STATE OF CALIFORNIA GAVIN NEWSOM, *Governor*

PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
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FILED
03/03/23
03:31 PM
R2110002

March 3, 2023

Agenda ID # 21427
Ratesetting

TO PARTIES OF RECORD IN RULEMAKING 21-10-002:

This is the proposed decision of Administrative Law Judge Debbie Chiv and Administrative Law Judge Shannon O'Rourke. Until and unless the Commission hears the item and votes to approve it, the proposed decision has no legal effect. This item may be heard, at the earliest, at the Commission's April 6, 2023, Business Meeting. To confirm when the item will be heard, please see the Business Meeting agenda, which is posted on the Commission's website 10 days before each Business Meeting.

Parties to the proceeding may file comments on the proposed decision as provided in Rule 14.3 of the Commission's Rules of Practice and Procedure.

The Commission may hold a Ratesetting Deliberative Meeting to consider this item in closed session in advance of the Business Meeting at which the item will be heard. In such event, notice of the Ratesetting Deliberative Meeting will appear in the Daily Calendar, which is posted on the Commission's website. If a Ratesetting Deliberative Meeting is scheduled, *ex parte* communications are prohibited pursuant to Rule 8.2(c)(4).

/s/ MICHELLE COOKE
Michelle Cooke
Acting Chief Administrative Law Judge

MLC:mef
Attachment

Decision **PROPOSED DECISION OF ALJ DEBBIE CHIV AND ALJ SHANNON O'ROURKE (Mailed 3/3/2023)**

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Oversee the Resource Adequacy Program, Consider Program Reforms and Refinements, and Establish Forward Resource Adequacy Procurement Obligations.	Rulemaking 21-10-002

DECISION ON PHASE 2 OF THE RESOURCE ADEQUACY REFORM TRACK

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DECISION ON PHASE 2 OF THE RESOURCE ADEQUACY REFORM TRACK

Summary

This decision addresses issues scoped as Phase 2 of the Reform Track and adopts implementation details for the 24-hour slice-of-day framework, including adopting compliance tools, resource counting rules for various resource types, and a methodology to translate the Planning Reserve Margin to the slice-of-day framework.

This proceeding remains open.

1. Background

On October 7, 2021, the California Public Utilities Commission (Commission or CPUC) issued the Order Instituting Rulemaking (OIR) to oversee the Resource Adequacy (RA) program, consider program reforms and refinements, and establish forward RA procurement obligations applicable to Commission-jurisdictional load-serving entities (LSEs). Additional information on the procedural history of this proceeding is provided in the OIR.

A Scoping Memo and Ruling (Scoping Memo) for this proceeding was issued on December 2, 2021. The Scoping Memo identified the issues to be addressed in this proceeding and set forth a schedule and process for addressing those issues. In addition, the Scoping Memo established two tracks for this proceeding: the Implementation Track and the Reform Track. Under the Implementation Track, the Scoping Memo divided the track into Phases 1, 2, and 3. Issues scoped as Phase 1 of the Implementation Track were addressed in Decision (D.) 22-03-034. Issues scoped as Phase 2 of the Implementation Track and issues scoped as the Reform Track were addressed in D.22-06-050. In D.22-06-050, the Commission adopted Southern California Edison's (SCE) 24-hour slice-of-day (SOD) framework for implementation for the 2025 RA year

and established three workstreams for further development of the SOD framework.

On September 2, 2022, an Amended Scoping Memo was issued that designated issues as Phase 3 of the Implementation Track and Phase 2 of the Reform Track. This decision addresses issues scoped as Phase 2 of the Reform Track.

Working Group meetings were held by parties from July 2022 to October 2022 to address workstream topics identified in D.22-06-050. On November 15, 2022, a RA Reform Working Group Report was submitted by Pacific Gas & Electric Company (PG&E) on behalf of co-facilitators of the Working Group. Co-facilitators of the Working Group are California Independent System Operator (CAISO), California Community Choice Association (CalCCA), California Energy Storage Alliance (CESA), California Large Energy Consumers Association (CLECA), Energy Division, Independent Energy Producers Association (IEP), PG&E, SCE, San Diego Gas & Electric (SDG&E), and Western Power Trading Forum (WPTF).

Opening comments were filed on December 1, 2022 by: American Clean Power – California (ACP-CA); AES Clean Energy Development, LLC (AES); Alliance for Retail Energy Markets (AReM); CAISO; CalCCA; Calpine Corporation (Calpine); California Wind Energy Association (CalWEA); Center for Energy Efficiency and Renewable Technologies (CEERT) and California Environmental Justice Alliance (CEJA) (jointly, CEJA/CEERT); CESA; CLECA; Fervo Energy Company (Fervo); Form Energy, Inc. (Form Energy); Hydrostor, Inc. (Hydrostor); IEP; Middle River Power LLP (MRP); National Resources Defense Council (NRDC); Peninsula Clean Energy (PCE); PG&E; SCE;

Public Advocates Office of the California Public Utilities Commission (Cal Advocates); SDG&E; Solar Energy Industries Association (SEIA); and WPTF.

Reply comments were filed on December 12, 2022 by: ACP-CA; CAISO; CAISO's Department of Market Monitoring (DMM); Cal Advocates; CalCCA; CESA; CLECA; California Efficiency + Demand Management Council (CEDMC); Green Power Institute (GPI); Hydrostor; IEP; MRP; NRDC; OhmConnect Inc. (OhmConnect); PG&E; SCE; and SEIA. The matter for this decision was submitted on December 12, 2022.

2. Issues Before the Commission

The scope of Phase 2 of the Reform Track, as adopted in the Amended Scoping Memo, is summarized below:

1. **Workstream 1**. Develop 24-hour framework compliance tools:
    a. RA Resource Master Database to be coordinated with CAISO.
    b. LSE Showing Tool (template to be used by the LSE to make its filing to the Commission) and Commission Verification Tool (tool to be used by Energy Division to verify compliance).
    c. LSE Requirement Database to be coordinated with the California Energy Commission (CEC). This will utilize outputs generated by the CEC's load forecast proposal, including a dry run filing that may inform any necessary changes.
    d. Cost Allocation Mechanism (CAM) process and RA allocation to consider availability and capability of CAM-eligible resources and LSEs' load share during those slices.
2. **Workstream 2**. Determine Planning Reserve Margin (PRM) and Counting Rules:

a. Appropriate exceedance level and/or hourly profiles for wind and solar at technology and location level.

b. Counting rules for hybrid, co-located, and long-duration energy storage resources, as well as development of an unforced capacity evaluation-light (ambient derate) mechanism to be applied to dispatchable resources.

c. Elimination of the maximum cumulative capacity buckets.

d. Test year details.

e. Appropriate PRM with single PRM initially for all months and hours informed by a loss of load expectation study, including National Resources Defense Council's calibration tool.

    i. The Reform Track will consider how to convert/calibrate the results of a loss of load expectation study (LOLE) study to the slice-of-day RA framework. Therefore, "appropriate PRM" in the Reform Track refers to converting the LOLE modeling results to the hourly RA framework counting rules.

3. **Workstream 3**. CAISO and Commission Validation and Compliance:

    a. Confirm elements of CAISO and Commission validation and compliance that do not require modification in the near term.

    b. Identify and resolve administrative changes to the RA program at both CAISO and the Commission (*e.g.*, must offer reporting, outage substitution).

    c. Elimination of the flexible RA requirements.

4. Consider the allocation of funding to assist with the implementation of the 24-hour slice framework, including funds for a compliance filing portal and external facing user interface.

All proposals and comments submitted in Phase 2 of the Reform Track were considered. Given the length and detail of the Working Group Report, as well as the volume of comments, some proposals or comments may receive little or no discussion in this decision. Issues within the scope of the proceeding that are not addressed or only partially addressed in this decision may be addressed in a future phase.

3. Background and Overview of RA Reform

In D.21-07-014, the Commission outlined the history of the current RA framework and the trends and concerns that have arisen, which resulted in the reexamination of the RA program to ensure that the framework can provide grid reliability at all times of the day.[1] The Commission established five key principles for a new RA framework that encompass the concerns with the current framework and emphasize the objectives of the RA program, set forth in Public Utilities (Pub. Util.) Code Section 380. The principles are as follows:[2]

- Principle 1: To balance ensuring a reliable electrical grid with minimizing costs to customers.
- Principle 2: To balance addressing hourly energy sufficiency for reliable operations with advancing California's environmental goals.
- Principle 3: To balance granularity and precision in meeting hourly RA needs with a reasonable level of simplicity and transactability.
- Principle 4: To be implementable in the near-term (*e.g.,* 2024).
- Principle 5: To be durable and adaptable to a changing electric grid.

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1 *See* D.21-07-014 at 5-7.

2 Further detail on each of these principles can be found in D.21-07-014 at 25-28.

In D.21-07-014, the Commission concluded that PG&E's SOD proposal best addressed the principles and concerns with the current framework and was best positioned to be implemented for the 2024 RA year, if further developed.[3] Parties undertook workshops to develop a final restructuring proposal based on PG&E's SOD proposal. In D.22-06-050, the Commission considered proposals on the structural reform framework and specific elements. The Commission determined that SCE's 24-hour SOD proposal best satisfied the principles and objectives identified in D.21-07-014 and was to be further developed in workshops.[4] The Commission provided guidance on elements of a SOD framework and determined that a 2024 test year would provide time for implementation and adjustments, with full implementation in the 2025 RA year.

After extensive Working Group meetings, co-facilitators submitted a RA Reform Working Group Report (WG Report) on November 15, 2022. The Commission acknowledges the substantial, thorough discussion undertaken by Working Group participants. The Commission particularly recognizes and appreciates the effort put forth by the co-facilitators to lead and develop the WG Report proposals, especially given an expedited timeframe. We consider proposals put forth in the WG Report in this decision.

4. Workstream 1. Compliance Tools

In D.22-06-050, the Commission directed parties to develop compliance tools to implement the 24-hour SOD framework. Workstream 1 consisted of developing the following:[5]

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[3] D.21-07-014 at 38. A detailed description of PG&E's slice-of-day proposal can be found in D.21-07-014 at 12-16.

[4] D.22-06-050 at 76.

[5] *Id*. at Ordering Paragraph (OP) 27.

a. RA Master Resource Database to be coordinated with CAISO;

b. LSE Showing Tool and Compliance Verification Tool;

c. LSE Requirement Database to be coordinated with the CEC; and

d. CAM process and RA allocation to consider availability and capability of CAM-eligible resources and LSEs' load share during those slices.

4.1. RA Master Resource Database

In D.22-06-050, Appendix A, the Commission described the RA Master Resource Database (MRD)[6] as follows:[7]

> The Commission will maintain an official database of resources eligible to sell RA that includes their key attributes, as listed below [MRD]. Resources must be fully represented in the RA [MRD] to be eligible for use in the Commission's 24-hour slice RA showing. The database shall include:
>
> - Resource ID;
> - Available MW of RA capacity;
> - Hours available for production—represents the hours of its must-offer obligation and will set the parameters on how it can be shown in the Commission's RA showing;
> - Other use-limitations (*e.g.*, peaker permit limits);
> - Continuous MWh run energy and charging efficiency (storage);
> - Configurations (hybrid and co-located);
> - Applicable hourly profile for solar and wind; and
> - Additional parameters as identified through workstreams.

