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

<u>**OPENING COMMENTS OF SOUTHERN CALIFORNIA EDISON COMPANY (U 338-E) ON PROPOSED DECISION REGARDING 2019-2020 ELECTRIC RESOURCE PORTFOLIOS TO INFORM INTEGRATED RESOURCE PLANS AND TRANSMISSION PLANNING**</u>

JANET S. COMBS
CATHY A. KARLSTAD

Attorneys for
SOUTHERN CALIFORNIA EDISON COMPANY

    2244 Walnut Grove Avenue
    Post Office Box 800
    Rosemead, California 91770
    Telephone: (626) 302-1524
    E-mail: Janet.Combs@sce.com

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OPENING COMMENTS OF SOUTHERN CALIFORNIA EDISON COMPANY (U 338-E) ON PROPOSED DECISION REGARDING 2019-2020 ELECTRIC RESOURCE PORTFOLIOS TO INFORM INTEGRATED RESOURCE PLANS AND TRANSMISSION PLANNING

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Pursuant to Rule 14.3 of the California Public Utilities Commission's ("Commission's") Rules of Practice and Procedure, Southern California Edison Company ("SCE") respectfully submits its comments on the *Proposed Decision regarding 2019-2020 Electric Resource Portfolios to Inform Integrated Resource Plans and Transmission Planning*, dated February 21, 2020 ("PD").

I.

INTRODUCTION

SCE appreciates the effort of the Commission and its staff over the last fifteen months to develop a recommended Reference System Portfolio ("RSP"), determine an electric sector GHG target for 2030, and develop filing requirements and tools to guide and standardize the development of the individual Integrated Resource Plans ("IRPs") for more than 40 load-serving entities ("LSEs"). The PD adopts a greenhouse gas ("GHG") planning target of 46 million metric tons ("MMT") for the electric sector in 2030[1] and adopts an RSP that includes several modeling changes from the Commission Staff's proposed RSP that was issued on November 6, 2020[2]. The PD also recommends that (1) the previous 2017-18 Preferred System Portfolio ("PSP") with some modifications be studied as the reliability base case and the policy-driven base case by California

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[1] *See* PD at 1, 79-80.
[2] *See* Administrative Law Judge's Ruling Seeking Comments on Comment on Proposed Reference System Portfolio and Related Policy Actions, R. 16-02-007, November 6, 2019, at 14-19.

Independent System Operator ("CAISO") for the 2020-2021 Transmission Planning Process ("TPP"), (2) that the 2019-2020 RSP be adopted as a policy-driven sensitivity case, and (3) that a 30 MMT scenario be adopted as a second policy-driven sensitivity case.[3]

As detailed below SCE continues to have significant concerns that the proposed 46 MMT planning target will not put the electric sector on an appropriate path to meeting California's Senate Bill ("SB") 32 goals for GHG reduction by 2030 and SB 100 goals for carbon neutrality by 2045. With only 10 years to meet California's first significant decarbonization milestone, the 2019-2020 IRP must send a clear signal to our industry and others that the electric sector will be the engine for economy-wide decarbonization in California. Planning to a 46 MMT target for 2030 puts California at risk of not setting a feasible and least-cost path to meeting the necessary GHG reduction targets through 2045. All of Energy Division's 2045 framing studies, including high electrification, high hydrogen and high biofuels, show the need for electric sector GHG emissions to be lower than 46 MMT and exceed the 60% RPS SB 100 requirement.[4] Both SCE's *Pathway 2045*[5] and California Energy Commission's ("CEC") *Deep Decarbonization in a High Renewables Future*[6] show that reaching California's deep decarbonization goals is feasible, but will require a significant restructuring in the state's energy mix with a clean electric grid serving as a foundation for powering this decarbonized future. Reaching these longer-term goals requires the electric sector reaching between 30 and 38 MMT of GHG emissions by 2030.[7] For this IRP cycle, the Commission should adopt a 38 MMT 2030 GHG planning target as an interim goal to ensure that Commission-jurisdictional LSEs are on the right path to meeting California decarbonization objectives.

Despite planning to the higher 46 MMT target, the new RSP is deficient and incomplete because it does not meet some of its fundamental objectives. The new RSP does not meet the proposed 46 MMT GHG target as shown in the SERVM production cost modeling results where the

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[3] *See* PD at 8, 81.
[4] *See* 2019-2020 IRP: Preliminary Results, CPUC Energy Division, October 4, 2019, at 122.
[5] SCE's Pathway 2045 whitepaper can be found at: https://www.edison.com/home/ourperspective/pathway-2045.html.
[6] *See* Deep Decarbonization in a High Renewables Future, CEC-500-2018-012, June 2018, at 3. Link to the study: https://www.ethree.com/wp-content/uploads/2018/06/Deep_Decarbonization_in_a_High_Renewables_Future_CEC-500-2018-012-1.pdf
[7] *See* 2019-2020 IRP: Preliminary Results, CPUC Energy Division, October 4, 2019, at 122.

