&E's territory, PG&E likely does not need to replace the power at all, or at least not all of it. Instead, numerous CCAs need to be procuring to serve their load, which most are proposing to do in their IRPs, and mostly utilizing renewable resources.

As mentioned above, since Diablo Canyon was a baseload resource and most renewable resources are not, if anything we are concerned that the replacement power procured mostly by CCAs will not represent as reliable a resource as Diablo Canyon has proven to be over the decades. This concern is largely addressed in Section 5 above related to reliability.

Including an assumption of the retirement date for Diablo Canyon in the analysis for each IRP cycle will allow the LSEs collectively to plan for the purchase of power in an orderly fashion to serve the load that was previously served by Diablo Canyon output. Each LSE is required to plan to serve their portion of that load in general, regardless of the planned retirement of any particular power plant.

In addition, to ensure that there is explicit attention to this issue, since Diablo Canyon is a large resource, we will require each LSE that serves load in PG&E distribution territory to include a section in its next IRP filing explicitly

addressing its plans to address the Diablo Canyon retirement. In addition, due to the baseload nature of Diablo Canyon, we will require each LSE serving load in PG&E's territory to address how it will replace the characteristics of the Diablo Canyon output with either flexible baseload and/or firm low-emissions energy.

We will not, however, allocate a specific replacement capacity or energy to each LSE. The responsibilities for the replacement of Diablo Canyon are embedded in the load assumptions already being planned for by PG&E and the CCAs operating in its territory.

7. Lessons Learned for Use in 2019-2020 IRP Cycle

This section covers key lessons offered by the Commission and some parties about what worked and what did not in the first cycle of IRP, and any changes we intend to make for the next cycle. Each LSE also included a "lessons learned" section in its IRP and some elements of this discussion are also drawn from those ideas from LSEs. The sections below cover the main themes of lessons from this round.

7.1. IRP Process

With respect to the IRP process in general, Commission staff observe that the two-year cycle has required a heavy workload and fast pace from staff and parties, which is a challenge. In preparation for the next cycle, Commission staff may suggest ways in which the process can be streamlined to be less intense and less tightly scheduled.

Another takeaway is that we currently lack a compliance enforcement mechanism if LSEs fail to adhere to the filing requirements and deadlines. For example, Commercial Energy of California has failed to file an IRP at all. The Commission will develop a citation program similar to those that exist for the resource adequacy and RPS proceedings, to encourage LSEs to submit their

filings on time and in compliance with all of the overall requirements on the first try.

We also observe that there was some confusion over particular terms we created with respect to the IRP process, such as: LSE Plan vs. LSE IRP; Alternative LSE Plans vs. Alternative Plans for Standard LSE Plan filers, RSP vs. RSP with 2017 IEPR assumptions, etc. We will work on clarifying these types of references in the future to reduce confusion.

The three large IOUs all pointed out that it is problematic that some CCAs advised the Commission to refrain from utilizing their IRPs for statewide planning. PG&E suggested that all LSEs should be including their best view of their long-term resource needs and expected procurement strategies, in order to meet the state's goals. SCE was more concerned that some CCAs referred to an intention to develop separate IRPs outside of the Commission's process. SCE suggests that any missing information in an LSE's IRP could lead to a statewide deficiency, and that therefore all LSEs should align their processes with the Commission's and be required to submit their internal IRPs to the Commission. We agree and have already discussed this in the individual IRP section above. Finally, SDG&E would like us to reiterate that we enforce compliance with SB 350 and not the local governing boards of CCAs, and that the Commission's IRP process is mandatory. We also agree with this.

TURN was particularly concerned with the limited-term load forecasts of the ESPs, stating that they limit the value of the ESP plans. TURN suggests that this calls for the Commission to consider more comprehensive centralized procurement approaches that can enter into long-term commitments on behalf of aggregated ESP customer loads.

Finally, PG&E pointed out that no LSEs proposed to build new natural gas resources or to institute long-term contracts with existing natural gas resources, despite the fact that the RSP assumed that the gas fleet remains operational, with the exception of once-thru-cooling units. This suggests that many LSEs are relying on unspecified, short-term market purchases from existing natural gas generators to meet future projected reliability needs. PG&E suggests that this is not a sustainable solution to maintaining the generators needed to ensure a reliable system in the future. We agree, as discussed above in Section 5 on reliability.

7.2. Planning Assumptions

In the area of planning assumptions, CEJA and Sierra Club, as well as PG&E, commented that the majority of the LSEs did not engage in the comprehensive planning necessary for California to achieve its GHG and air pollutant requirements and goals. In particular, they commented that it is unclear how the IRPs will provide assurance that California is on the path to meet its GHG and criteria air pollutant requirements when nearly all LSE stress how uncertain their assumptions are and that the types of resources procured are likely to change from their plans. We agree that this will be an ongoing challenge, and is part of the reason for the iterative nature of the IRP process.

TURN focused its comments in this area on the utilization by LSEs of a great deal of unspecified capacity and energy in the plans. TURN recommended that the Commission staff provide a summary of the amount of “unspecified” energy and capacity included in the 2030 LSE portfolios to assess whether such aggregate levels of unspecified capacity and energy will actually be available to LSEs. We intend to do this in the next IRP cycle, and will also consider placing

limitations on the amount of unspecified energy and capacity that each LSE may include in its plan (see discussion in Section 5 on reliability above).

Finally, Tiger suggests that the Commission hold a workshop with the aim of identifying IRP informational and analytical requirements that may be eliminated for ESPs without detracting from the Commission's ability to meet its statutory requirements. EDF Industrial also commented that some items could possibly be eliminated. We will consider this issue when we revisit the filing requirements for the next round of IRPs in the 2019-2020 IRP cycle.