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[6] Resource Master Database and Master Resource Database have been used interchangeably during the Working Group process. For consistency, the database will hereinafter be referred to as the Master Resource Database or MRD.

[7] D.22-06-050, Appendix A at 5.

The Commission further specified the following regarding the MRD:[8]

- Contains a list of all resources (within the CAISO) eligible to sell RA, their resource ID, their maximum RA capacity, and hours of availability within a 24-hour window;
- For solar and wind, identifies the profile associated with the resource;
- For storage, includes the charging efficiency and maximum continuous energy;
- For hybrid and co-located resources, includes configurations to describe capabilities;
- Contains data for each month; and
- Information is public and available to inform trading and resource portfolio development.

The Commission stated that it "will coordinate with CAISO to the greatest extent possible to utilize the same unit information used by CAISO in its market operations (*e.g.*, aligned with CAISO's Master File)."[9]

Energy Division proposes a MRD that would use public data sources and default values to populate the database, rather than CAISO's Master File, which introduces confidentiality issues and administrative complexity to track scheduling coordinator and generation owner affirmations.[10] The MRD would be published on the Commission's website and sent to the service list with a request to generators to respond with corrections, similar to the Net Qualifying Capacity (NQC) process. Feedback from suppliers would be incorporated into the database and compared to information in CAISO's Master File. Energy Division would contact suppliers for corrections for any data

[8] *Id.*, Appendix A at 7.

[9] *Id.*

[10] WG Report at 13.

inconsistencies. The MRD would be updated annually for deliverability and NQC updates.

Energy Division proposes several public sources and default assumptions to populate the MRD. The public sources include the master generator capability list, the NQC list, the local sub-area list, CAISO's grid interconnection queue, and other public information. The proposed default fields are:

(1) All batteries will be assumed to be 4-hour, one cycle per day.

(2) Maximum daily energy will be 4 x August NQC.

(3) Storage efficiency will be set at a conservative value of 0.8.

(4) First and last hour available are assumed to be 1 and 24 for most resources.

(5) For hybrids, generic sub-IDs will be listed to facilitate showings of all components.

MRP and PG&E support instructing Energy Division to implement details of the compliance and verification tools, with assistance from parties, to ensure consistency with adopted policy changes, similar to the current processes in the RA program.[11] MRP states that Energy Division should adjust tools for minor issues identified, so long as the changes do not affect the fundamental design principles of the SOD framework.

CEJA/CEERT recommend that the MRD include greenhouse gas (GHG) heat rate, whether resources are in a local capacity requirement (LCR) area, and whether resources are in a Disadvantaged Community (DAC).[12] CEJA/CEERT posit that this information increases transparency about lower GHG heat rate facilities, resources in constrained local areas, and minimizing emissions in

[11] MRP Opening Comments at 5, PG&E Opening Comments at 2.

[12] CEJA/CEERT Reply Comments at 4.

DACs. IEP opposes these proposals, arguing that there is little benefit to using the RA program to achieve GHG or pollutant reductions, that Integrated Resource Plan (IRP) decisions ensure that GHGs and emissions will decrease, that GHGs are already measured and regulated in other programs, and that capacity-based RA has no impact on how thermal resources are run.[13] IEP adds that Senate Bill 1020 ensures that the share of gas generation in LSEs' energy portfolios will continue to decline through 2045.

SCE proposes that that each resource should have a shape defined in the Resource Effective Load Carrying Capability (ELCC) Shape Database.[14] SCE states that even though many resources will have flat shapes initially, configuring the RA tools with shapes for every resource allows flexibility to adopt hourly Unforced Capacity Evaluation and ELCC for each resource if needed. SCE configures the ELCC shape database with two options: shapes relative to Pmax and shapes relative to the current single-monthly QC/NQC.

4.1.1. Discussion

The Commission determines that Energy Division's proposed process to develop the MRD, including the proposed default fields and use of public sources, is reasonable and appropriate for use in the SOD framework. This process is similar to the process used by Energy Division and CAISO to adjust and finalize the NQC templates.[15] The Commission agrees with SCE that each resource in the MRD should have a defined shape. Accordingly, Energy Division is authorized to publish the draft MRD to the Commission's website, with service to the service list in this proceeding, and request that

[13] IEP Reply Comments at 4.

[14] WG Report at 15.

[15] *See* D.06-07-031 at Conclusion of Law (COL) 8.

generators respond with corrections to the MRD. Energy Division is authorized to solicit informal feedback from parties, compare feedback from generators with information in CAISO's Master File, and incorporate corrections and feedback into the MRD, as warranted. The MRD will be updated annually for deliverability and NQC updates. Similar to the current practice for the NQC list, monthly updates will be made to account for new resources that have come online and for changes in capacity values.

In order to be eligible for RA compliance, resources must be represented on the MRD because the MRD will be used to validate SOD showings. We note that accurate representation of this data is critical to the implementation of the 24-hour framework and all generators must assist Energy Division to ensure that resources are accurately reflected on the final MRD.

The Commission deems it unnecessary for the MRD to include GHG heat rate and DAC resource information. Incorporating and updating heat rate and DAC information into the MRD for all RA resources would require substantial effort by Commission Staff and would greatly expand the MRD. We note that heat rate data is available from public sources, such as the CEC's Quarterly Fuel and Energy Reports, and that DAC status is available in the California Environmental Protection Agency's CalEnviroScreen tool. LSEs are encouraged to use this information when procuring resources under the SOD framework. However, we determine that including data in the MRD on whether resources are located in an LCR is reasonable and not overly burdensome. We direct Energy Division to include in the MRD whether resources are located in an LCR area.

Lastly, the Commission agrees with parties that it is reasonable for Energy Division to adjust and implement the MRD, and other compliance tools

further discussed below. As such, Energy Division is authorized to modify and implement the compliance and verification tools adopted for use in the SOD framework, and to modify and implement instructions and additional filing procedures, as necessary to ensure consistency with the Commission's direction and to ensure the orderly implementation of the slice-of-day framework and the changing needs of the RA program.

4.2. LSE Showing Tool and Commission Verification Tool

In D.22-06-050, the Commission described the LSE Showing Tool as a "spreadsheet used by each LSE to submit their monthly, 24-hour showing to the Commission."[16] The Commission described the LSE Showing Tool as follows:

- Contains a standard format for listing the resources in an LSE's portfolio including the resource ID found in the Master Database, their MW quantity associated with the must-offer requirement, and the capacity used in each of the 24 hours of the showing.
- The tool should include pass/fail logic identical to the Commission Verification Tool, so LSEs know in advance if they will pass Commission verification.
- This showing may also be used to provide CAISO the information it will need to determine the must-offer requirements of all resources, and the correct RA capacity values to use when performing their single-hour deficiency test.

The Commission also described the Commission Verification Tool that would be used to verify that an LSE satisfied its RA requirements:[17]

- The tool is designed to use the data submitted through the LSE Showing Tool.

[16] D.22-06-050, Appendix A at 8.

[17] *Id.*, Appendix A at 5, 8.

- The Commission uses the data submitted by the LSE in its showing, in conjunction with the RA [MRD], which will include solar and wind profiles to determine if an LSE passes the 24-hour RA requirement in each month.
- The tool contains basic logic to ensure the showing is consistent with the capabilities of the resources submitted, that sufficient capacity has been brought to meet the LSE's requirement in all 24 hours, and that sufficient excess capacity has been shown to meet the capacity requirements for storage.
- LSEs must pass all 24 hours, all logic tests, and the excess capacity requirement to pass the showing.
- The tool notes any hour(s) of failure along with the maximum capacity shortfall within the 24 hours.

SCE proposes an LSE Showing Tool that includes the above components as directed in D.22-06-050.[18] The tool lists resources in an LSE's portfolio, including resource ID, MW quantity associated with the must-offer obligation (MOO) requirement, and capacity used in each of the 24 hours. The Showing Tool uses a pass/fail logic identical to the Commission Verification Tool so LSEs know in advance if they will pass verification. The tool also includes internal tests to assist in the Commission verification process. The tool may be used to provide CAISO with information to determine the MOO requirements of all resources and correct RA capacity values when performing the single-hour deficiency test.

Clean Power Alliance (CPA) proposes another LSE Showing Tool, similar to SCE's tool, that alters two primary functions.[19] First, CPA incorporates a temporal charging and Pmin component to ensure an LSE's excess energy needed to charge any storage matches the actual charging parameters. Second,

[18] WG Report at 15.

[19] *Id*. at 17.

CPA proposes a change to impact single-cycle storage that aims to reduce the burden on LSE's need to manually manipulate hourly capacity values to determine compliance. This is achieved by determining an LSE's energy sufficiency to charge all of an LSE's shown single-cycle energy resources in the aggregate across all hourly short positions.

4.2.1. Discussion

The Commission determines that SCE's LSE Showing Tool is an appropriate tool for LSEs to use to submit their monthly, 24-hour showings to the Commission, and the tool satisfies the direction outlined in D.22-06-050. We find, however, that CPA's proposal to determine an LSE's energy sufficiency to charge all shown energy resources in the aggregate is a useful approach that would simplify the showing process for LSE's storage resources. As CPA's proposed logic has not been fully developed, we find it reasonable to adopt SCE's LSE Showing Tool approach with the modification that CPA's energy sufficiency charge mechanism should be incorporated into SCE's tool. Accordingly, SCE's LSE Showing Tool approach is adopted. We authorize Energy Division to implement CPA's energy storage sufficiency logic into SCE's LSE Showing Tool approach, to the extent possible. Energy Division is directed to publish a draft LSE Showing Tool on the Commission's website and solicit informal party comments.

4.3. LSE Requirement Database

In D.22-06-050, the Commission stated that the LSE Requirement Database was to be coordinated with the CEC and that the database "will utilize outputs generated by the CEC's load forecast proposal, including a dry run filing that

may inform any necessary changes."[20] The Commission determined that a dry run load forecast in 2022 for 2023 was necessary and requested that Energy Division conduct a dry run load forecast filing, in coordination with the CEC, to identify challenges and determine if refinements are needed.[21]

The Commission described the LSE Requirement Database as:[22]

- This will populate the LSE allocation tab used in the LSE compliance showing.
- Contains the official requirements of each LSE (hourly load + PRM), by month, for all 24 hours.
- Is used by each LSE to determine its monthly 24-hour showing requirement.
- Is used by the Commission to ensure each LSE meets its monthly 24-hour showing requirement.
- Is developed by the Commission in communication with the CEC after the CEC finalizes the monthly, 24-hour load shape for each LSE.
- Database is non-public. Each LSE has access to only its requirements; the Commission has access to all data.

The CEC undertook a dry run forecast process in August 2022 and directed LSEs to provide a load forecast for 24 hours per month for the day of their non-coincident peak.[23] Following the dry run, CEC proposes an approach for adapting the current load forecasting process, which allocates a share of the total load forecast to each LSE, to the 24-hour SOD framework using submitted forecasts.[24] The first step is to develop a reference forecast for each transmission

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[20] D.22-06-050 at OP 27.