expected GHG emissions from the portfolio is closer to 50 MMT. The RSP is also not reliable – the LOLE exceeded 0.1 reaching 0.113 and 0.108 in 2026 and 2030, respectively.[8] SCE recommends that the Commission require staff to revise the new RSP so that at minimum, the updated portfolio meets the GHG targets adopted in this PD and satisfies the 0.1 LOLE standard each year in SERVM. The RSP revision can be combined with the RSP update to incorporate the 2019 IEPR demand expected in the upcoming months. SCE does agree with many of the PD's modifications to the RSP including enforcing 6.5 GW resource adequacy ("RA") capacity import limits in the Strategy Energy Risk Valuation Model ("SERVM") and allowing RESOLVE to select the most appropriate resources to fill the 2,000 MW of generic effective capacity need identified in previous loss of load expectation ("LOLE") modeling of the RSP issued on November 6, 2019. However, SCE has concerns with some of the more recent and unsubstantiated changes to the models that results in a selection of pumped hydro resources and out-of-state wind. While SCE does not object to the inclusion of these resources to diversify the resource mix in the RSP, SCE has concerns with the lack of sufficient explanation for why these resources were selected in the new RSP and lack of a sufficient opportunity to review these changes prior to adoption of the RSP.

Despite these deficiencies, SCE does not oppose the recommendation in the PD to adopt the new RSP at this time on an interim basis, only because the new RSP identifies potential system capacity shortfalls in meeting planning reserve margin ("PRM") requirements in the 2024 through 2026 timeframe.[9] It highlights the need for LSEs to start planning now to include new system capacity resources in their individual IRPs and avoid future unplanned reliability procurement, such as that required by D.19-11-016, which ordered 3,300 MW of system RA procurement by 2023. However, to ensure that LSEs are appropriately planning for system reliability needs as demonstrated by the new RSP, SCE recommends that the Commission clarify its filing requirements and incorporate planning standards for LSEs to demonstrate how they will contribute to meeting PRM needs identified in the RSP throughout the planning horizon. Further, it is important that the Commission also develop a framework for ensuring that LSEs are making progress toward meeting their obligation to bringing the needed resources online.

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[8]   *See* Ruling at 38, Table 7.
[9]   *See* RESOLVE_Results_Viewer_2020-02-07.

While this IRP cycle could not produce an RSP that could be used by the CAISO in the TPP reliability and policy base cases, SCE also does not object to providing the updated 2017-2018 PSP to CAISO for reliability and policy base cases for the TPP. SCE does have concerns, however, that the 2017-2018 PSP does not reflect the PRM needs that resulted in the Commission's D.19-11-016 ordering 3,300 MW of system RA procurement by 2023, does not reflect future PRM needs in 2024 through 2026 identified in the new RSP, and therefore may not include enough system capacity to reliably meet those needs. SCE recommends that the Commission make it a high priority to work with the CAISO and other stakeholders to determine how future RSPs can be developed with enough robustness and certainty in future resource placement that the CAISO can use the RSPs in subsequent TPP base studies.

Finally, SCE recommends the Commission begin a process to restructure the IRP in order to develop a more robust RSP for the next cycle. SCE recommends that part of this restructuring include changes to the IRP process to allow for a more robust stakeholder review and time for Commission staff to consider and incorporate stakeholder feedback. Additionally, because SCE and other parties in this proceeding have identified modeling challenges and deficiencies, the Commission should evaluate the use of capacity models that are more widely used in the power planning industry. Finally, SCE recommends closer collaboration with CAISO in developing the RSP and consider leveraging the CAISO's expertise in production cost modeling, reliability analysis, and system planning in order to support the development of more robust and reliable future RSPs suitable for use in CAISO's TPP process.

II.

A 46-MMT GHG PLANNING TARGET DOES NOT ENABLE THE STATE'S ELECTRIC SECTOR TO REASONABLY PLAN TO ACHIEVE CALIFORNIA'S DECARBONIZATION GOALS

California is 10 years away from needing to reach its ambitious GHG reduction targets codified in SB 32. For California to reach these and longer-term carbon neutrality objectives,[10] the Commission must utilize the IRP proceeding to put the electric power sector on a deliberate decarbonization trajectory so that it can be used to further decarbonize California's heavy emitting

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[10] *See* Exec. Order B-55-18 (2018).

sectors. Both SCE's *Pathway 2045* whitepaper and Commission staff's 2045 Framing Study show that to achieve the longer-term decarbonization goal feasibly and affordably by 2045 a lower electricity sector GHG target ranging from 30-38 MMT is needed. Setting a 46 MMT target puts California at risk for not meeting its GHG reduction goals and misses a much-needed opportunity to ensure all LSEs, and the state as a whole, are planning to make the investments needed to build a cleaner California. Setting a GHG target approximately 10 MMT too high in the electric sector means that not only will other sectors (e.g., transportation, buildings) need to make up the difference with more expensive abatement alternatives, but the sectors that are decarbonizing through electrification will have less carbon reduction impact for each option.