7.3. Regulatory Agency Coordination

Several parties commented that there are differences in GHG accounting assumptions and methodologies between the Commission, the CAISO, CARB, and the CEC. This can create confusion for LSEs and make it more difficult to monitor and assess the collective progress of LSEs and POUs toward achieving the state's long term GHG reduction goals. MCE, PCE, PG&E, and Shell all pointed out the desire for consistency with respect to reporting requirements between the regulating agencies. PG&E suggests that the Commission and CEC hold a joint workshop to explain the differences between the Commission's forecasting methodology and the CEC's reporting accounting methodology, and also explore with stakeholders how to create more consistency between the two. We will consider this in coordination with the CEC.

Shell also suggested that the Commission and CEC consider consolidating with IRP other compliance filings such as the annual RPS compliance and load forecasts, at least in years when IRPs are filed. Shell is seeking consistency among the processes and also potential to eliminate the need to file the same datasets multiple times. This is another idea worth exploring in the next cycle of IRP.

TURN also suggested a focus on the potential for “resource shuffling” and a multi-agency approach to various compliance policies to minimize this potential. We also will explore this further in the 2019-2020 cycle of IRP.

7.4. Resource Adequacy Coordination

The large IOUs all also commented on the need for closer coordination on issues related to reliability, including with the resource adequacy requirements and process.

PG&E commented that reliability is of paramount importance to the IRP process. However, they were concerned that the models used in the IRP are not sufficient to provide a comprehensive reliability assessment (including SERVM) and that usually we rely on the CAISO to provide this level of analysis in its TPP. PG&E urged the Commission to give guidance on the standards for the system local, and flexible capacity needs assessments that should be applied in future LSE IRPs.

SCE urged the Commission to study the reliability effects of reductions in revenue for natural gas plants, the potential economic retirements of such plants, and the ability of the natural gas system to meet electric generation plant demand under the Commission’s RSP.

SDG&E suggested that the Commission establish an accurate view of reliability needs as soon as possible and require the ESPs and CCAs to provide the associated information.

We agree that this initial IRP process signaled the need for closer coordination on reliability issues and resource adequacy. We intend to address these questions during our “procurement track” discussed in Section 5 above.

7.5. GHG Planning and Accounting

We note that none of the LSEs used the GHG Planning Price established in D.18-02-018 for their portfolio planning, instead opting to use the LSE-specific 2030 GHG benchmark, which more clearly aligns with the CNS methodology. While we intend to continue to calculate a GHG Planning Price for use in cost-effectiveness testing and potentially other purposes, we will continue to give LSEs the option not to use it for their resource portfolio planning.

Meanwhile, specifically for the use of the CNS calculator, we recognize that clearer instructions are needed for LSEs for how to complete entries into the calculator, what fields can be modified, and what supporting information may be required. We will explore this prior to the next IRP filing date, and also consider merging elements of the CNS calculator with other LSE data templates to help ensure consistency across filing materials.

CalCCA specifically noted that the CNS Calculator did not include a way to input energy-only large hydro contracts, a way to enter blocked and shaped conventional supply as a contracted resource, nor a way to represent energy-only contracts that specify deliveries in energy without specifying the nameplate capacity of the delivering resource. Meanwhile, PG&E and SCE pointed out that the tool did not incorporate emissions from minimum operating conditions.

With respect to emissions from CHP, Cal CCA noted that the CNS Calculator did not account for the existence of possible new CHP tariffs that would allow for curtailment within CCA geographic areas. SCE also noted that though many LSEs do not have CHP contracts that extend out to 2030, there may very well be CHP operations that will be serving system load and contributing emissions in 2030, which would lead to a discrepancy in total GHG emissions from the sector.

All of these suggestions are improvements we can consider in developing the next version of the tool.

In addition, in response to comments from PacifiCorp, we acknowledge that the CNS Calculator tool is not appropriate for or applicable to LSEs who do not serve load within the CAISO footprint. Thus, those small number of LSEs should not be required to utilize the CNS Calculator and may use alternative means of estimating their GHG emissions, as suggested by PacifiCorp.

In addition, Commission staff will continue to benchmark the modeled GHG emissions in RESOLVE, for the next IRP cycle against the actual GHG emissions reported by the CAISO for the previous year. This should help continuous improvement in methodologies, model functionality, and approach that can be applied in subsequent IRP cycles, and to help close the gap between the modeled and the actual emissions.

SCE, CEJA, Sierra Club, and POC also suggested that the Commission consider establishing a standard methodology, similar to the CNS calculator, for estimating air pollutant emissions attributable to the LSE portfolios. We will consider this for the next IRP cycle, subject to staff and consulting availability.

PG&E recommended that the Commission work with CARB as it implements AB 617 to design a comprehensive, multi-sector approach to address air quality issues in the state's disadvantaged communities using the most cost-effective solutions across sectors, including consideration of utilizing zero or near-zero-emissions transportation technologies.

Finally, in comments on the proposed decision, Cal Advocates suggested that the Commission should make a finding associated with each individual LSE's IRP as to whether or not the IRP has met the filing requirements associated with the entity's GHG obligations and would put them on a path to achieve their

portion of the 2030 GHG goals. We agree, and will include this type of finding in future decisions similar to this one, when adopting the PSP and approving or certifying the individual IRPs.

In addition, Cal Advocates suggests that each LSE should be required to file, in its individual IRP, a conforming portfolio that meets the GHG Benchmark. We will include this requirement as well for future individual IRP evaluation.