[21] *Id*. at 78.

[22] *Id*., Appendix A at 7.

[23] WG Report at 18.

[24] *Id*.

access charge (TAC) area by removing historical load shapes for non-Commission jurisdictional entities and removing automatic transmission load adjustment, because transmission losses may only apply to peak hours. The CEC then proposes to apply an hour- and LSE-specific coincidence adjustment to LSE forecasts comparable to the current approach but focused on system peak hours. LSE forecasts may also be adjusted based on a comparison of LSE forecasts to a benchmark based on recorded loads, load migration activity, LSE forecast submittals, and weather-adjusted loads. The final step in the forecast determination process is to adjust all forecasts so that the sum is within 1% of the reference forecast.

The Commission finds that the CEC's outlined process for adapting the current load forecasting process to the 24-hour slice framework is reasonable. Modifications to the process may be addressed in a future phase of this proceeding. To the extent that the forecast process for the test year requires further refinement, the CEC should raise those issues with the Commission as soon as practicable.

4.4. Cost Allocation Mechanism and RA Allocation

In D.22-06-050, the Commission directed parties to consider the CAM process and RA allocation as applied to the SOD framework and address availability and capability of CAM-eligible resources and LSEs' load share during those slices.[25]

Energy Division proposes to use monthly peak load ratio for CAM, Reliability Must Run (RMR), and DR allocations for all 24 slices, to be consistent

[25] D.22-06-050 at OP 27.

with how CAM costs are recovered from customers.[26] The CAM portfolio can be allocated to LSEs by slice, or by resource or aggregate resource level. If allocated by slice, CAM allocations could vary hourly, which would require hard coding MW values for each hour. Energy Division notes that while this is administratively simpler and would match credits to debits evenly in all slices, it would also result in LSEs not being able to show their share of the resource differently across hours.

Energy Division recommends that CAM allocations be provided at a resource or aggregated resource level, so LSEs have flexibility to use the allocations to fill individual hourly needs. Energy Division notes that further evaluation is needed on how much complexity this would add to the validation and compliance tools, as well as potential credit and debit mismatch to facilitate CAM allocation by resource.

Energy Division notes that under the current CAM mechanism, investor-owned utilities (IOUs) would receive an energy sufficiency requirement associated with the entire CAM storage resource, rather than their portion of the CAM storage resource.[27] Energy Division proposes equitable allocation of energy sufficiency requirements associated with CAM storage resources to electric service providers (ESPs) and community choice aggregators (CCAs). CalCCA is not opposed to CCAs and ESPs showing excess generation to charge CAM storage resources so long as storage CAM amounts are known to the LSE well in advance of their RA showing.[28]

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[26] WG Report at 22.

[27] *Id*.

[28] CalCCA Opening Comments at 12.

AReM and CalCCA argue in favor of providing CAM allocations at a resource level so LSEs have flexibility to show how CAM resources will meet hourly requirements.[29] CalCCA concedes that this would be administratively complex but would ensure that the aggregate of LSEs would not show more than the full capacity of the resource by continuing to allocate to all LSEs their pro rata shares of CAM resources. PG&E states that allocation by resource should not be problematic as LSEs would be allocated a percentage of the resource, which can be accommodated in the LSE Showing Tool.[30] Cal Advocates supports allocating CAM credits as fixed amounts for each hourly slice in the interim and once operational information is known, considering a permanent approach using a fixed slice value or resource allocation.[31]

4.4.1. Discussion

The Commission finds it reasonable to use the monthly peak load ratio for CAM, RMR and DR allocations for all 24 slices, as proposed by Energy Division, as this is largely consistent with how CAM costs are recovered from customers. We also agree with Energy Division that energy sufficiency requirements associated with storage CAM resources should be equitably allocated to ESPs and CCAs. Therefore, Energy Division should include energy sufficiency requirement allocations to LSEs using the CAM debit/credit mechanism.

Several parties advocate for providing CAM allocations at a resource level. While we agree that allocating CAM at a resource level will give LSEs more flexibility to show CAM resources to meet hourly requirements, it would be administratively simpler to allocate CAM resources by resource class, such as

[29] AReM Opening Comments at 3, CalCCA Opening Comments at 11.

[30] PG&E Opening Comments at 3.

[31] Cal Advocates Opening Comments at 2.

renewable resources, thermal resources, and storage resources. This approach should give LSEs the same flexibility as allocation at the resource level but should also simplify allocations and LSE showings.

Accordingly, the monthly peak load ratio will be used for CAM, RMR, and DR allocations for all 24 slices. Energy Division is directed to include energy sufficiency requirement allocations to LSEs using the CAM debit/credit mechanism. CAM resources will be allocated by resource class. Energy Division is directed to determine the resource classes necessary to account for variation in the resources' daily profiles and use limitations.

5. Workstream 2. PRM and Resource Counting Rules

5.1. Solar and Wind Resource Counting

In D.22-06-050, the Commission determined that PG&E's exceedance methodology "provides a sufficient means to determine solar and wind profiles that are benchmarked to stressed system conditions."[32] The Commission acknowledged "that the exceedance levels recommended by PG&E are based on a limited set of data (average monthly peak day production for each historical year) and require further development to ensure that the appropriate exceedance levels are benchmarked against a more robust dataset."[33] The Commission directed parties to continue development of PG&E's exceedance methodology in workshops. Parties submitted several proposals, which are summarized below.

5.1.1. Summary of Exceedance-Based Proposals

PG&E proposes an exceedance-based seasonal approach with a 70% exceedance level applied in all hours of the summer months, and a

[32] D.22-06-050 at 80.

[33] *Id*.

50% exceedance level applied in all hours of the non-summer months.[34] PG&E recommends using five years of recorded CAISO data and applying the methodology at the technology and geography level (*i.e.* fixed tilt and tracking for solar, NP15 and SP15, and out-of-state and offshore categories for wind).

To arrive at its proposal (referred to as the "Top 5 Days" proposal), PG&E applies a six-step methodology: (1) identify the top five highest load days in each month during each year of the data set; (2) review solar and wind performance during those days for all hours, and convert to capacity factors using net dependable or "interconnection" capacity at the time; (3) average data across all years to arrive at a high-load day profile; (4) set up exceedance profiles using the data set; (5) compare high-load day performance to the exceedance production at a given level, with a focus on loss of load hours from IRP's LOLE studies; and (6) select the exceedance level that results in minor differences between that level and the high-load day profile in loss of load hours. PG&E favors testing its proposal, and potentially other proposals, in the PRM-setting tool to evaluate the impact on the PRM.

MRP supports PG&E's methodology to find the exceedance threshold but disagrees on the number of days of each month to calculate the benchmark.[35] MRP proposes use of the days in which the peak falls within the top 5% of hours, rather than the top 5 load days. MRP states that this proposal (referred to as the "Top 5%" proposal) incorporates additional days in the benchmark as load varies over time, providing a more robust data set. MRP indicates that this

[34] WG Report at 26.

[35] *Id*. at 54.

benchmark supports an 80% exceedance for solar from May-October, and a 60% exceedance in all other months.

Building on PG&E's proposal, Cal Advocates recommends setting four quarterly, or 12 seasonal, exceedance values, benchmarked against the average Top 5 highest load days.[36] For wind, the exceedance values would use the six wind regions used to calculate ELCC values in this proceeding. Cal Advocates states that calculating by region ensures that lower-performing regions do not penalize the RA value of all resources. Cal Advocates notes that this proposal can be extended to setting solar values.[37]

Cal Advocates' proposal applies PG&E's first three steps to identify a benchmark load profile consisting of the month-hour average of the wind performance on the Top 5 Days. To calculate exceedance values, Cal Advocates uses PG&E's data set and minimizes the sum of absolute value of the within-quarter difference between the benchmark load profile and historic capacity factor for a given exceedance value. The methodology continues the minimization to iterate exceedance values until a value with the least variation is identified. The exceedance levels of the 4-season proposal are as follows:[38]

Month	Quarterly Exceedance Value	Corresponding Monthly Capacity Factor
1	32%	9%
2		17%
3		25%
4	57%	21%
5		27%
6		30%
7	62%	29%

[36] *Id*. at 43.

[37] *Id*. at 50.

[38] *Id*. at 47.

8		26%
9		14%
10	38%	14%
11		7%
12		10

For the 12-season alternative, Cal Advocates contends that the same steps are applied but exceedance values are set by aggregating differences across months, rather than by quarter.[39] Cal Advocates believes this approach would reduce the total difference between the average Top 5 Worst Day performance and capacity factors identified by an exceedance value. Cal Advocates states that in all months, the average capacity factor for the 12-season approach is 18.8%, as compared to 19% for the four-season approach, indicating that the 12-season approach is marginally more conservative in capacity counting. For a region where wind resources have not been installed, Cal Advocates states that exceedance values will need to be calculated using modeled data for a minimum three years and maximum five years to populate the data set, with historical data added to the data set as it becomes available.

Cal Advocates comments that the monthly granularity of 12-seasons provides the most accurate reflection of a high-load day profile of any of the exceedance profiles.[40] Cal Advocates adds that its proposal would not require periodic revisions to the exceedance level because the proposal automatically calculates the appropriate resource value as new performance data becomes available. Cal Advocates posits that performance-driven methodologies will allow the resource counting approach to be more responsive to the impacts of climate change, as extreme weather events occur in the data set.

[39] *Id*. at 48.

[40] Cal Advocates Opening Comments at 5.

ACP-CA proposes that exceedance profiles for wind be calibrated based on ELCC values to address concerns about arbitrary exceedance thresholds for wind and concerns that exceedance results differ greatly from ELCC.[41] ACP-CA recommends the following steps: (1) develop a monthly profile for each wind region using a large sample of production data; (2) convert each region's wind performance to capacity factors using installed capacity, develop 12 monthly 24-hour profiles per region, and average data to arrive at a 24-hour monthly profile; (3) test monthly exceedance values on a monthly basis and develop average production per month from historical or synthetic data for a monthly capacity factor; (4) test the monthly profile against monthly ELCC values by applying exceedance analysis; and (5) update the analysis as new production data becomes available and updates to ELCC are available.

SEIA recommends a 50% exceedance solar output in the evening hours, stating that this threshold reasonably replicated the monthly 2023 ELCC values.[42] SEIA bases its proposal on its analysis of the exceedance value of solar against the 2023 ELCC values for the CAISO solar fleet and evaluation of solar output in hours with significant non-zero loss of load probabilities.

5.1.2. Summary of Other Proposals

NRDC puts forth two non-exceedance-based proposals, referred to as Worst Day profiles and LOLE Study Informed profiles.[43] The Worst Day methodology applies the following steps: (1) utilize the SERVM data set; (2) subset days across all years to the highest 2.5% of "worst days" for each month; and (3) take the mean output by month-hour for all days to produce a

[41] WG Report at 39.

[42] *Id*. at 38.

[43] *Id*. at 29.

synthesized profile. This proposal samples the highest load days across multiple years and excludes PG&E's exceedance matching step, which NRDC argues causes error in all hours for which the exceedance methodology is not well-matched for peak day results.