While the PD recommends that a 46 MMT GHG target for 2030 is still appropriate, SCE acknowledges and appreciates that the Commission, "reserves the right to revisit this conclusion in the next IRP."[11] However, planning for the level of clean resources and grid investments needed through 2030 and beyond is necessary now and should span over the next decade rather than accumulate at the end of the decade. It is critical to get the target right at the onset – the longer insufficient targets to meet California's GHG objectives are being used, the greater the challenge becomes to feasibly and affordably reach the state's environmental goals. The PD notes that the 46 MMT target will "likely become harder for the electric sector to achieve should electric loads increase more than previously expected in the coming dec[a]de, such as through more electrification of transportation and buildings."[12] However, increased deployment of energy efficiency and other types of load management would likely offset much of that load growth and the IRP should focus more efforts on how demand-side resources can be used to help the electric sector support achievement of California's ambitious goals. Setting an IRP that considers both supply-side and demand-side resources would enable the electric sector to be the foundation of a cleaner California and lead the way to affordably decarbonize the state.

SCE urges the Commission to adopt a 38 MMT GHG planning target for 2030 for all LSEs in the 2019-20 IRP. This lower GHG target aligns with Commission staff's 2045 Framing Study, CEC's Deep Decarbonization in a High Renewables Future Study, and SCE's Pathway 2045. Also, it is achievable and puts California on a more optimal and feasible trajectory of GHG reduction. If

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[11]   *See* PD at 26.
[12]   *See id* at 2.

the 46 MMT target is nonetheless adopted for the 2019-20 IRP, SCE recommends that the Commission clarify that LSEs may plan to a lower target in their IRPs.

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III.

<u>REFERENCE SYSTEM PLAN MODELING ISSUES SHOULD BE RESOLVED TO PRODUCE AN OPTIMIZED PLAN THAT MEETS THE GHG GOALS AND IS RELIABLE</u>

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SCE has significant concerns with the new RSP in the PD because it *does not meet* the 46 MMT target that is currently proposed for the electric sector based on the SERVM results[13] and the LOLE does not meet the 0.1 criteria for reliability in 2026 or 2030 as shown in Table 7.[14] The SERVM and RESOLVE results show that the new RSP has 51.1 MMT and 46.8 MMT of California-wide GHG emissions in 2030, respectively. Furthermore, there is a 4 MMT gap between the 2030 GHG emissions in RESOLVE and SERVM that remains unfounded. It is critical to ensure close calibration between the capacity expansion model and production cost model because production cost models are more detailed models used as a check on operability, reliability, and emissions results of the resource portfolio developed by less detailed capacity expansion models. The PD RSP's LOLE indicates that more capacity may be needed on the system to ensure the system is reliable. However, the new RSP in the PD also maintains nearly all the gas-fired generation resources in the system, which are needed for reliability. The modeling appears inconsistent and contradictory.

Despite these concerning results, SCE is not opposed to adopting the new RSP in the PD on an interim basis, given the limited time for LSEs to develop their individual IRPs. At a minimum, the new RSP indicates to LSEs that there are new system capacity needs in the 2024-2026 timeframe. Moreover, the new RSP can be used to ensure that LSEs demonstrate how they plan to meet system capacity needs in their IRPs. As described in Section V, it is critical that the Commission adopt effective planning requirements that ensure LSEs are sufficiently planning for capacity to meet PRM needs in this next decade to ensure LSEs are planning for and bringing enough resources online to meet the energy needs of California customers.

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[13]   *See id* at 38.
[14]   *See id*.

If the Commission adopts the new RSP on an interim basis, the Commission staff should be required to update the new RSP in the PD to achieve a 0.1 LOLE each year of the planning horizon and achieve the adopted GHG by 2030 concurrently with Commission staff's update of the new RSP to incorporate the 2019 IEPR demand forecast.

Despite these fundamental issues, however, SCE agrees with some of the modeling results including the identification of several PRM constraints throughout the modeling time horizon and many of the modeling changes staff incorporated into the new RSP in the PD as a result of parties' comments on the November 6, 2019 Ruling.[15]

In terms of the modifications made to the RSP, SCE supports the change to add 2,000 MW to the PRM constraint beginning in 2026 in order to adjust the proposed portfolio to optimally select incremental resources needed to prevent LOLE violations. This approach is more appropriate than simply specifying 2,000 MW of "generic effective capacity." SCE also recommends the Commission adopt the improvements to align the simultaneous import constraint during peak load hours in SERVM and the RA import constraint in RESOLVE.

SCE also supports the PDs recommendation to exclude once-through cooling extension units and 3,300 MW of reliability procurement from the baseline list of resources in the capacity expansion model recognizing the value of having the capacity expansion model select resources to fill those needs with approximately 3,300 MW of battery storage through 2024 along with solar, wind, and shed DR resources. Additionally, the RSP correctly shows a potential system capacity need to meet system PRM in 2024-2026. Therefore, SCE recommends the Commission adopt these changes as well.