7.6. Templates for Next IRP Cycle

Several of the LSEs complained that the filing requirements for this cycle of the IRP process were onerous. EBCE suggested that Commission staff create data templates for reporting items such as resource cost assumptions (i.e., renewable energy credit (REC)) costs, resource adequacy costs for local, system, and flexible products, CAISO market prices, and gas prices) to make the process of developing conforming data assumptions less onerous for LSEs. SBCE and PCE suggested improving harmonization between model input structure and actual contract structure. They stated that LSEs faced challenges translating information from specific contracts into the Commission-provided templates and GHG calculator, and that the templates appeared to assume a specific type of contract which may or may not be applicable.

SVCE also commented that the baseline and new resource templates required very high temporal and resource granularity. However, future uncertainty meant that the Commission was requiring a level of rigor that is not appropriate given that uncertainty.

We agree that the process could benefit from less ambiguous rules about how to enter planned procurement data into the templates for current and future contracts. In addition, our templates can reflect more potential contractual arrangements than were reflected in this first cycle. In addition, potentially less

detail could be required about future resource plans that are subject to change. Commission staff will endeavor to improve these templates in preparation for the next IRP submissions.

In addition, Commission staff have noted that the Alternative LSE Plans, intended to reduce the regulatory burden for smaller LSEs, provided limited value to the IRP process other than verification that the LSEs would achieve their GHG benchmarks. In the next cycle, we may consider either exempting smaller LSEs from filing IRPs at all, or for some, requiring them to file Standard Plans like other LSEs.

8. Comments on Proposed Decision

The proposed decision of ALJ Fitch in this matter was mailed to the parties in accordance with Section 311 of the Public Utilities Code and comments were allowed under Rule 14.3 of the Commission's Rules of Practice and Procedure. Comments were filed on or before April 8, 2019 by the following parties: AWEA; Cal Advocates; Calpine; CAISO; CalCCA; CalWEA; CEJA and Sierra Club, jointly; CEERT; CESA; CCSF; CGNP; CLECA; DOW; EBCE and PCE, jointly; First Solar; FOE, NRDC, and CURE, jointly; GPI; GridLiance; IID; LSA; LS Power; Middle River; National Grid; NRG; Ormat; PacifiCorp; PG&E; POC; Range; SCE; SDG&E; SEIA; Shell; Solana; SWPG; TransWest; TURN; UCS and NRDC, jointly; WEM; and Wellhead.

Reply comments were filed on or before April 15, 2019 by the following parties: AWEA; Cal Advocates; Calpine; CAISO; CalCCA; CEJA and Sierra Club, jointly; CEERT; CCSF; Eagle Crest; EDF; GPI; GridLiance; Hydrostor; IID; LSA; Ormat; POC; PG&E; Reid; SCE; SDG&E; and SJCE.

Because of the large number of parties and issues covered in this decision, this section primarily summarizes the changes made in response to specific

comments from parties, but does not attempt to detail the numerous issues covered in each set of comments.

In general, the clear majority of parties supported most aspects of the proposed decision as written. In particular, there was strong support for rejecting the hybrid conforming portfolio as the preferred system portfolio, except among some parties representing CCAs, as well as LSA. There was also strong support for the proposal to institute a “procurement track,” though there was a lot of disagreement about how exactly that procurement track should be structured.

We detail our response to this issue, as well as other comments raised by parties, and our recommended changes in response, below. The changes described are in no particular order.

First, with respect to the framing of the procurement track, we have made modifications in response to the comments of TURN to make clear that at least our initial focus will be on two aspects of procurement: backstop procurement, in the event that there is a gap between the plans of individual LSEs and their actual procurement to comply with those plans; procurement that may require collective action, because an individual LSE or a small number of LSEs will be unlikely to be able to support development of a particular type of resource on their own.

Numerous parties, including CCSF and Shell, also commented that any procurement activities related to natural gas plants should be coordinated with the resource adequacy proceeding. While we agree that coordination is important, we decline to remove consideration of natural gas procurement in the IRP context in favor of handling it only in the resource adequacy context, as was

suggested by several parties in their comments, including CEERT, CEJA, and Sierra Club.

UCS and NRDC also commented that any attention to natural gas plants in the procurement track should await the conclusion of the analysis proposed for the next cycle of IRP related to retention of thermal generation. While we agree that longer-term decisions about the optimal level of natural gas resources to maintain on the system should await the results of the proposed analysis, there may be potential near-term and system-level natural gas retention or reliability issues that can or should be addressed sooner, based on current knowledge.

CEJA and Sierra Club focused many of their comments on the fact that any attention to natural gas procurement should be focused on the need to minimize, or preferably eliminate, reliance on natural gas resources as soon as possible. We have modified the language on natural gas procurement to emphasize this priority, consistent with the state's long-term goals.

In response to the comments of Range and LS Power, we have also made edits to clarify that the aspects of the procurement track devoted to long-duration storage will not be presumed to include only pumped hydro resources, but in fact will be approached in a technology-neutral fashion. To enhance that understanding, we have removed the designation of long-duration storage as eight hours or more. The exact nature of the long-duration storage to be sought in the future will be explored further during the procurement track.

Finally, with respect to the procurement track activities, in response to the comments of SCE and supported by CESA, we have included in the scope of the procurement track consideration of the type of trigger mechanism proposed earlier in the proceeding by SCE.