The LOLE-Informed methodology leverages LOLE modeling to develop the underlying portfolio.[44] The following steps are applied: (1) utilize the SERVM data set; (2) subset days across all runs that experience LOLE events; for months without observed LOLE, subset the top 1% of days by net load or by the narrowest supply margin; and (3) for all days, take the mean output by month-hour to produce a synthesized profile. NRDC states that both approaches use LOLE modeling to develop synthetic load and resource profiles, as historical observations are limited data sets for all resources and do not exist for many new resources.

CalWEA recommends basing wind and solar profiles on average historical production during the top 5 highest-load days in each month, stating that this captures the correlation between production and stressed conditions.[45] CalWEA adds that this is similar to ELCC but focuses on specific hours each month, and avoids selecting exceedance levels to enumerate the benchmark.[46]

5.1.3. Comments on Proposals

AES and SEIA support PG&E's proposal.[47] After evaluating PG&E's exceedance values based on solar output in the five peak load days each month, SEIA states that the approach is reasonable as the values result in output

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[44] *Id*. at 31.

[45] *Id*. at 37.

[46] CalWEA Opening Comments at 2.

[47] WG Report at 38, AES Opening Comments at 2.

generally below the peak load day data. To capture additional days with grid stress that may not be in the Top 5 Days data set, IEP recommends adding to PG&E's Top 5 Days any days on which CAISO called a Flex Alert.[48] PG&E finds IEP's revision to be reasonable and easily implementable.[49]

CalWEA and CESA oppose PG&E's proposal.[50] CalWEA expresses concern that the proposal divides the year into a subjective two seasons and that using two exceedance values to represent 12 months will result in under-and over-representing actual production. CESA disfavors PG&E's approach because it only seeks to minimize positive differences, yielding more conservative values from the same data, and notes that the SOD framework allows for a 12-season approach that would reduce estimation error.

CAISO notes that there were many "stressed days" (defined as days when CAISO issued a Flex Alert or emergency declaration) where 70% exceedance profiles did not cover actual production of solar and/or wind, and even 90% exceedance did not cover production for all evening hours.[51] CAISO observes that PG&E's methodology does not cover all stressed days of the August 2020 and September 2022 heat waves that lasted longer than five days. CAISO states that higher exceedance levels better ensure coverage of renewable production on stressed days and better account for the drop in solar in evening hours.

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48 IEP Opening Comments at 8.

49 PG&E Reply Comments at 2.

50 CalWEA Opening Comments at 3, CESA Opening Comments at 6.

51 WG Report at 51, CAISO Opening Comments at 8.

CalWEA, CESA, CLECA, IEP, and SEIA support either Cal Advocates' 12-season or 4-season proposal.[52] If an exceedance methodology is adopted, CalWEA asserts that Cal Advocates' proposal produces QC values that more closely approximate historical production values, as compared to PG&E's proposal. CESA notes that Cal Advocates' proposal attempts to quantify the difference between the exceedance value and the observed value and minimizes differences for the season. CESA argues that the 12-season approach fully leverages the flexibility of the SOD framework to recognize the fluctuation of variable energy resource (VER) output. CLECA supports the 12-season approach but recommends 4-seasons for the test year.

Cal Advocates, CAISO, DMM, and PG&E support MRP's proposal.[53] CAISO compared MRP's and PG&E's proposals and did not find significant differences between the two. CAISO states that both proposals generally support an 80% exceedance for solar and 75% exceedance for wind in summer months. CAISO prefers MRP's proposal as it better ensures that all benchmark hours are covered by the exceedance level, not just hours with potential loss of load. DMM favors MRP's proposal because it uses a conservative exceedance value that accounts for all hours and produces nearly no over-counting against the benchmark. DMM remarks that this helps protect reliability during stressed conditions and against insufficient charging as the system increasingly relies on non-generation resources.

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[52] CalWEA Opening Comments at 2, CESA Opening Comments at 6, CLECA Opening Comments at 5, IEP Opening Comments at 4, SEIA Opening Comments at 5.

[53] Cal Advocates Opening Comments at 5, CAISO Opening Comments at 5, DMM Opening Comments at 2, PG&E Opening Comments at 4.

CalWEA and SEIA object to MRP's proposal.[54] SEIA disagrees with sampling many days that have no reliability concerns and weighing them equally to high-demand days, which may dilute the correlation between solar output and high loads. SEIA asserts that selecting exceedance values from the Top 5% data set is too conservative, as MRP chooses profiles that do not exceed the Top 5% in more than a single hour.[55] SEIA adds that the aim of selecting an exceedance value is to replicate calibration data as much as possible, not to choose an output consistently lower than the calibration data. CalWEA states that MRP's focus on only high-load days results in low sample sizes that generate inaccurate exceedance levels. Calpine is concerned that MRP's proposal casts too wide a net by including significantly more days.[56]

Numerous parties object to ACP-CA's proposal to calibrate exceedance levels using monthly ELCC values to benchmark hourly profiles, including Cal Advocates, CalWEA, CLECA, IEP, MRP, and PCE.[57] These parties generally state that the SOD QC should not be calibrated to ELCC values, which measure a resource's ability to serve incremental demand for a continuous period and are not intended to reflect hourly values. By contrast, the SOD framework is intended to ensure adequate resource generation in all hours. Other parties contend that ELCC values are shaped by assumptions in LOLE studies and not based on actual performance.

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54 CalWEA Opening Comments at 6, SEIA Opening Comments at 6.

55 SEIA Reply Comments at 2.

56 Calpine Opening Comments at 2.

57 Cal Advocates Opening Comments at 7, CalWEA Opening Comments at 6, CLECA Opening Comments at 6, IEP Opening Comments at 6, MRP Reply Comments at 3, PCE Opening Comments at 4.

CalWEA and IEP oppose SEIA's proposal because they argue that it misapplies ELCC to justify a 50% exceedance level for the SOD framework.[58] These parties similarly argue that ELCC values were not intended to reflect hourly values and the proposal seems to equate ELCC values as equivalent to net peak capacity factors.

Numerous parties recommend using historical production data to the extent available, including AES, Cal Advocates, CalWEA, MRP, PG&E, and SEIA.[59] The parties generally state that historical production data is readily accessible and transparent, whereas synthetic modeling data may not be regularly updated (due to Commission staff constraints) and are difficult to verify. MRP, Cal Advocates, and PG&E add that modeled data should be used if historical data is not available, such as for offshore wind resources.

As for the number of years of data, MRP endorses a rolling five-year data set, updated each time Energy Division updates the LOLE study.[60] PG&E supports five or more years with updates every two years.[61] SEIA favors adding 2021 and 2022 to PG&E's data set, IEP supports adding a year or two to the data set, and AES supports using six years of data.[62]

MRP and PCE disagree with using the PRM tool to ensure the profiles are correctly calibrated.[63] MRP argues that the PRM tool is intended to develop a

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58 CalWEA Opening Comments at 7, IEP Opening Comments at 5.

59 AES Opening Comments at 2, Cal Advocates Opening Comments at 8, CalWEA Opening Comments at 8, MRP Opening Comments at 11, PG&E Opening Comments at 4, SEIA Opening Comments at 4.

60 MRP Opening Comments at 13.

61 PG&E Opening Comments at 5.

62 IEP Opening Comments at 9, AES Opening Comments at 2, SEIA Opening Comments at 6.

63 MRP Opening Comments at 13, PCE Opening Comments at 5.

profile that fits a given PRM but does not independently consider what the resource's contribution would be. PCE states that counting methodologies are largely irrelevant to reliability and the impact of a higher resource value will be accounted for in the PRM. PCE states that if an exceedance value exceeds typical generation in an hour, the PRM will automatically compensate to ensure that LSEs collectively contract with an adequate overall portfolio.

PG&E asserts that curtailments should not be adjusted at this time given the difficulties with accounting for them.[64] PG&E suggests evaluating this issue in the future to ensure it does not have a significant impact on resource value. MRP comments that it would be reasonable to add curtailed generation back in for system curtailments, but for local curtailments, there should be more understanding of how susceptible the resource is to congestion.[65] MRP recommends Energy Division work with CAISO to obtain aggregate curtailment data by resource technology.

5.1.4. Discussion

In D.22-06-050, the Commission determined that PG&E's proposed exceedance methodology provided "a sufficient means to determine solar and wind profiles that are benchmarked to stressed system conditions" but that "the exceedance levels recommended by PG&E are based on a limited set of data (average monthly peak day production for each historical year) and require further development to ensure that the appropriate exceedance levels are benchmarked against a more robust dataset."[66] We further stated that "[r]elying on actual production data, rather than synthetically-produced data, or

[64] PG&E Opening Comments at 5.

[65] MRP Opening Comments at 14.

[66] D.22-06-050 at 80.

methodologies tied to the results of modeling outputs, will result in a more implementable framework that can be refreshed annually."[67]

Therefore, the Commission already determined that an exceedance-based methodology shall be used to determine solar and wind resource profiles for the SOD framework. We also concluded that the use of historical production data will lead to a more implementable framework, as compared to modeled data. As such, we decline to consider non-exceedance-based proposals that require synthetically-produced data, such as NRDC's proposals, for the SOD framework.

The Commission does not agree with proposals to calibrate exceedance levels using monthly ELCC values to benchmark hourly profiles, as ACP-CA and SEIA recommend. As parties point out, these proposals misapply ELCC values that measure a resource's ability to serve demand over a continuous period (*i.e.*, a year or month) to the 24-hour SOD values, which are intended to ensure grid reliability in all hours.

The Commission finds that PG&E's Top 5 days exceedance-based methodology provides a reasonable means to determine solar and wind profiles benchmarked to stressed system conditions. We also agree with IEP's modification that, in addition to PG&E's Top 5 Days, any day on which CAISO called a Flex Alert should be added to the data set. We are persuaded, however, that Cal Advocates' proposal to use 12 seasons would result in a more accurate approximation of a high-load day profile using historical production values, compared to PG&E's two-season approach. Cal Advocates' proposal better utilizes the granularity of the 24-hour SOD framework and accounts for variations in solar and wind performance, while minimizing the differences

[67] *Id.*

between the exceedance value and the observed value. While MRP's Top 5% proposal has merit, the Commission agrees that it uses a potentially large sampling of days in which there may be no reliability issues, which could result in an overly conservative estimate of solar and wind output. In addition, the Top 5% proposal requires more administrative complexity than a Top 5 Day approach.

As such, the Commission concludes that Cal Advocates' 12-season approach is the appropriate exceedance methodology to determine profiles for solar and wind resources for the 24-hour SOD framework. PG&E's Top 5 days data set will be modified to add any days on which CAISO called a Flex Alert. The exceedance methodology will be applied to historical data to generate technology (solar fixed/tracking/solar thermal) and regional profiles.

The Commission concludes that six years of historical production data, with updates every year, is reasonable as the basis for the exceedance methodology. For example, for 2024, exceedance values will use historical production data from 2017 – 2022. Where historical production data is not available, exceedance values will be calculated using modeled data for a minimum three years to populate the data set. The modeled data will be sourced from IRP modeling. As resources in new areas generate historical production data, new data will be added to the data set and displace earlier years. Energy Division is directed to develop the solar and wind resource profiles, which will be incorporated into the MRD.