However, SCE disagrees with how some of the modifications were implemented and with the incorporation of some of the recent modifications to inputs and assumptions that cause questionable resource selections to occur. SCE reiterates that the import RA limits should be set at 6,937 MW, which includes Hoover, Palo Verde, and Intermountain because a maximum of 5,000 MW import limit is too conservative.[16] Using an RA import limit that is too conservative likely

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[15]   Administrative Law Judge's Ruling Seeking Comment on Proposed Reference System Portfolio and Related Policy Actions, November 6, 2019.

[16]   SCE Opening Comments on Administrative Law Judge's Ruling Seeking Comment on Proposed Reference System Portfolio and Related Policy Actions at 25-26.

results in the capacity expansion model building more in-state capacity than is needed. Therefore, SCE recommends that the PD modify the import RA limits to 6,937 MW.

Additionally, SCE reiterates that the battery effective load carrying capability ("ELCC") modeling in RESOLVE inaccurately penalizes the capabilities of battery storage to support reliability.[17] The supporting study for battery ELCC by Astrape Consulting exclusively focused on 4-hour duration storage and as a result, the study finds that adding more 4-hour storage exclusively provides diminishing reliability benefits. That characterization from the Astrape study does not, however, reflect the cost-duration tradeoff constructed in the RESOLVE model's objective function. The results of the Astrape study cannot be extended to all durations. Given the significant impacts these ELCC curves may have on the capacity of energy storage, SCE recommends a more thorough study and stakeholder review process prior to adopting Astrape's ELCC curves for energy storage in the RSP modeling in the PD.

RESOLVE also appears to be uneconomically selecting 12-hour duration pumped hydro when lower-priced, shorter-duration, storage may meet the capacity needs of the system. Using a lower ELCC value for 4-hour battery storage and increasing the RA requirement by 2,000 MW starting from 2026 for the RSP in the PD may have contributed to the long-duration storage buildout. However, it is not economical to select 973 MW of pumped storage when the cost of long-duration battery storage is lower than the pumped storage costs. The RSP in the PD can replace the pumped storage buildout at $214/kW-yr with the long duration (9-hr) battery at about $100/kW-yr, making the portfolio more economical. Although SCE supports resource diversity in the RSP, SCE does not recommend the Commission require LSEs to plan for specific types of resources. Instead, it should require LSEs to show how they are planning for resource diversity in their portfolios.

IV.

CONCERNS WITH PORTFOLIOS FOR TPP

The PD recommends providing the 2017-2018 PSP, with modifications, to the CAISO as the reliability and policy-driven base case for the 2020-2021 TPP and to request the CAISO study the

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[17]   *Id* at 12.

adopted 2019-2020 RSP as a policy-driven sensitivity.[18] Ideally, the adopted 2019-2020 RSP should be used in the reliability and policy-driven base case for the upcoming TPP, but due to the uncertainty of the locations for future renewables and energy storage in the proposed 2019-2020 RSP, the CAISO does not recommend to use either the 46 MMT Alternate Scenario[19] or the adopted 2019-2020 RSP.[20] For this reason, SCE supports the use of the updated 2017-2018 PSP for the upcoming TPP. However, the 2017-2018 PSP should be updated to reflect recent generation retirements in the resource baseline. Additionally, SCE cautions that the 2017-2018 PSP may no longer be deemed a reliable portfolio because it was not built with the same import RA and simultaneous energy constraints as the proposed 2019-2020 RSP. The 2017-2018 PSP, therefore, did not identify the near term PRM needs that led to the 3,300 MW of procurement in D.19-11-016, and it similarly did not identify any capacity needs in 2024 -2026 or build sufficient capacity to meet those needs.

The PD also recommends the CAISO study the adopted 2019-2020 RSP as a policy-driven sensitivity case to help identify where policy-driven transmission needs occur.[21] For its TPP process, the CAISO requires a level of certainty of the locations of resources including the large quantity of energy storage for its transmission impact analysis. Lack of locational information can delay these resources from coming online as the development of transmission lags behind, putting the state at risk for meeting its future decarbonization goals. SCE recommends that the Commission prioritize and finalize a methodology with input from CAISO and stakeholders for resource placement with a level of certainty sufficient for the upcoming 2019-2020 PSP for use in the 2020-2021 TPP as the reliability and policy-driven base case rather than as sensitivities.

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[18] PD at 62.
[19] As defined in the Administrative Law Judge's Ruling Seeking Comment on Proposed Reference System Portfolio and Related Policy Actions.
[20] PD at 56-57.
[21] *Id* at 62-63.

V.