In response to CCSF's comments, we have amended the requirement for a Tier 2 advice letter filing for those LSEs whose individual IRPs were not approved or certified in this decision, such that the LSEs may file an appendix or supplement to their IRP with the missing information, and are not required to file a completely new comprehensive IRP.

Also in response to CCSF, we make clear that the additional information required from LSEs serving load in PG&E's territory to address the energy needed to replace the output of Diablo Canyon is an issue to be included in the next individual IRPs due in 2020, not for the supplemental filings to the 2018 individual IRPs required by June 14, 2019.

With respect to the requirement that each LSE serving load in PG&E's territory address how they will plan for Diablo Canyon replacement, Ormat's comments also point out that the baseload nature of Diablo Canyon output should be addressed. Thus, we have included a requirement that each LSE specifically address how they will approach replacement of the characteristics of Diablo Canyon's output, including flexible baseload and/or firm low-emissions energy, in their plans beginning in 2020.

We decline to make the change requested by the Joint Parties who filed the PFM of D.18-02-018, as well as GPI, with respect to Diablo Canyon replacement energy, who requested that we explicitly include this issue in the procurement track of this proceeding. Our intention is to ensure that the electric sector under our purview, as a whole, is on a trajectory to meet our 2030 target, without assigning explicit and prescriptive volumes of procurement to individual entities as a direct result of Diablo Canyon retirement. Since procurement in anticipation of this event is already occurring, and though we acknowledge there may be an impact on emissions immediately following the retirement of Diablo Canyon,

this event should not have a similar outcome to the unexpected retirement of SONGS.

In response to comments from PacifiCorp, we have amended the requirement for use of the CNS calculator to apply only to those LSEs whose territory is within the CAISO footprint. If it is located outside of the CAISO, an LSE may use alternative means of estimating its GHG emissions, in consultation with Commission staff.

In response to the comments of both Wellhead and First Solar, we have enhanced the findings and conclusions of the decision to make clear that hybrid technologies and renewables can bring potential value to the system for renewable integration purposes.

Next, all of the large IOUs, as well as TURN, Sierra Club, and CEJA, requested that we commit to developing an enforcement mechanism sooner rather than later, particularly in light of the fact that one LSE failed to provide an IRP at all in this round. We have enhanced the language in this decision on this point, and intend to move forward with a citation program similar to the resource adequacy and RPS enforcement mechanisms quickly. However, we do not go as far as TURN would like to initiate enforcement against the non-filing LSE at this time, because that would divert time and focus in this proceeding itself; rather, the enforcement aspect will be developed through a staff-driven effort culminating in a formal resolution brought before the Commission.

Cal Advocates, in its comments, suggested that the Commission should make a finding associated with each individual LSE's IRP as to whether or not the IRP has met the filing requirements associated with the entity's GHG obligations and would put them on a path to achieve their portion of the 2030 GHG goals. We have not included this explicit finding in this decision, but will

include this type of finding in future decisions similar to this one, when adopting the PSP and approving or certifying the individual IRPs.

The comments of GridLiance and LSA were critical of the late-stage updates that Commission staff made to the portfolios recommended in this decision based on new transmission availability data made available informally by the CAISO to the Commission. We are sympathetic with those concerns, and have made modifications both to the description of the source of the transmission availability data, and to the description of a more desirable process for incorporating such data in the future. In particular, we intend to make additional improvements to the process for each IRP cycle, ideally utilizing one set of assumptions during each vintage of IRP analysis, striving for transparency and ability of stakeholders to comment on the assumptions and analysis conducted at each step. There is a continuing tension between the desire to include the most up-to-date technical information and the desire to allow maximum stakeholder review and vetting. We will strive to improve our approach to these issues in future IRP cycles.

A similar set of issues was raised by First Solar, SEIA, and CEERT in comments on the proposed decision with respect to the adjustments made by Commission staff to allocate certain renewable resources as energy-only instead of fully deliverable, as part of the optimal portfolio. SEIA correctly points out that the deliverability status of a project may affect its position in the market and its ability to be financed. All of these parties also argue that part of the purpose of the portfolio development is to analyze the transmission needed to support the generation. This is also related to the quality of information received in the individual IRPs, since in the round it was difficult to tell how firm the choices of some LSEs might be. While we do not adjust the portfolio adopted in this

decision to account for these uncertainties in this round, we commit to improving this aspect of the analysis for the next IRP cycle such that deliverability status adjustments by staff are minimized or eliminated.

Some parties including the CAISO, EBCE, and PCE, suggested that the Commission should continue to conduct reliability analysis on the portfolio adopted in this decision. We decline to commit to this step. Instead, we prefer to focus attention and resources on development of the optimal portfolio for the next IRP cycle, focusing on improving the assumptions and analysis for the next generation of modeling. In addition, as already stated elsewhere in this decision, Commission staff will spend more time and attention in the next IRP cycle on model calibration, and vetting the results with parties, prior to recommending the next optimal portfolio.

Numerous parties also commented that the PSP adopted in this decision should not be used as the basis for any procurement resulting from the procurement track. While we agree that the portfolio we adopt here may not be perfect, it can certainly serve as the basis for at least some procurement decision-making, as there is likely no-regrets procurement that could be conducted in the near term without necessarily addressing all of the resources identified in this PSP as needed all the way through 2030. The portfolio adopted here is still the best-available analysis to support any procurement actions, especially with respect to the new resources needed, at least until such time as the Commission analyzes and adopts a subsequent portfolio. This may also depend, at least in part, on coordination with the RPS program and any gaps that may exist between RPS compliance and the portfolio identified as optimal by the IRP process. Coordination with resource adequacy requirements will also be

important, and those needs and analyses may also augment the information available from the portfolio adopted in this decision.