Lastly, the Commission does not have a data source to address curtailment issues at this time. To the extent that curtailment issues arise in the future and verified data is available, the Commission may consider including such curtailment in the data set.

5.2. Hybrid and Co-Located Resource Counting

In D.22-06-050, the Commission stated that for hybrid and co-located resources, the existing additive QC methodology should be used as a starting point for the 24-hour framework and updated "to use an exceedance approach (rather than monthly ELCC) in valuing the solar and wind portion of the resource and to account for charging losses."[68] The Commission stated that "further discussion is needed to address different hybrid configurations, ITC charging assumptions, and partial deliverability counting under the 24-hour framework" and "PG&E's proposal should be further refined to capture the necessary data to reflect hybrid and co-located configurations across the 24-hour slices through the development of the RA Resource Master Database."[69]

PG&E proposes that the hybrid methodology should update the storage capacity to account for charging losses and count all renewable capacity available to charge the storage resource, even if some renewables are not deliverable.[70] Remaining capacity from a generating resource after the storage component's charging requirement is met would be counted using the new renewable counting methodology. Resources without charging restrictions would be counted using the methodology applied to relevant standalone generating resource types, as is done today.

CESA recommends that paired resources should be characterized as charging exclusively on-site or allowing grid charging.[71] If a resource allows grid charging, the contribution of the resource's components to meeting SOD needs

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[68] D.22-06-050 at 88.

[69] *Id*. at 88.

[70] WG Report at 80.

[71] *Id*.

should be assigned individually. If a resource can charge fully on-site, the contribution of the resource's components should be based on sufficiency internally, as only on-site generation would charge the storge asset. Under either scenario, the deliverability of the VER component should not pose a limitation to comply with the internal sufficiency check. For both categories, charging sufficiency verification should not prescribe when the storage is charging, only that there is sufficient energy across the showing to support storage utilization. CESA asserts that paired resources should be shown within their operational parameters but as separate assets in the showing.

CESA proposes a system-wide test for energy-only (EO) resources to determine if charging sufficiency verification for storage is needed.[72] CESA recommends estimating the energy output of standalone EO VERs using the exceedance methodology applicable to their RA-providing counterparts. If the sum of hourly output is enough to cover charging needs of all standalone storage shown for RA, no further LSE charging sufficiency test would be needed. If the hourly output is insufficient, a sufficiency test per LSE would be conducted. This would be a system-wide test, so LSEs would not have to reveal EO positions.

CAISO advises that only Full Capacity Deliverability Status, Partial Capacity Deliverability Status, or Interim Deliverability Status resources can provide RA capacity under the CAISO tariff.[73] Under the tariff, CAISO will reduce the Local Regulatory Authority (LRA)-established QC values for any part that proves to be undeliverable. CAISO asserts that EO resources cannot be used

[72] *Id*. at 87.

[73] *Id*. at 82.

for RA to serve load or to charge storage across the transmission system and that should not change under the SOD framework.

For co-located resources at the same point of interconnection, CAISO states that EO resources have no transmission impact and allowing the co-located EO resource to count towards storage charging would give equal treatment to hybrid resources with a single resource ID.[74] CAISO notes that the EO resource would not be part of the RA fleet and not subject to CAISO RA rules, such as the MOO and outage substitution. This co-located EO resource would be a new type of configuration only used by the CPUC LRA.

SEIA proposes that for direct current (DC)-coupled hybrids, LSEs should be able to show the "clipped" solar energy as part of the excess energy used to charge storage.[75] DC-coupled systems can capture additional DC solar output that would otherwise be lost, or clipped, in the inverter. Data that would be needed to calculate and verify the additional available energy include: (1) the project's Inverter Loading Ratio (DC output divided by alternating current (AC) output), (2) an engineering estimate of internal losses, (3) maximum charging capacity of the paired storage, and (4) a showing of the average hourly clipped energy available to be stored in each month.

SCE proposed that for hybrid resources, the MRD and compliance tools includes a validation check to ensure that the total showing amount is not larger than can be supported by the underlying energy resource.[76] To facilitate this, the hybrid showings would require additional accounting of expected energy

[74] *Id*. at 83.

[75] *Id*. at 81.

[76] *Id*. at 83.

resource production, expected storage charging pattern, loss accounting, and the final slice-by-slice result.

5.2.1. Comments on Proposals

AES, Cal Advocates, CalCCA, CAISO, CESA, NRDC, PG&E, and SEIA support allowing EO resources to count towards the storage charging sufficiency requirement if the EO resource is charging on-site storage.[77] These parties generally argue that this should be permitted because on-site generation does not require solar output to be delivered to a different location and does not rely on the transmission system to deliver charging capacity to the co-located storage resource.

CAISO, Cal Advocates, and PG&E state that for a non-deliverable renewable to be counted for charging sufficiency, the storage should be capped by the charging capacity of the renewable.[78] PG&E adds that this should only apply if there are charging restrictions, as batteries do not have limitations associated with charging from the grid in those configurations. AES comments that for resources with or without charging restrictions, it may be necessary to cap hourly additive value due to interconnection limits.[79]

CAISO and MRP note that non-deliverable co-located resources would not be subject to CAISO's RA rules.[80] CalCCA and CESA respond that while not subject to a MOO, on-site renewables have an incentive to produce and charge

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[77] AES Opening Comments at 4, Cal Advocates Opening Comments at 11, CalCCA Opening Comments at 13, CAISO Opening Comments at 8, CESA Opening Comments at 7, NRDC Reply Comments at 4, PG&E Opening Comments at 5, SEIA Opening Comments at 7.

[78] Cal Advocates Opening Comments at 11, CAISO Opening Comments at 9, PG&E Opening Comments at 5.

[79] AES Opening Comments at 4.

[80] CAISO Opening Comments at 8, MRP Opening Comments at 4.

the on-site storage.[81] In addition, if the renewable is on outage and unavailable to charge the storage, CalCCA states that substitution rules should apply to the storage, which would be designated as RA capacity, so that substitute capacity is available to cover the renewable. CESA adds that while EO VERs are not subject to substitution rules, RA-providing VERs are not either and allowing EO standalone VERs to meet charging sufficiency verification provides little risk.

MRP states that full deliverability status should be required for a hybrid resource with or without charging restrictions to ensure that it can reliably deliver energy per RA obligations.[82] IEP objects to allowing EO facilities to count for charging sufficiency but urges that facilities that have received Off-Peak Deliverability Status should be considered reliable sources in off-peak hours.[83]

CalCCA and CAISO oppose CESA's proposal to allow EO resources to charge resources that are not on-site.[84] CAISO states that there is no guarantee that EO VER resources can deliver generation to charge storage facilities. CalCCA states that charging storage with off-site generation requires the transmission system and thus assurance that the generation can be delivered to the storage facility is necessary.

5.2.2. Discussion

As determined in D.22-06-050, the QC methodology for hybrid and co-located resources shall be the existing additive QC methodology, which shall be updated to use the exceedance methodology adopted in this decision to value wind and solar and account for charging losses.

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81 CalCCA Reply Comments at 6, CESA Reply Comments at 2.

82 MRP Opening Comments at 15.

83 IEP Reply Comments at 4.

84 CalCCA Opening Comments at 14, CAISO Opening Comments at 1.

Numerous parties support allowing EO resources to count towards the storage charging sufficiency requirement if the EO resource is charging on-site storage. The Commission agrees with parties that this is reasonable because on-site generation does not rely on the transmission system to deliver charging capacity to the co-located storage resource. We also deem it reasonable that in these instances, the charging capacity of the renewable resource should be capped at the amount that can be used to charge the on-site storage and the storage should be capped at the interconnection limit. It is appropriate that hybrid components should be shown as separate assets on the MRD and LSE showings, as long as the total MW of each component does not exceed the interconnection amount in any hour.

Regarding SEIA's proposal, the Commission does not have the ability to capture the data required from DC-coupled systems (*i.e.*, project's inverter loading ratio, engineering estimate of internal losses). Therefore, this proposal is not implementable at this time.

Accordingly, hybrid resources will be characterized on the MRD as either charging exclusively on-site or allowing grid charging. An EO resource may count towards the storage charging sufficiency requirement if the EO resource charges exclusively on-site storage. Storage will be capped by the charging capacity of the renewable resource if it cannot charge from the grid and will be capped at the interconnection limit. On the MRD and LSE showings, hybrid components will be shown as separate assets, and the total of the components will not exceed the interconnection amount for any hour.

5.3. Unforced Capacity Evaluation (UCAP) / UCAP-Light Methodology

In D.22-06-050, we concluded that while we saw merit in a UCAP framework, "[c]onsidering the breadth of outstanding issues to develop prior to initial implementation of the 24-hour framework, the Commission agrees with parties that consideration of the UCAP framework should be deferred to a later phase of the proceeding."[85] The Commission also considered a "UCAP-light" ambient derate alternative and determined that developing such a mechanism would require input from CAISO and other stakeholders. We stated that despite potential implementation challenges, we saw merit in a UCAP-light mechanism and encouraged parties to develop a mechanism in workshops.

According to the WG Report, a UCAP-light methodology was not sufficiently developed to be included in the WG Report.[86] IEP advises that it was not possible to develop a UCAP-light counting method using CAISO's outage data and identifies numerous problems with the data, including plants reporting data in an inconsistent hourly format and data reporting on individual spreadsheets that would require aggregation to a usable format.[87] Given the data limitations, IEP asserts that it is not possible to use the data to calculate UCAP or UCAP-light adjustment factors for all thermal plants and recommends deferring until CAISO can provide data in a more usable format.

CAISO, CalCCA, Fervo, MRP, NRDC, and PG&E recommend foregoing development of a UCAP-light methodology and exploring a comprehensive application of UCAP to account for other types of forced outages, not just

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85 D.22-06-050 at 99.

86 WG Report at 24.

87 IEP Opening Comments at 9.

ambient derates.[88] CAISO advises that its outage data may be incomplete because resources submit larger overlapping outages that account for ambient derate, and the data is not a good source for a UCAP that accounts for only ambient derates. CalCCA and PG&E contend that UCAP-light cannot realize the benefits of a full UCAP methodology.

AReM, Cal Advocates, and GPI support continuing to develop a UCAP-light mechanism, and AReM supports development with the potential for setting fixed derates by geographic location and the use of a consultant or CAISO to calculate the values.[89] CESA, Hydrostor, and MRP state that there is insufficient record for adoption of a UCAP-light or UCAP methodology.[90] MRP observes that CAISO has not moved forward with a UCAP proposal in its stakeholder initiative.

As affirmed in the WG Report, a UCAP-light proposal was not sufficiently developed during the Working Group process. As such, there is no proposal for the Commission to consider.

In D.22-06-050, the Commission stated that:[91]

> As discussed in D.21-07-014, the Commission continues to see merit in the UCAP framework and observes that embedding forced outage rates into a resource's RA value would better reflect the resource's contribution to reliability across the 24-hour framework.

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88 CAISO Opening Comments at 9, CalCCA Opening Comments at 15, Fervo Opening Comments at 4, MRP Opening Comments at 18, NRDC Reply Comments at 5, PG&E Opening Comments at 7.