IRP FILING REQUIREMENTS SHOULD CLARIFY HOW LSES' IRPS WILL MEET FUTURE SYSTEM CAPACITY NEEDS

SCE supports most of the Staff's proposed changes to the filing requirements and incorporation of planning standards to help facilitate more standardized and consistent planning among the LSEs.[22] Planning standards and requirements can help ensure that all LSEs are planning to equitably contribute to meeting system reliability needs throughout the IRP planning horizon. However, it is unclear in the PD whether any of the proposed planning standards, including reliability assessments, will be adopted. Therefore, SCE recommends that the Commission adopt a modified version of the proposed reliability assessment as described below to support evaluation of LSEs' plans in their IRPs to meet their share of system capacity needs identified in the new RSP through 2030. SCE also requests that the Commission clarify which other planning standards will be adopted. Timely adoption of these requirements is critical to ensure delivery of effective IRPs by July 1, 2020.

As stated above, SCE supports approving the new RSP in the PD on an interim basis despite SCE's aforementioned concerns and agrees with the PD's findings that there is a need for new system capacity to meet near term PRM needs through 2023 and additional PRM needs through 2026 and beyond.[23] The new RSP solves for these needs by building 3,299 MW of battery storage by 2024, and 2,828 MW of battery storage and 973 MW of pumped hydro by 2026,[24] although some of that storage may also be needed to meet GHG constraints. The procurement requirement in D.19-01-016 will help mitigate the near-term PRM need, however, LSEs should start planning now for meeting the additional system capacity needs in the 2024-2026 timeframe. A reliable RSP is crucial to determining the potential system need, however, without setting minimum planning requirements for LSEs, the importance of the RSP in the overall IRP process is diminished. The Commission should adopt clear requirements for LSEs to plan for their respective contributions to meeting those PRM needs in their individual IRPs to avoid a rushed and cost-inefficient procurement process for new system capacity. Additionally, SCE recommends that the Commission

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[22] ALJ's Ruling Seeking Comments on Filing Requirements for 2020 Integrated Resource Plans.
[23] *See* RESOLVE_Results_Viewer_2020-02-07.
[24] PD, Table 5, p. 35.

not accept IRPs that lack resources needed to meet the PRM needs. SCE also requests that the Commission clarify the process and requirement for LSEs to start procurement to bring resources online to meet reliability needs after 2023 and initiate a process to develop a compliance framework to ensure that LSEs are making progress towards meeting their obligation to bring needed resources online.

Through further review of the System Capacity Requirement Planning Standards proposed by Staff,[25] this planning standard may not effectively address the PRM shortfall issues that might arise. Staff's proposal is to "compare planned and contracted or owned capacity reported in LSE Plans, individually and in aggregate, against each LSE's assigned share of peak electric demand, in order to characterize the potential for capacity shortfall throughout the IRP planning horizon. Staff proposes this be an annualized analysis in which the annual peak demand is compared to the sum of August contracted and planned RA capacity."[26] This approach may not capture emerging system reliability issues. For example, as the system peak moves later in the evening due to the proliferation of behind-the-meter solar, if LSEs use the average or marginal ELCC for solar, the capacity contribution for solar would be overestimated, which would in turn underestimate the need for capacity at those evening hours. This highlights that it is problematic to use a fixed ELCC value for wind and solar[27] during any hour that the system peak may occur.[28] SCE recommends that system reliability assessments include a comparison of the LSE's baseline resources (owned, contracted, and planned) to the forecasted annual *net load peak* plus a 15% PRM (i.e., peak load minus all wind and solar resources) based on each LSE's hourly forecast as adopted in the 2019 IEPR and adjusted as finalized by the Commission.[29] LSEs should provide this showing for each year throughout the IRP forecast horizon.

In order to ensure equitable access among LSEs to existing system capacity that is not under a long-term contract and equitable allocation of LSEs' responsibility to bring new system capacity online, SCE recommends that for the purposes of this reliability analysis, LSEs assume they have

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[25] Staff Proposal on Filing Requirements for the 2019-2020 IRP Cycle at A-30 to A-32.
[26] *See* Id.
[27] Expected wind and solar energy to be subtracted from the net load peak could be estimated using the wind and solar profile of the month in question from either the RESOLVE or SERVM datasets.
[28] SCE Opening Comments on Administrative Law Judge's Ruling Seeking Comment on Proposed Reference System Portfolio and Related Policy Actions, December 17, 2019 at 9.
[29] Administrative Law Judge's Ruling Allowing Updated Load Forecasts, January 24, 2020 at 4.

access to their load share of existing resource capacity in the market that is not under long-term contract. As LSEs get closer in time to procuring the new resources, this planned procurement needs to become a binding requirement for LSEs. Close coordination between the IRP and RA proceedings is needed to carefully manage procurement obligations for new resources to meet longer-term needs and to manage procurement and contracting for the existing system resources.

LSEs should provide this showing for each year throughout the IRP forecast horizon. Each LSE should include a summary table that captures their reliability assessment similar to the Staff's example summary,[30] except each LSE would be comparing their resources to their individual net load peak as described above and not use "system RA planning targets". LSEs would highlight how much capacity they would add to the system during the years that the RSP shows a PRM need (i.e., 2020, 2021, 2023, 2024, 2026, 2027, and 2030). The Commission staff would then aggregate each individual IRP and compare the total baseline and planned system capacity positions against the PRM needs identified in the RSP to make a final determination on system reliability. However, more capacity may be needed than is built in RESOLVE because the RSP exceeded a 0.1 LOLE standard in 2026 and 2030.