CalCCA requested that we remove reference to the fact that all system resources are needed at the present time for renewable integration. We decline to make this change, because it is now more important than ever that we acknowledge that all types of resources currently on the system are working together to make possible integration of more and more renewables over time. This is not to say that every individual resource is needed as a renewable integration resource; for example, there may be a lower optimal level of natural gas resources needed than currently contracted, as additional analysis proposed for the next IRP cycle is designed to address. However, the renewable integration characteristics of all of the *types* of resources involved in the current system, including both supply and demand-side resources, are necessary to accomplish renewable integration currently, because renewables are the new resources being bought most frequently, particularly by CCAs.

In sum, we appreciate the thoughtful and careful comments by parties in response to this proposed decision, and have made numerous improvements in response.

9. Assignment of Proceeding

Liane M. Randolph is the assigned Commissioner and Julie A. Fitch is the assigned ALJ in this proceeding.

Findings of Fact

1. All LSEs required by D.18-02-018 to file an individual IRP or documentation substantiating eligibility for an exemption did so, with the exception of Commercial Energy of California, an ESP.

2. The following entities provided the appropriate information to justify an exemption from filing an individual IRP: Anza Electric Cooperative, EnergyCal USA (dba YEP Energy), Gexa Energy California, Liberty Power Delaware, Liberty Power Holdings, Plumas Sierra Cooperative, Praxair Plainfield, Surprise Valley Electric Cooperative, and VEA.

3. The individual IRP filings of the following IOUs provided all of the information required by D.18-02-018 to an adequate degree: Bear Valley Electric Service, Liberty Utilities, Pacific Gas and Electric, PacifiCorp, San Diego Gas & Electric, and Southern California Edison.

4. The individual IRP filings of the following ESPs provided all of the information required by D.18-02-018 to an adequate degree: 3 Phases Renewables, Agera Energy, American PowerNet Management, Calpine Energy Solutions, Calpine PowerAmerica CA, Direct Energy Business, EDF Industrial Power Services, Just Energy Solutions, Regents of the University of California, and Tiger Natural Gas.

5. The individual IRP filings of the following CCAs provided all of the information required by D.18-02-018 to an adequate degree: Desert Community Energy, Peninsula Clean Energy Authority, Redwood Coast Energy Authority, and Solana Energy Alliance.

6. The following ESPs included inadequate information on criteria pollutants associated with generation used to serve their loads in their individual IRPs, as required by D.18-02-018: Constellation NewEnergy and Shell Energy.

7. The following CCAs included inadequate information on criteria pollutants associated with generation used to serve their loads in their individual IRPs, as required by D.18-02-018: Apple Valley Choice Energy, Clean Power Alliance of Southern California, CleanPower San Francisco, East Bay Community

Energy, King City Community Power, Lancaster Choice Energy, Marin Clean Energy, Monterey Bay Clean Power Authority, Pico Rivera Innovative Municipal Energy, Pilot Power Group, Pioneer Community Energy, Rancho Mirage Energy Authority, San Jacinto Power, San Jose Clean Energy, Silicon Valley Clean Energy Authority, Sonoma Clean Power Authority, and Valley Clean Energy Alliance.

8. Additional information about criteria pollutants associated with serving load is a required part of the Commission's responsibility to ensure compliance with Public Utilities Code Section 454.52 (a)(1)(H).

9. Liberty Utilities (CalPeco Electric) in its individual IRP sought authorization to solicit energy resources on a short-term basis to replace the full requirements contract that it previously had with NV Energy, delivering a combination of renewable and non-renewable power to serve its load. In D.19-02-007 in the RPS proceeding, the Commission handled the renewable-related portions of Liberty Utilities' request. The non-renewable portion of the request for short-term bridging authority is reasonable.

10. Liberty Utilities (CalPeco Electric) does not currently operate with a bundled procurement plan structure similar to the larger IOUs and thus must typically handle cost recovery requests via individual applications.

11. Commission staff analysis to aggregate the portfolios included in the individual LSE IRPs and check their feasibility, including adjustments where resource potential or transmission availability in particular geographic areas was exceeded, was reasonable and necessary.

12. In the 2018 IRPs of many LSEs, we were unable to distinguish between resources that represented existing contractual obligations and generic aspirational choices made by LSEs to round out their portfolios.

13. The Commission's primary responsibility, in implementing the provisions of Public Utilities Code Sections 454.51 and 454.52, is to ensure an electric resource portfolio, for the aggregated LSEs within its purview, that meets the state's GHG emissions, reliability, and cost requirements, as well as other state goals.

14. The aggregated LSE IRP resources, referred to herein as the hybrid conforming portfolio (HCP), did not meet the CARB or Commission GHG emissions target for the electric sector for 2030, and was also less reliable than the RSP adopted in D.18-02-018, as updated with the 2017 IEPR assumptions.

15. The HCP did not achieve the 60% RPS requirement in 2030.

16. All of the LSEs collectively, as represented by the HCP, showed a deficiency in the area of reliability and renewable integration resources necessary to achieve the 2030 GHG or reliability needs of the system.

17. The HCP included less geothermal energy than the RSP with 2017 IEPR assumptions, resulting in less high capacity factor renewable energy.

18. The HCP had more renewable capacity but produced less renewable energy than the RSP with 2017 IEPR assumptions.

19. The HCP contains longer duration batteries but less capacity overall than the RSP with 2017 IEPR assumptions.

20. The RSP adopted in D.18-02-018, with adjustments updated to reflect the 2017 IEPR assumptions, is a reasonable alternative for adoption as the PSP for the 2017-2018 cycle, but its main shortcoming is in the assumption that natural gas resources would exist in perpetuity.