89 AReM Opening Comments at 4, Cal Advocates Opening Comments at 14, GPI Reply Comments at 3.

90 CESA Opening Comments at 12, Hydrostor Opening Comments at 2, MRP Opening Comments at 18.

91 D.22-06-050 at 98.

We concur with parties that at this stage, it is appropriate to forego development of a UCAP-light mechanism and explore a comprehensive application of UCAP to account for other types of forced outages, not just ambient derates. We recognize the concerns and limitations with CAISO's current outage data that have hindered development of an implementable proposal. We encourage CAISO to work through these data limitations to further develop a full UCAP mechanism for consideration in this proceeding.

In D.22-06-050, the Commission stated that if a UCAP-light mechanism could not be developed, dispatchable resources shall continue to count at their Pmax value, as they do today, until a mechanism is developed.[92] Accordingly, as there is no UCAP-light mechanism to consider, dispatchable resources will continue to count at their Pmax value.

5.4. Energy Storage Resource Counting

In D.22-06-050, the Commission determined that Pmax or UCAP-light (if developed) restricted to daily resource capability shall apply to energy storage resources under the 24-hour framework.[93] Excess capacity must be shown to cover battery capacity with efficiency losses.

Regarding storage resources with multiple cycles per day, the Commission stated that "[i]f the storage resource is capable and contracted to provide multiple cycles, it should be allowed to count in this manner, provided that the LSE shows sufficient capacity to charge the storage and account for losses between each cycle. We observe, however, that more discussion is needed on this issue to consider any unintended consequences."[94]

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92 *See id*. at 84.

93 *Id*. at 86.

94 *Id*.

Regarding long-duration energy storage (LDES) and multi-day reliability events, the Commission noted that "ensuring LDES resources are properly valued across the slice-of-day framework is critical to the durability and success of the 24-hour framework."[95] The Commission acknowledged that LDES and multi-day reliability event issues may not be fully addressed before initial implementation of the 24-hour framework but directed parties to begin discussions in workshops and develop proposals to the extent possible.[96]

5.4.1. Multi-Cycle Storage

For storage resources that are contracted to provide multiple cycles per day, SCE and CESA recommend that these resources be allowed to be shown for multiple cycles per day, given that they may be dispatched in excess of one cycle by CAISO.[97] CESA argues that if there are warranty conditions that limit the resource to a fixed number of cycles per day, that does not govern what is offered to CAISO and thus, RA storage assets should be able to be shown for more than one cycle each day.

Cal Advocates, CalCCA, and PG&E endorse SCE and CESA's proposal so long as the LSE shows sufficient excess energy and time between discharge cycles to charge the battery.[98] Cal Advocates suggests that an LSE should attest that the resource can respond to CAISO dispatch for multiple cycles per day. PG&E and CalCCA comment that under CAISO's rules, storage resources have a must-offer obligation after a single charge cycle, allowing CAISO to discharge

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95 *Id*. at 87.

96 *Id*.

97 *Id*. at 86.

98 CalCCA Reply Comments at 5, Cal Advocates Opening Comments at 13, PG&E Opening Comments at 6.

storage again after a full cycle. PG&E states that excess capacity can be accounted for in SCE's LSE Showing Tool and the Commission should monitor when storage is regularly dispatched twice to ensure bidding behavior does not lead to adverse market conditions. PG&E posits that if these rules are adopted, there should be no need to review the contract language.

MRP states that if a warranty only covers a single cycle per day, there is an issue of whether a warranty should limit physical availability or dispatch and whether the CAISO market models allow a storage owner to reflect the additional costs from cycles beyond a single cycle per day.[99]

The Commission concurs with parties that if the contractual agreement permits more than one cycle per day, it is reasonable that storage resources should be able to be shown for multiple cycles per day so long as the LSE shows sufficient excess energy and time between discharge cycles to charge the battery. We are convinced that because existing CAISO rules require a must-offer obligation after a single charge cycle, this allows the CAISO market to discharge storage again following a full cycle. As long as CAISO's rules remain in place, it is unnecessary to verify the terms of the underlying contractual agreement.

Accordingly, storage resources that are operationally and contractually able to provide multiple cycles in a 24-hour cycle may be shown for multiple cycles per day provided that the LSE shows sufficient excess energy and time between discharge cycles to charge the battery. The MRD will indicate if a storage resource can perform multiple cycles per day and the LSE Showing Tool will account for needed charging capacity.

[99] MRP Opening Comments at 16.

5.4.2. Multi-Day Storage

CESA asserts that the SOD framework presents challenges for LDES assets with operational timeframes of more than 24 hours because assets with durations over, for example, 10 hours may not complete a full charge/discharge cycle in 24 hours.[100] CESA puts forth a "seasonal charging scheme" for storage assets with operational timeframes of more than 24 hours that would allow LSEs to take excess hourly capacity from one showing period to another. CESA argues that this allows carryover of excess energy to be used in future seasons for storage charging and captures the dynamic of moving spring-month overgeneration to provide charging sufficiency for storage assets shown in summer or winter months. As this is only available to LSEs with storage assets with an operational timeframe of over 24 hours, it would also incentivize LSEs to procure these assets.

AES supports CESA's proposal and Form Energy supports it with the caveat that the MCC buckets should not be used for multi-day reliability needs since the MCC buckets were not designed for multi-day reliability.[101] Form Energy also claims that multi-day storage (MDS) resources should be allowed to show under daily and seasonal charging by treating a single MDS system as separate storage systems that add to the total duration but cannot show in the same hours.

Cal Advocates, GPI, IEP, MRP, and PG&E state that a multi-day storage counting methodology is not ready for adoption and additional discussion is

[100] WG Report at 85.

[101] AES Opening Comments at 5, Form Energy Opening Comments at 2.

needed.[102] Cal Advocates and IEP assert that it is premature to adopt this mechanism for resources that do not yet exist. PG&E voices concern that there was insufficient workshop discussion on the mechanics of shifting energy and capacity between months. MRP, Cal Advocates, and IEP prefer additional workshops to develop a QC methodology for LDES after the SOD framework is implemented. Calpine and MRP state that the SOD framework is not well-suited to recognize the value of resources that cycle in excess of a single day.[103]

As discussed, in D.22-06-050, the Commission recognized that ensuring LDES resources are properly valued across the SOD framework is critical to the durability and success of the SOD framework.[104] We also recognized that the issues around the valuation of LDES may not be fully addressed prior to initial implementation of the SOD framework. Further discussion on this topic was initiated in workshops. We agree with parties, however, that a multi-day storage counting methodology is not ready for adoption. Additional discussion on this issue should be undertaken after the initial implementation of the SOD framework. Parties are encouraged to consider monthly use limitations and various LDES technologies when developing a future counting methodology. We note that in the IRP proceeding, LSEs are required to procure 1,000 MW of storage with a minimum duration of eight hours by 2026, thereby incentivizing LSEs to procure storage resources with a minimum eight-hour duration.[105]

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[102] Cal Advocates Opening Comments at 13, GPI Reply Comments at 5, IEP Reply Comments at 3, MRP Opening Comments at 17, PG&E Opening Comments at 7.

[103] Calpine Opening Comments at 3, MRP Opening Comments at 16.

[104] D.22-06-050 at 87.

[105] D.21-06-035 at 35.

In D.22-06-050, we determined that Pmax or UCAP-light (if developed) restricted to daily resource capability shall apply to energy storage resources under the 24-hour framework.[106] Accordingly, as no UCAP-light proposal was developed, Pmax will continue to be used as the basis for the QC determination for energy storage resources.

5.5. Hydroelectric Resource Counting

In D.22-06-050, the Commission determined that the existing QC methodology for hydroelectric (hydro) resources shall be applied to hydro resources under the 24-hour framework, with monthly values applied to all hours.[107] The Commission stated that in future years, it may be appropriate to expand the counting rules to monthly load shapes at a resource level or a resource grouping level.

CAISO expresses concern that scheduling coordinators for hydro RA resources limit hydro availability below its QC value on a daily basis by shaping energy bids across the day or by submitting daily energy limits to CAISO that limit the total energy a resource can be scheduled for in the day-ahead market.[108] CAISO thus recommends that the Commission consider hourly shaped QC values for hydro resources because static QC values may overestimate the total monthly energy available from these resources.

MRP comments that CAISO does not offer a proposal as to how hourly energy limits and corresponding hourly capacity values would be determined.[109] MRP recommends retaining the existing QC methodology for hydro but agrees

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106 *See* D.22-06-050 at 86.

107 *Id*. at 89.

108 WG Report at 113.

109 MRP Opening Comments at 19.

that hydro capacity values must be informed by daily energy limits in a SOD framework and should be discussed further.

The Commission agrees that CAISO's concern is an issue that should be considered after the implementation of the SOD framework.

5.6. Demand Response Resource Counting

In D.22-08-039, the Commission "recognizes the need for a DR counting methodology for use in the 2024 test year and finds it reasonable to apply the [Load Impact Protocol (LIP)] methodology to the 2024 test year. However, LSEs need further guidance on how to utilize the LIP outputs under the 24-hour slice framework."[110] The Commission directed parties to develop proposals for the test year in workshops and specifically address:[111]

1. The hours in which DR resources can be shown and whether those hours must be consecutive.
2. Whether the transmission and planning reserve margin adders should be applied.
3. Whether or not the value of DR resources can vary by hour.
4. Whether, and if so, how snap back effects should be accounted for.

5.6.1. Test Year Methodology

Energy Division outlines four options for DR counting for the 2024 test year.[112] Option 1 recommends that DR is variable across all hours, identical to the LIP outputs, which would be most flexible for LSEs and demand response providers (DRPs). Option 1 would not enforce 4-hour availability,

[110] D.22-08-039 at 11.

[111] *Id*. at OP 2

[112] WG Report at 97.

which Energy Division highlights would raise reliability concerns, but would account for snap back effects. Under Option 2, DR would be variable but capped at the average four worst consecutive availability assessment hours (AAH), which would have some enforcement for 4-hour availability and account for snap back effects. Energy Division identifies downsides for Options 1 and 2, in that they are complicated to implement and validate, and likely to significantly overstate available capacity in a 24-hour period.

Under Option 3, DR would be variable in any four hours from LIPs (consecutive or non-consecutive), which would enforce four-hour non-consecutive availability. Option 3, however, would not account for snap back, may not align with master file program design and contract capabilities, and many resources cannot dispatch multiple times per day. Under Option 4, DR would receive a single, constant value equal to the minimum of any four consecutive hours within the AAHs. Option 4 enforces four-hour consecutive availability and is simplest to implement but would not account for snap back. Energy Division proposes that under Options 2-4, DR resources could potentially be shown for more than four hours if longer dispatches were required by contract or tariff (*e.g.*, resources enrolled in the Base Interruptible Program).

SCE proposes that DR resources with impactful spillover effects should have a profile shape with a pre-determined call window that is determined by program rules in the tariff schedule/contract.[113] The window would include four consecutive hours across the AAHs of 4-9 p.m. SCE recommends that a four-hour DR resource with spillover would be shown from either 4-8 p.m. or

[113] *Id*. at 98.