A fundamental purpose of the IRP process is to ensure that LSEs are planning for adequate resources to meet system needs and the state's decarbonization goals. A reliable RSP is crucial to determining the potential system capacity needs, however, without LSE requirements to meet needs identified in RSP, the RSP loses significance and the IRP process will fall short of this important objective.

VI.

CLEAN SYSTEM POWER CALCULATOR UNDERESTIMATES GHG EMISSIONS

The latest Clean System Power calculator ("CSP") understates GHG emissions relative to both RESOLVE and SERVM GHG emissions. As noted in the table below, the CSP calculates 35.7 MMT as the 2030 CAISO-wide GHG emissions. In comparison, the RESOLVE and SERVM 2030 CAISO-wide GHG emissions from the new RSP are 37.9 and 41.4 MMT, a difference of 2.2 and 5.7 MMT, respectively. The CSP also results in lower GHG emissions in 2022 and 2026. Because the CSP inputs utilize SERVM results, SCE expected that the calculated CSP GHG emissions

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[30]   Staff Proposal on Filing Requirements for the 2019-2020 IRP Cycle at A-31.

would be closer to the SERVM GHG emissions. Ultimately, SCE is concerned that an LSE validating its portfolio solely using the CSP will understate its GHG emissions. More importantly, any aggregation process using LSE portfolios with understated GHG emissions would threaten a successful PSP process. SCE strongly recommends the CPUC revisit the current CSP calculator and update the tool to produce results in alignment with SERVM.

Reported GHG Emissions (MMT) by Model or Calculator

	2022	2026	2030
CSP	30.5	36.6	35.7
RESOLVE	37.7	41.0	37.9
SERVM	38.0	43.8	41.4

VII.

PROCESS AND TECHNICAL IMPROVEMENTS SHOULD BE IMPLEMENTED TO ENSURE FUTURE DEVELOPMENT OF A MORE ROBUST REFERENCE SYSTEM PORTFOLIO

The RSP is a foundational component of the IRP. A key objective of the IRP proceeding should be to develop a robust, reliable, and optimal RSP that can be used to identify resource needs, allocate those needs equitably so that all LSEs are sufficiently planning to meet their demand, support system reliability, and help decarbonize California's electric power system. SCE recommends needed process and technical modeling improvements to ensure that the future RSPs and IRP process meets these goals.

First, as stated in Section III above, the new RSP does not meet reliability standards, does not meet the GHG goals proposed by the Commission, and makes uneconomic resource selections. Additionally, the new RSP cannot be used as the base reliability or policy case in the CAISO's TPP due to the volatility in selected resource placement and lack of placement of energy storage resources in the RSP.[31] Many of the most recent modeling changes have been incorporated into this PD without allowing parties sufficient time to review and comment on the analysis. Some of these

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[31] CAISO Opening Comments on Administrative Law Judge's Ruling Seeking Comment on Proposed Reference System Portfolio and Related Policy Actions, December 17, 2019, at 1-2.

recent changes to effective resource capacity or costs have been made without sufficient support or stakeholder feedback and have led to the selection of previously unselected resources (i.e. out of state wind and pumped hydro) in the new RSP. The lack of time for providing and incorporating feedback has been a challenge throughout the 2019-2020 IRP RSP development process which has led to a deficient, incomplete, and uneconomic RSP.

First, SCE recommends that additional time be included in the schedule for development, stakeholder review, and revisions to the RSP. The IRP process should ensure that other stakeholder model findings are compared to staff's draft RSPs and used to inform the final RSP. SCE was the only party to conduct independent modeling of the proposed RSP and SCE was able to meet a 38 MMT electric sector emissions target while building a similar amount of resources that were included in Staff's Alternate RSP modeled to meet a 46 MMT target.[32] The PD does not address many of the findings, recommendations, and analyses SCE presented on the proposed RSP and it appears that they were largely excluded from the PD's RSP. The IRP process should ideally allow review and comparisons with independent modeling to ensure development of a robust RSP, especially if other modeling resulted in a more economical RSP. SCE proposes at least four months of additional time to accommodate stakeholder review and incorporate feedback into the RSP. The RSP development process may need to be initiated earlier in the IRP cycle in order to incorporate this additional time into the overall IRP schedule.