21. It is possible to infer based on analyses of the year 2030 conducted by Commission staff, CAISO, and SCE, that the RSP adopted in D.18-02-018, with adjustments updated to reflect the 2017 IEPR assumptions and including a new

assumption of a 40-year life for natural gas resources, would represent a more reliable portfolio than the HCP in the 2017-2018 IRP cycle.

22. The RSP, with adjustments updated to reflect the 2017 IEPR assumptions and including a new assumption of a 40-year life for natural gas resources, would meet the RPS requirements in 2030 and the Commission's target for the electric sector of 42 MMT of GHG emissions by 2030.

23. Each year the CAISO's TPP studies, as well as its GIDAP studies, produce updated information on transmission availability and cost of upgrades.

24. Study of two distinct portfolio choices as policy-driven sensitivities in the CAISO's TPP in 2019-20 would provide valuable information for future planning activities. Those two choices are a heavily in-state renewable development portfolio and a portfolio based more heavily on out-of-state renewable development, primarily wind from New Mexico and Wyoming.

25. The IRP process is not just an advisory planning exercise. Procurement is likely to be required from the IRP process in the near future. The bi-annual IRP process provided a snapshot of each LSE's progress toward meeting the 2030 GHG emissions goal. Identified deficiencies provide an opportunity for the Commission to send a signal for additional procurement.

26. Reliability and cost considerations are coequal goals with the GHG emissions goals in IRP, and are integral to a successful IRP process.

27. D.18-02-018 required LSEs to create a conforming portfolio to the RSP by utilizing either the GHG Planning Price or their GHG Emissions Benchmark.

28. The IRP process is intended to be integrated, with focus on renewable and non-renewable resources, as well as existing and new resources.

29. The IRP proceeding is the only venue where the Commission comprehensively examines environmental, reliability, and cost issues for all LSEs.

30. CCAs, because of load migration, are likely to be the entities acquiring the most electricity resources between now and 2030.

31. The IRP filings of the majority of the CCAs were focused heavily, if not exclusively, on the acquisition of renewable and storage resources.

32. Renewable and storage resources alone are not sufficient, at present, based on existing technologies and costs, to provide enough renewable integration services to result in electric system reliability at the system level.

33. Currently, all types of electricity resources available on the CAISO system are needed for renewable integration, though not necessarily in current quantities.

34. Some natural gas generation resources will still be needed to preserve system reliability in 2030. The Commission is in the process of continuing to study the likely amount of such resources needed to remain online.

35. Renewable resources and hybrid technologies, including storage combined with both renewables and fossil-fueled generation, may be able to provide additional ramping, load following, and ancillary services to decrease renewable integration challenges at the system level.

36. The Commission has the authority to order long-term procurement of renewable integration resources by CCAs, provided in Section 454.51(d) of the Public Utilities Code.

37. FOE, NRDC, CURE, and PG&E filed a Joint Petition for Modification of D.18-02-018 seeking direction on replacement power for the Diablo Canyon Power Plant, with its two units set to retire in 2024 and 2025.

38. SB 1090 (Monning, 2018) required the Commission to ensure that the IRPs are designed to avoid any increase in emissions of GHGs as a result of the retirement of Diablo Canyon.

39. The RSP adopted in D.18-02-018, as well as the PSP recommended in this decision, puts the electric sector on a trajectory to satisfy the 2030 GHG emissions target even with the retirement of Diablo Canyon.

40. The retirement of Diablo Canyon will not prevent the electric sector from meeting its portion of the statewide GHG emissions reductions between now and 2030.

Conclusions of Law

1. The Commission should approve the request for exemption from filing an individual IRP in 2018 for the following entities: Anza Electric Cooperative, EnergyCal USA (dba YEP Energy), Gexa Energy California, Liberty Power Delaware, Liberty Power Holdings, Plumas Sierra Cooperative, Praxair Plainfield, Surprise Valley Electric Cooperative, and VEA.

2. The Commission should approve the individual IRPs of the following IOUs: Bear Valley Electric Service, Liberty Utilities, Pacific Gas and Electric, PacifiCorp, San Diego Gas & Electric, and Southern California Edison.

3. The Commission should approve the individual IRPs of the following ESPs: 3 Phases Renewables, Agera Energy, American PowerNet Management, Calpine Energy Solutions, Calpine PowerAmerica CA, Direct Energy Business, EDF Industrial Power Services, Just Energy Solutions, Regents of the University of California, and Tiger Natural Gas.

4. The Commission should certify the individual IRPs of the following CCAs: Desert Community Energy, Peninsula Clean Energy Authority, Redwood Coast Energy Authority, and Solana Energy Alliance.

5. The Commission should not approve the individual IRPs of the following ESPs, pending them resubmitting information about the criteria pollutant emissions associated with generation to serve their load: Constellation NewEnergy and Shell Energy.

6. The Commission should not certify the individual IRPs of the following CCAs, pending them resubmitting information about the criteria pollutant emissions associated with generation to serve their load: Apple Valley Choice Energy, Clean Power Alliance of Southern California, CleanPower San Francisco, East Bay Community Energy, King City Community Power, Lancaster Choice Energy, Marin Clean Energy, Monterey Bay Clean Power Authority, Pico Rivera Innovative Municipal Energy, Pilot Power Group, Pioneer Community Energy, Rancho Mirage Energy Authority, San Jacinto Power, San Jose Clean Energy, Silicon Valley Clean Energy Authority, Sonoma Clean Power Authority, and Valley Clean Energy Alliance.