5-9 p.m., depending on the month. For DR without impactful spillover, the LSE would choose which hours to show, accounting for RA minimum requirements and program rules and tariff schedules. SCE proposes that the capacity value of DR can vary by hour since DR is a variable resource.

SDG&E and PG&E recommend that DR comply with the minimum RA requirements, including the AAHs and four consecutive hour availability.[114] SDG&E and PG&E assert that for DR programs that dispatch for a longer period over a day, the hours should reflect program rules but could be non-consecutive. SDG&E and PG&E propose that DR should be allowed to vary by hour because it is not a fixed resource, and that precooling and snap back effects should be accounted for.

Demand Side Analytics (DSA) and CLECA advocate for hourly impacts that vary by month and include spillover effects, with the following additional modifications for the test year:[115]

(1) Align weather conditions with the worst day of the month planning conditions as defined by the Working Group.

(2) DR must be able to deliver a minimum of four consecutive hours in the AAH window.

(3) Once a DR provider elects the hours to show as part of the QC process, it cannot modify the dispatch hours.

(4) DR SOD load impacts need to factor in: weather scenario for load forecasting, resource shape, maximum event duration, spillover effects, and resource decay based on event duration.

(5) Require the production of SOD summary table by month and hour.

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[114] *Id*. at 100.

[115] *Id*. at 109.

CLECA, OhmConnect, and SCE support Energy Division's Option 1 for the test year.[116] These parties support variable showings of DR across hours, while observing minimum RA requirements, reliability concerns, and program rules per the tariff schedule or contract. OhmConnect states that the DRP should be responsible for determining the operational window for its resource. CLECA states that the proposal is consistent with CLECA/DSA's proposal.

CLECA, OhmConnect, and SCE oppose Energy Division's Option 2, Option 3, and Option 4 proposals.[117] These parties generally state that Option 2 would understate DR's capability during hours in which it can provide more load reduction than the worst hours. OhmConnect and CLECA contend that Option 3 unnecessarily caps duration at four hours and contradicts the existing four-hour continuous operation requirement. SCE states that Option 3 would make stacking the same resource within the same hour challenging. These parties generally argue that Option 4 does not consider the time-variant nature of DR and would understate DR's available capacity.

PG&E comments that the call window should be pre-determined in the LIP filing, should represent resource capability on the worst day of the month under the 1-in-2 peaking conditions, and that the load impacts should vary by hour.[118] SCE, CLECA, and OhmConnect also support a defined call window.[119] PG&E states that IOU DR should be allocated among LSEs as is done today,

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116 CLECA Opening Comments at 9, OhmConnect Reply Comments at 2, SCE Opening Comments at 1.

117 *Id*.

118 PG&E Opening Comments at 2.

119 SCE Opening Comments at 1, CLECA Opening Comments at 8, OhmConnect Reply Comments at 2.

except the RA showing would not only focus on the AAHs but instead, each hour of the worst day of the month.

CLECA states that if the PRM adder is eliminated, the LIPs should use 1-in-10 weather conditions instead of 1-in-2 weather conditions to avoid underestimating the contributions of DR resources to reliability, which could lead to higher reliance on less-preferred resources.[120]

OhmConnect states that spillover effects should be modeled if present but not introduced in the QC valuation because spillover effects are minor and overly complex to include.[121] OhmConnect adds that requiring negative crediting would incentivize DRPs to minimize spillover when precooling should be encouraged. CEDMC asserts that there are many questions on how to account for spillover and the issue should be deferred until there is certainty on how DR will be treated under the SOD framework.[122]

CEDMC agrees with SCE and PG&E that the value of DR should vary by hour, but objects to SCE's and CLECA's proposals that DR be required to be capable of dispatching during the AAHs and asserts that the RA market should dictate during what hours DR capacity is procured.[123] CEDMC also objects to DR being subject to a minimum four consecutive hour dispatch, stating that an LSE should be able to procure DR to meet a need during a single hourly slice and show for as many hours as DR is capable of operating, up to 24 hours.

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120 CLECA Opening Comments at 11.

121 OhmConnect Reply Comments at 3.

122 CEDMC Opening Comments at 6.

123 *Id*. at 2.

5.6.1.1. Discussion

Numerous parties advocate for allowing variable profiles for DR resources to reflect the capability of DR resources. We concur that the value of a DR resource should vary by hour and that the profiles should reflect the DR resource's capability on the worst day of the month under the 1-in-2 planning framework. Most parties further support requiring DR resources to be shown for at least four consecutive hours during the AAH window. The Commission agrees that requiring DR resources to be shown for at least four consecutive hours during the AAH window is important to ensure DR resources are counted during the hours that are most critical for system reliability. We find it reasonable to limit the hours in which DR resources can be shown to a specific four-hour call window within the AAHs during the test year, specifically 5-9 p.m., as these are the hours of greatest reliability risk within the AAHs according to Energy Division's 2022 LOLE analysis.[124] Restricting the call window would also mitigate the complexity introduced by allowing DR resources to utilize 24-hour profiles and align the call window for DR year-round, since the AAHs in March and April are 5-10 p.m. If the DR resource is required by contract or tariff to be capable of dispatching for more than four hours, however, the shown hours must include all of 5-9 p.m.

Some parties support that an LSE should not be able to modify the dispatch hours after the *ex ante* LIP filing is approved. CLECA points out that allowing LSEs to modify the dispatch hours would fundamentally alter the 24-hour slice-of-day stack, and that preventing further modification would

[124] *See* Energy Division LOLE Study, February 18, 2022, issued via ALJ ruling on February 18, 2022, at 12.

ensure that the sum of the parts equals the whole.[125] We agree with this rationale. As such, the hours when DR is shown by LSEs shall be the same as the hours that were used in the *ex ante* LIP filing.

With respect to snap back effects, we agree with parties that DR resources should show snap back effects in their *ex ante* LIP filings; however, given that snap back effects are relatively small and administratively complex to include, they should not be included in the DR QC valuation during the 2024 test year.

Accordingly, for the 2024 test year, DR resources shall be shown for four consecutive hours of 5-9 p.m., unless required by contract or tariff to be capable of responding to longer dispatches, in which case the shown hours must include all of 5-9 p.m. In addition, the value of DR resources will vary by hour based on the resource's capability on the worst day of the month under the 1-in-2 planning framework. Snap back effects shall be included in the *ex ante* LIP filings but will not be reflected in RA capacity counting.

5.6.2. Demand Response Adders

All DR counting proposals support retaining the transmission loss factor (TLF) adder and distribution loss factor (DLF) adder for the test year, including proposals from CLECA, Energy Division, PG&E, SCE, and SDG&E.[126] SCE asserts that the TLF and DLF (T&D) adders should be retained to ensure load impacts from supply-side DR are assessed on the same level as the CEC's load forecasts. CLECA states that additional capacity must be available to overcome T&D losses incurred when moving power through the grid.

[125] CLECA Opening Comments at 8.

[126] WG Report at 98, 111.

For the PRM adder, proposals differ as to what part of the adder to remove or retain. PG&E recommends eliminating the entire PRM adder, stating that DR does not reduce the need for operating reserves in the real-time market, DR is a variable resource for which a planning reserve is needed to offset variability, and DR includes uncertainties due to forecasting error and forced outages.[127] CLECA favors retaining the entire PRM adder because reducing load reduces the need for an incremental PRM.[128] CLECA opposes eliminating the operating reserves from the PRM and states that if load is reduced, the need for operating reserves is similarly reduced. CEDMC supports retaining the full PRM adder and states that it is unclear how it can be argued that if DR is dispatched as a supply-side resource, the PRM adder should be less than the overall PRM.[129]

SDG&E supports removing the operating reserves, forced outage, and forecasting error components.[130] SCE recommends removing the ancillary services/operating reserves component in instances where CAISO procures most of the ancillary services in the day-ahead market.[131] SCE also recommends removing the forecast error component as the QC of DR does not necessarily contribute to reducing the load forecast error. SCE states that the forced outage adder should be retained if the LIPs are retained, as not applying the forced outage adder would discount the QC of DR for forced outages twice.

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127 *Id*. at 101.

128 *Id*. at 111.

129 CEDMC Opening Comments at 5.

130 WG Report at 101.

131 *Id*. at 98.

5.6.2.1. Discussion

All proposals support retaining the TLF and DLF adders for the DR QC values for the 2024 test year. The Commission agrees that for the test year, the DLF and TLF adders should be retained to apply to DR. We note, however, that while the DLF adder is currently applied as an adjustment to QC values, the TLF adder is applied as a credit. This crediting effort requires significant administrative overhead and complexity to account for a very small amount of incremental capacity value attributable to the TLF adder, often fractional MWs at the LSE level. To minimize the administrative burden to account for fractional MWs, the Commission deems it reasonable to set the value of the TLF adder at 0% for the test year. Accordingly, for the 2024 test year for the SOD framework, the TLF and DLF adders will be retained to apply to the QC of DR resources, but the value of the TLF adder for the test year will be 0%.

Parties and Energy Division put forth a wide range of proposals on the PRM adder, with no consensus as to an approach for the test year. The Commission concludes that at this time there is insufficient record to address the PRM adder. This issue will be considered in Phase 3 of the Implementation Track, alongside the CEC's DR Working Group Report recommendations.

5.7. Planning Reserve Margin Calibration

In D.22-06-050, the Commission adopted a minimum 17 percent PRM for 2024 and stated that this PRM may be further revised in a June 2023 decision after a review of Energy Division's updates to the LOLE modeling by stakeholders and the Commission.[132] Regarding the interaction with the updated LOLE study and the SOD framework, the Commission stated:[133]

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[132] D.22-06-050 at OP 8.

[133] *Id*. at 92.

> The Commission recognizes that calibration of the 17 percent PRM to the 24-hour framework cannot feasibly be done, as the 17 percent does not match the current LOLE modeling output. As such, converting the results of the LOLE study to the counting rules applicable to the 24-hour framework should await the refreshed LOLE outputs from the IRP proceeding. Once refreshed LOLE outputs are available, conversion of the outputs to the 24-hour framework counting rules need to be completed, and NRDC's "proof of concept" template should be leveraged for the conversion.

The Commission further concluded that "[f]or initial implementation, one PRM will apply to all hours of the year."[134] In the Amended Scoping Memo, we stated that while the Implementation Track will consider modifications to the PRM for 2024 and beyond, the Reform Track will consider how to convert and calibrate the results of a LOLE study to the SOD framework.[135]

NRDC puts forth a tool to convert the 2022 LOLE study portfolio into monthly PRM values aligned with monthly portfolios identified in the LOLE study.[136] NRDC asserts that its tool can be calibrated to use several resource profile options and uses a 1-in-2 hourly load profile with a PRM multiplier that augments every hour's compliance requirement. The tool is not designed to incorporate resource-specific constraints, such as thermal run-time limits, and does not assess energy sufficiency for storage with charging limitations. The tool would need revisions to align with the adopted counting rules. NRDC recommends annual or semi-annual recalibration as part of the IRP proceeding, including multi-year forecasts based on anticipated resource development and retirements.

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134 *Id.*, Appendix A at 2.