To help address the modeling challenges experienced in this 2019-2020 IRP cycle, SCE proposes changes to the current process that can be established now to apply for the next IRP cycle. First, SCE recommends the CPUC review other commercially available and more widely used capacity expansion models. SCE and other stakeholders have identified numerous issues with RESOLVE in this and the previous IRP cycle.[33] In a process this critical for electric power sector decarbonization and system reliability planning, SCE supports the use of best available tools. Second, to help better ensure that the RSP meets reliability targets and has stable and reasonable placement of renewables and energy storage, SCE recommends working closely with the CAISO and consider leveraging their expertise in production cost modeling and stochastic reliability

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[32] SCE Opening Comments on Administrative Law Judge's Ruling Seeking Comment on Proposed Reference System Portfolio and Related Policy Actions, December 17, 2019, at 29-32.

[33] SCE Opening Comments on Administrative Law Judge's Ruling Seeking Comment on Proposed Reference System Portfolio and Related Policy Actions, December 17, 2019, p. 7.

modeling. SCE proposes the Commission staff work with CAISO to conduct production cost modeling and reliability testing of the RSP in order to support development of a more robust and reliable RSP that can be used as the reliability and policy base case for the next TPP. Finally, SCE recommends that the Commission develop a need-based allocation methodology in conjunction with planning standards so that LSEs' individual IRPs include a plan for resources with attributes that meet the optimal RSP.

VIII.

CONCLUSION

For all the foregoing reasons, the Commission should adopt the PD with SCE's recommended modifications discussed herein and in Appendix A.

Respectfully submitted,

JANET S. COMBS
CATHY A. KARLSTAD

/s/ Janet S. Combs
By: Janet S. Combs
Attorneys for
SOUTHERN CALIFORNIA EDISON COMPANY

2244 Walnut Grove Avenue
Post Office Box 800
Rosemead, California 91770
Telephone: (626) 302-1524
E-mail: Janet.Combs@sce.com

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Appendix A

SCE's Proposed Changes to the Findings of Fact, Conclusions of Law,

and Ordering Paragraphs of the Proposed Decision

SCE's Proposed Changes to the Findings of Fact ("FOF"), Conclusions of Law ("COL"), and Ordering Paragraphs ("OP") of the Proposed Decision

Proposed text deletions are in **bold and strikethrough**

Proposed text additions are in **bold and underlined**

Reference	Proposed Modifications
FOF 2(a)	**The Clean System Power calculator understates GHG emissions as compared to SERVM.**
FOF 11	Limiting electric sector emissions to 46 MMT in 2030 would put the sector on the straight-line trajectory to achieving estimates of the necessary emissions in 2045 to reach the state's zero-emissions goals set forth in SB 100. **However, the Commission staff's 2045 Framing Study shows that adopting a lower target is optimal in reaching the 2045 goal.**
FOF 14	The Hoover**, Intermountain,** and Palo Verde power plants **should be modeled as CAISO-located resources** ~~provide resource-specific imports~~ and should **not** be included in the import limit specified in RESOLVE for purposes of analyzing the 2019-2020 RSP.
FOF 16. a.	**RESOLVE finds that there are planning reserve margin (PRM) needs in 2020, 2021, 2023, 2024, 2026, and 2030.**
FOF 16. b.	**The SERVM analysis of the RSP shows that it exceeds the proposed GHG targets in 2030 and 0.1 LOLE reliability standards in 2026 and 2030.**
FOF 21	A diverse resource portfolio **using a 30-38MMT GHG target** will help the state reach its 2030 and 2045 GHG goals in a reliable and least-cost manner.
FOF 22	Templates **with planning standards and a reliability assessment** produced by Commission staff for individual IRPs, resource data, and GHG emissions will assist the Commission in reviewing and aggregating the individual IRPs and assembling a quality PSP.

FOF 22.a	**IRP Planning standards can help facilitate standardized and consistent planning among LSEs. A planning standard for LSE reliability assessments will help the Commission ensure individual IRPs plan to contribute to system reliability needs throughout the planning horizon.**
FOF 25	Several updates and improvements to the 2017-2018 PSP are reasonable if it continues to be utilized for CAISO TPP purposes, including updates to the baseline resources **including generation retirements**, updates to the locations of some generation delivering to particular substations, and updates based on commercial interest in the CAISO interconnection queue.
FOF 25.a	**A methodology for resource placement is needed for the 2019-2020 Preferred Resource Portfolio with a level of certainty acceptable for use in the TPP process as the reliability and policy-driven base case rather than as sensitivities.**
FOF 25.b	**The 2017-2018 PSP to be used as the reliability and policy-driven base case for the 2020-2021 TPP may no longer be a reliable portfolio as it did not identify near term PRM needs and its unclear if it identified any longer term PRM capacity needs through 2030.**
COL 3	The RESOLVE and SERVM models ~~were~~ **need further** ~~iteratively~~ **iterative calibration** ~~and appropriately calibrated~~ **to be** sufficient for the Commission's reliance to produce the 2019-2020 IRP cycle analysis of an RSP.

COL 4	It was appropriate to make the following updates, to the inputs and assumptions for 2019-2020 RSP modeling analysis, **documented for review and comment from parties to the R.16-02-007 proceeding**:
	    (a) Updating the load forecasts to align with the CEC's IEPR forecast adopted in 2019.
	    (b) Updating baseline resource assumptions.