7. The Commission should require the entities that did not provide adequate information about criteria pollutants associated with serving their load to refile this supplemental information associated with their individual IRPs via Tier 2 Advice Letter by no later than June 14, 2019. The information may be filed as an appendix or supplement to the August 2018 individual IRPs.

8. The Commission should approve the request of Liberty Utilities (CalPeco Electric) to conduct a solicitation for replacement power in a short-term bridging arrangement and file the resulting contract(s) as a Tier 2 Advice Letter, with cost allocation details to be handled in its next upcoming energy cost adjustment clause proceeding.

9. The Commission should require LSEs in their individual IRPs in the future to distinguish contractual obligations and development status of individual

resource choices within their portfolios. LSEs should also be required to provide the first round of this information to Commission staff no later than August 16, 2019. Such information may be filed confidentially, subject to the Commission's confidentiality rules, if requested by the individual LSE.

10. The Commission should not adopt the hybrid conforming portfolio as the preferred system plan, because it does not meet the GHG emissions goals or the RPS requirements in 2030, and also represents a less reliable portfolio than the RSP adopted in D.18-02-018, as updated to reflect the 2017 IEPR assumptions.

11. The Commission should update the RSP adopted in D.18-02-018, with adjustments to reflect the 2017 IEPR assumptions and including an assumption of a 40-year life for fossil-fueled resources.

12. The updated RSP, with adjustments to reflect the 2017 IEPR assumptions, including an assumption of a 40-year life for fossil-fueled resources, and reflecting the most updated information about transmission availability and cost of upgrades gleaned from the most recent TPP, should be adopted as the preferred system plan for 2019.

13. The Commission should recommend to the CAISO that the PSP adopted in this decision should be its reliability base case and policy-driven base case for its 2019-20 TPP.

14. The Commission should recommend that the CAISO study, as its policy-driven sensitivity cases, two distinct portfolios representing: a heavily in-state renewable development future and a portfolio based on reliance on out-of-state wind, primarily from New Mexico and Wyoming.

15. The Commission should continue to examine GHG emissions, reliability, and cost issues, as well as criteria pollutants and impacts on disadvantaged communities, on an integrated basis in the IRP process.

16. The Commission should require each LSE to comply with Conclusion of Law 27 and Ordering Paragraphs 12 or 14 of D.18-02-018 in the next IRP cycle by submitting a conforming portfolio that utilizes either the GHG Planning Price or meets the LSE's individual GHG Benchmark.

17. The IRP process should continue to focus on all types of resources, including renewables and non-renewables, as well as existing and new resources, including transmission and demand-side resources, in an integrated manner.

18. The Commission should continue to explore the ability of and facilitate the development of new generating, non-generating, and hybrid technologies to provide ramping, load following, hourly or intra-hour renewable integration, and ancillary services to decrease renewable integration challenges.

19. The Commission should consider exercising its authority to require long-term commitments to renewable integration resources by CCAs in a new "procurement track" of this IRP proceeding.

20. The Commission should focus a procurement track of the IRP proceeding on the following types of resources: diverse renewable resources in the near term, to reduce reliance on fossil-fueled generation and at levels sufficient to reach the 2030 optimized portfolio, in coordination with the RPS program; near-term resources with load following and hourly or intra-hour renewable integration capabilities; existing natural gas resources at minimal levels consistent with reliability needs; and long-duration storage resources, approached in a technology-neutral manner.

21. The procurement track, in the near term, should focus on backstop procurement needed, in the event that individual LSEs fail to procure the

necessary resources to serve their load and/or committed to in their individual IRPs, as well as procurement that may require collective action by multiple LSEs.

22. The procurement track should also consider development of a type of trigger mechanism for procurement activities, with consideration of the proposal already made by SCE in the proceeding or another similar approach.

23. The Commission should coordinate the procurement track with consideration of a central procurement entity in the context of the resource adequacy proceeding and program.

24. The Commission should maintain its focus on keeping California control over the electricity resource choices to serve load in the state in the retail energy markets.

25. The Commission should continue to utilize an assumption of 2024 and 2025 for retirement of the Diablo Canyon nuclear units in its GHG analysis for meeting the electric sector emissions targets by 2030.

26. The Commission should require each LSE serving load within the PG&E territory to explicitly address in its individual IRP beginning in 2020 its plans to replace the energy associated with the retirement of Diablo Canyon. Each individual plan should also detail the LSE's approach to replacing the characteristics of Diablo Canyon output, particularly flexible baseload and/or firm low-emissions energy.

27. The Commission should implement a citation program to ensure compliance with Public Utilities Code Sections 454.51 and 454.52.

28. The Commission should, in future decisions adopting a PSP and approving or certifying individual LSE IRPs, include a finding as to whether the

LSE has met its GHG benchmark or other indicator of its GHG emissions reduction responsibility.

29. The Commission should require that all LSEs include, in their individual IRPs, conforming portfolios that ensure that they will meet their individual GHG benchmarks.

30. It is reasonable to grant the September 12, 2018 motion of Cal Advocates to file its initial comments under seal.

31. It is reasonable to grant the January 31, 2019 motion of SCE to file its comments on the PSP under seal.

O R D E R

IT IS ORDERED that:

1. The following load serving entities are approved as exempt from the requirement in Decision 18-02-018 to file an individual integrated resource plan in 2018: Anza Electric Cooperative, EnergyCal USA (doing business as YEP Energy), Gexa Energy California, Liberty Power Delaware, Liberty Power Holdings, Plumas Sierra Cooperative, Praxair Plainfield, Surprise Valley Electric Cooperative, and Valley Electric Association.