	(c) Revising capital cost assumptions for all technologies, as available.
	(d) Adding BTM storage and certain energy efficiency measures as candidate resources to be selected by the RESOLVE model.
	(e) ~~Revising the ELCC values with increasing penetrations of battery storage.~~
	(f) Updating electrical zone boundaries and including multiple concurrent (or nested) limitations identified by the CAISO to delivery energy from renewable resource zones to load centers.
COL 7	It is reasonable for the Commission to adopt an electric sector GHG target in 2030 of **38** ~~46~~ MMT at this time.
COL 14	The LSEs should be required to detail in their individual IRPs their plans for procuring ~~**pumped storage resources, or other long-duration storage resources with similar attributes, and out-of-state wind resources**~~ **a diverse portfolio of resources.**
COL 16	The Commission should delegate to Commission staff the tasks of producing the following items for LSEs to assist in preparation of their individual IRPs: **an updated RSP to meet the GHG target and 0.1 LOLE reliability standard, a** Narrative Template **(with incorporation of filing requirements and planning standards for LSEs to demonstrate how they will contribute to meeting PRM reliability needs identified in the RSP throughout the planning horizon)**, a Resource Data Template, and a Clean System Power Calculator **that does not understate GHG emissions when compared to SERVM**.
COL 20	All LSEs should be required to file Conforming Portfolios that adhere to the assumptions used to form the 2019-2020 RSP

	with the exception that LSEs may use a lower GHG target.
COL 22	The Commission should utilize the 2017-2018 PSP as the reliability and policy-driven base case, with updates as described in this decision, **including updates to the baseline resources to reflect generation retirements,** to forward to the CAISO for purposes of its 2020-21 TPP.
COL 22.a	**2017-2018 PSP may no longer be deemed a reliable portfolio because it was not built with the same import RA and simultaneous energy constraints as the proposed 2019-2020 RSP.**
OP 1	The Commission adopts the greenhouse gas emissions target for the electric sector of **38** ~~46~~ million metric tons in 2030, within the range for the sector established by the California Air Resources Board. The Commission applies this target to the investor-owned utilities, community choice aggregators, electric service providers, and electric cooperatives under its purview for the integrated resource planning process.
OP 3	The **new** Reference System Portfolio identified in the RESOLVE model and adopted by this decision, along with a "no new distributed energy resources" scenario and a Greenhouse Gas Planning Price of $130 per metric ton in 2030, is made available to the integrated distributed energy resource Rulemaking 14-10-003 for use in valuing distributed energy resources and modifying the Avoided Cost Calculator in that proceeding. **An updated Greenhouse Gas Planning Price will be made available when the RSP is updated to meet the GHG targets adopted in this PD and satisfy the 0.1 LOLE standard in SERVM**.
OP 4	The Commission delegates to Commission staff to maintain and provide, via emails to the service list of this proceeding and posting on the Commission's web site, up-to-date versions of the following items, by no later than April 15, 2020 for this cycle, to assist individual load-serving entities in preparing their individual

	integrated resource plans for Commission consideration:
	(a) Narrative Template; **(shall include filing requirements and planning standards for LSEs to demonstrate how they will contribute to meeting PRM reliability needs identified in the RSP throughout the planning horizon.)** (b) Resource Data Template; and (c) Clean System Power Calculator **updated to calculate GHG emission levels consistent with SERVM**.
OP 7	All load-serving entities required to file a Standard Plan and Conforming Portfolio, as defined in Decision 18-02-018, shall detail in their individual integrated resource plans their plans and activities to procure ~~pumped storage resources, or other long-duration storage resources with similar attributes, as well as out-of-state wind resources.~~ **a diverse portfolio of resources.**
OP 8	For purposes of the California Independent System Operator's Transmission Planning Process for 2020-21, the Commission requests the following scenarios be studied, and forwarded by Commission staff with detailed busbar mapping to the extent possible: (a) The 2017-2018 Preferred System Portfolio adopted in Decision 19-04-040, with updates to the baseline and some generation locations as detailed in this decision, **as well as updates to use the baseline resources to reflect generation retirements**, as the reliability base case and the policy-driven base case. (b) The 2019-2020 Reference System Portfolio adopted in this decision as a policy-driven sensitivity. (c) A portfolio based on the 30 million metric ton scenario, to test the impact of energy-only deliverability status for some generators on congestion, as a second policy-driven sensitivity.

OP 11.a	**The Commission staff shall begin a process to restructure the IRP in order to develop a more robust RSP for the next cycle, work with the CAISO and other stakeholders to determine how future RSPs can be developed with enough robustness and certainty in future resource placement that can be used TPP base studies, and develop an allocation methodology in conjunction with planning standards so that LSEs' individual IRPs include a plan for resources with attributes that meet an optimal RSP.**
OP 11.b	**The Commission staff shall establish a process to investigate use of more widely-used capacity expansion modeling software to replace the RESOLVE model in future IRPs.**