2. The individual integrated resource plans filed in 2018 in compliance with Decision 18-02-018 are hereby approved for the following investor-owned utilities: Bear Valley Electric Service, Liberty Utilities, Pacific Gas and Electric, PacifiCorp, San Diego Gas & Electric, and Southern California Edison.

3. The individual integrated resource plans filed in 2018 in compliance with Decision 18-02-018 are hereby approved for the following electric service providers: 3 Phases Renewables, Agera Energy, American PowerNet Management, Calpine Energy Solutions, Calpine PowerAmerica CA, Direct

Energy Business, EDF Industrial Power Services, Just Energy Solutions, Regents of the University of California, and Tiger Natural Gas.

4. The individual integrated resource plans filed in 2018 in compliance with Decision 18-02-018 are hereby certified for the following community choice aggregators: Desert Community Energy, Peninsula Clean Energy Authority, Redwood Coast Energy Authority, and Solana Energy Alliance.

5. The following electric service providers' individual integrated resource plans (IRPs) are not approved in this decision and they shall file supplemental numerical information about the criteria pollutant emissions (nitrous oxides and particulate matter) associated with serving the load in their portfolios, in at least the four study years of 2018, 2022, 2026, and 2030, via a Tier 2 Advice Letter no later than June 14, 2019: Constellation NewEnergy and Shell Energy.

6. The following community choice aggregators' individual integrated resource plans (IRPs) are not certified in this decision and they shall file supplemental numerical information about the criteria pollutant emissions (nitrous oxides and particulate matter) associated with serving the load in their portfolios, in at least the four study years of 2018, 2022, 2026, and 2030, via a Tier 2 Advice Letter no later than June 14, 2019: Apple Valley Choice Energy, Clean Power Alliance of Southern California, CleanPower San Francisco, East Bay Community Energy, King City Community Power, Lancaster Choice Energy, Marin Clean Energy, Monterey Bay Clean Power Authority, Pico Rivera Innovative Municipal Energy, Pilot Power Group, Pioneer Community Energy, Rancho Mirage Energy Authority, San Jacinto Power, San Jose Clean Energy, Silicon Valley Clean Energy Authority, Sonoma Clean Power Authority, and Valley Clean Energy Alliance.

7. Liberty Utilities (CalPeco Electric) is authorized to conduct a solicitation for short-term electricity resources and file the resulting contract(s) as Tier 2 Advice Letters for Commission consideration. The resulting cost allocation issues, if any, may be handled in its next upcoming energy cost adjustment clause proceeding.

8. All load-serving entities shall provide, by August 16, 2019 informally to Commission staff and thereafter in each subsequent individual integrated resource plan filed, detailed information about the contractual status and development status of each individual electricity resource included in their portfolios.

9. The Preferred System Portfolio shall be based on the Reference System Portfolio adopted in Decision 18-02-018, updated with adjustments to reflect the 2017 Integrated Energy Policy Report assumptions, utilizing a 40-year life assumption for fossil-fueled generation, and updated with the most recent transmission cost and availability information from the California Independent System Operator's 2018-19 Transmission Planning Process and Generation Interconnection Deliverability Allocation Procedures studies.

10. The Commission transmits to the California Independent System Operator (CAISO) for use in its 2018-19 Transmission Planning Process (TPP) the Preferred System Portfolio adopted in Ordering Paragraph 9 above, as both the reliability base case and the policy-driven base case. The Commission also transmits to the CAISO for use in its 2018-19 TPP two distinct portfolios for study as policy-driven sensitivities: one portfolio representing heavily in-state development of renewables and another representing reliance on out-of-state renewables, primarily wind from New Mexico and Wyoming. All portfolios are available at: <http://www.cpuc.ca.gov/General.aspx?id=6442460548>.

11. The Commission hereby institutes a procurement track, to be informed by the planning activities in this proceeding. The procurement track will, in the near term, focus on backstop procurement when individual load-serving entities (LSEs) fail to secure the appropriate resources to serve their load or to meet the commitments outlined in their individual integrated resource plans, as well as procurement that may require collective action by multiple LSEs. The procurement track will evaluate the need for the following types of resources: diverse renewable resources in the near term, to reduce reliance on fossil-fueled generation and at levels sufficient to reach the 2030 optimized portfolio, in coordination with the RPS program; near-term resources with load following and hourly or intra-hour renewable integration capabilities; existing natural gas resources at minimal levels consistent with reliability needs; and long-duration storage resources, approached in a technology-neutral manner. This track will examine resource types as well as the optimal locations for procuring these resources. In addition, the track will examine procurement trigger mechanisms, which may be instituted when certain market conditions are met.

12. All entities serving load within the territory of Pacific Gas and Electric Company shall include in each individual integrated resource plan filed beginning in 2020 a section describing its plans to address the retirement of the Diablo Canyon Generation Plant and the characteristics of its energy output, including flexible baseload and/or firm low-emission energy.

13. Each load-serving entity, in its individual integrated resource plan filed beginning in 2020, shall ensure that it submits at least one conforming portfolio

designed to accomplish meeting its individual greenhouse gas emissions benchmark set by the Commission.

14. The September 12, 2018 motion of the Public Advocates at the California Public Utilities Commission to file its comments under seal is granted.

15. The January 31, 2019 motion of Southern California Edison Company to file its comments on the Preferred System Portfolio under seal is granted.

This order is effective today.

Dated _____, at San Francisco, California.