135 Amended Scoping Memo at 4.

136 WG Report at 117, 122.

To determine each month's PRM, NRDC's tool uses the Excel Solver to determine the maximum PRM that can be sustained while meeting the following constraints: (1) instantaneous storage output must not exceed total storage power capacity; (2) cumulative daily storage output must not exceed total storage energy capacity; (3) the resource mix must be sufficient to meet the compliance requirement in all hours; and (4) the resource mix must be sufficient to provide sufficient excess capacity to charge all dispatched storage.

SCE presents a PRM calibration tool, similar to NRDC's tool, that is designed to incorporate specific limitations of resources.[137] The calibration is based on the following steps: (1) determine volume and mix of resources that achieve reliability and other targets; (2) convert nameplates and characteristics to SOD counting; (3) create a system level 24-hour slice stack consistent with Steps 1 and 2 that maximizes the PRM achieved for the highest load day while satisfying the SOD requirements; (4) the resulting PRM becomes the RA PRM. SCE proposes a two-year refresh aligned with the IRP cycle.

Building off of SCE's proposed tool, NRDC suggests a modification to its calibration process that would set monthly PRMs calibrated to the annual portfolio for any at-risk month, defined as months with modeled LOLE in the LOLE study.[138] Other months would have a generic PRM applied, as determined through SCE's annual PRM process.

EBCE proposes a PRM feasibility adjustment to assess whether the portfolio requirements are feasible given the State's available resources.[139] If infeasibility is identified, the PRM should be adjusted to reflect the reality of

[137] *Id*. at 123.

[138] *Id*. at 124.

[139] *Id*. at 126.

resources available to provide RA. The adjustment should consider that RA requirements should reasonably align with resources developed in IRP, that compliance should incent achievable outcomes, and should balance RA requirements with customer affordability.

5.7.1. Comments on Proposals

IEP, PG&E, and WPTF support SCE's calibration tool, as it provides more granularity than NRDC's tool.[140] Calpine finds both SCE's and NRDC's calibration tools to be reasonable.[141]

AReM, Calpine, IEP, MRP, and SCE recommend using a single annual PRM for the SOD framework.[142] AReM argues that monthly PRMs add complexity with uncertain benefits and MRP states that an annual PRM that maintains 0.1 LOLE can provide as much precision as a monthly PRM can. SCE reasons that there is no record on what reliability standards should be and significant work would be required to create monthly reliability metrics and a modeling process.

PG&E and AES support NRDC's modified proposal for monthly PRM values for summer months and a generic PRM for other months.[143] CAISO supports monthly PRM values, indicating that monthly PRMs capture reliability needs across the year more precisely.[144] SCE and NRDC oppose CAISO's

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[140] Calpine Opening Comments at 4, IEP Opening Comments at 13, PG&E Opening Comments at 8, WPTF Opening Comments at 10.

[141] Calpine Opening Comments at 4.

[142] AReM Opening Comments at 5, IEP Opening Comments at 13, MRP Opening Comments at 22, SCE Reply Comments at 2.

[143] AES Opening Comments at 6, PG&E Opening Comments at 9.

[144] CAISO Opening Comments at 3.

monthly-varying PRM proposal, as it would unduly delay SOD implementation.[145]

CAISO, Calpine, MRP, PG&E, and WPTF object to a reasonableness check to adjust RA requirements based on resource availability, stating that this issue should be deferred until after implementation or the test year.[146] These parties generally observe that it is unclear whether fewer resources will result from the SOD framework or from a properly calibrated PRM. WPTF points out that several thousand MWs of capacity are expected to come online in time for summer 2025. Calpine contends that RA requirements are based on assumptions about resource availability, particularly imports that may not reflect commercial reality. AReM and NRDC support allowing Energy Division to adjust RA requirements to reflect actual availability of resources.[147]

5.7.2. Discussion

Some parties support applying multiple PRMs to the SOD framework, depending on the month or season. There is insufficient record to adopt such proposals at this time. As determined in D.22-06-050, for initial implementation of the SOD framework, a single PRM shall apply to all hours of the year. As established in the Amended Scoping Memo, Phase 3 of the Implementation Track will consider modifications to the PRM for 2024 and beyond.[148] The Commission may also consider whether multiple PRMs are appropriate for the SOD framework in a future phase of this proceeding.

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[145] SCE Opening Comments at 2, NRDC Opening Comments at 2.

[146] CAISO Opening Comments at 1, Calpine Opening Comments at 5, MRP Opening Comments at 21, PG&E Opening Comments at 8, WPTF Opening Comments at 12.

[147] AReM Opening Comments at 6, NRDC Opening Comments at 5.

[148] *See* Amended Scoping Memo at 4.

The Commission finds that NRDC's calibration tool is appropriate to convert the results of the LOLE study to the SOD framework. The NRDC tool can be used to calibrate LOLE results to a SOD PRM while ensuring that the PRM meets instantaneous and cumulative storage output constraints and energy sufficiency in all hours. However, SCE's calibration tool offers more granularity and precision by incorporating specific limitations of individual resources. As SCE's calibration tool has not been fully developed, we find it reasonable to adopt NRDC's calibration tool with the modification that individual resource limitation features of SCE's calibration tool should be incorporated. Accordingly, NRDC's calibration tool is adopted. We authorize Energy Division to incorporate the individual resource limitations, provided by SCE's proposal, into NRDC's calibration tool. Once Energy Division has modified NRDC's calibration tool, to the extent possible, Energy Division is directed to publish the draft calibration tool on the Commission's website and solicit informal party comments.

The Commission declines to adopt EBCE's or NRDC's feasibility adjustment proposals. We agree with parties that this is unnecessary at this time and note that a proposed effective PRM, which would address similar concerns, is being considered in the Implementation Track.

5.8. Maximum Cumulative Capacity Buckets

In D.22-06-055, the Commission stated that "[f]ull removal of the MCC buckets would eliminate the monthly availability requirements specified in the bucket structure. The Commission is concerned that removal of the MCC bucket structure without careful consideration may result in unintended

consequences."[149] The Commission noted that, for example, this would mean that "DR resources would no longer be required to be available Monday-Saturday, for four consecutive hours between 4:00 and 9:00 p.m., and at least 24 hours per month from May-September."[150] For this reason, the Commission stated that before eliminating the MCC buckets, "it may be necessary to include some availability requirement for resources with monthly use limitations, particularly for demand response and import resources."[151]

Because DR resources are fundamentally use-limited, Energy Division maintains that the amount of DR that can be used to meet RA requirements should continue to be capped.[152] Energy Division states that the current MCC bucket threshold for DR is based on the difference between the peak load hour and the 25th highest load hour of the average summer month. Energy Division suggests adjusting the methodology by restricting counting to the AAHs to determine peak load hour and 25th highest load hour. This assumes that DR should be available at least 24 hours per month, should serve load during peak hours, is generally dispatched during high-priced hours, and should be available during the AAHs. Energy Division's methodology is as follows:

(1) Calculate hourly load profiles for last three years (gross or net);

(2) For each year: (a) rank the hours from highest to lowest load for every Hour Ending (HE) in each month, and (b) calculate the "average summer month" with hours ranked by HE;

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149 D.22-06-050 at 100.

150 *Id*.

151 *Id*. at 101.

152 WG Report at 139.

(3) Calculate the "average summer month" for the last three years with hours ranked by HE;

(4) Find the peak (1st highest load) within the AAHs for the average summer month (L_1);

(5) Find the 25th highest load within the AAHs for the average summer month (L_{25}); and

(6) RA procurement limit for DR = $L_1 - L_{25} / L_1$.

The proposed limits are below, with comparison to status quo limits:

Methodology	DR Procurement Limit	Increase from Status Quo
Gross load 2019-2021, avg. summer month (status quo)	8.5%	N/A
Gross load 2019-2021, avg. summer month, restricted to AAHs	9.9%	+1.4%
Net load 2019-2021, avg. summer month restricted to AAHs	14.4%	+5.9%

For imports, Energy Division proposes a requirement to deliver energy for at least four hours during the AAHs from at least Monday through Saturday through the compliance month, consistent with the contract. This could be self-scheduled or bid between $0 and negative $150 per MWh to align with the requirements adopted in D.20-06-028.

SCE recommends that for the 2024 test year, standalone energy storage should count in MCC bucket 4 if it passes the energy sufficiency test.[153] SCE reasons that many LSEs are expected to be long on standalone energy storage and therefore, counting storage in bucket 4 is necessary to avoid over-procurement under the existing MCC rules.

[153] *Id*. at 140.

CESA recommends a minimum requirement for the MCC buckets rather than a maximum, by setting a minimum requirement for assets with availability above four hours to minimize multi-day reliability risks.[154]

5.8.1. Comments on Proposals

Several parties support eliminating the MCC buckets except for the DR bucket, including AES, CEJA/CEERT, CLECA, and PG&E, while AReM and Form Energy support eliminating all MCC buckets.[155] PG&E states that the combination of the MOO, the four-hour availability requirement, and the hourly structure of the SOD framework obviates the need for buckets 1-4. PG&E states that the exception is for imports because the import RA rules adopted in D.22-06-028 provide that the import must be "consistent with the MCC buckets," so the language would need to be updated if the MCC buckets are eliminated. PG&E recommends the language from D.20-06-028 referring to the MCC buckets be replaced with "every Monday-Saturday." AReM states that the MCC buckets are burdensome and unnecessary for the SOD framework. Form Energy opposes the MCC buckets as not being designed to meet emerging, multi-day reliability needs.

CLECA and CEJA/CEERT recommend maintaining the DR bucket for initial implementation and reevaluating in the future.[156] PG&E recommends that DR should have an hourly cap based on gross load, and should be required to be available 30 hours each month based on the capacity bidding program (CBP).[157]

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[154] *Id*.

[155] AES Opening Comments at 7, AReM Opening Comments at 9, CEJA/CEERT Opening Comments at 7, CLECA Opening Comments at 12, Form Energy Opening Comments at 5, PG&E Reply Comments at 3.

[156] CLECA Opening Comments at 12, CEJA/CEERT Opening Comments at 7.

[157] PG&E Opening Comments at 11, PG&E Reply Comments at 4.

PG&E proposes that a DR procurement limit be applied to each slice to ensure reliability procurement, rather than a limit on total MWh across all slices, which could be problematic if an LSE used DR to meet a high portion of its RA requirement in one slice. CEDMC and OhmConnect oppose PG&E's 30-hour proposal, with OhmConnect stating that it would not align with CAISO's tariff and CEDMC arguing that the proposal is unfounded.[158]

Hydrostor, MRP, and SCE oppose eliminating the MCC buckets and assert that there is insufficient record developed to do so.[159] SCE states that there are several classes of RA resources that have non-daily use limits that are not directly accounted for in the SOD framework. MRP asserts that more discussion is needed on how the SOD framework will account for monthly and annual limitations.

AReM, CESA, and PG&E support SCE's proposal to count standalone storage in bucket 4 for 2024.[160] PG&E states that recent IRP procurement orders have resulted in contracts for significant additional storage capacity and thus, many LSEs will exceed the bucket 1 cap in 2024.[161] MRP opposes SCE's proposal and surmises that once the PRM is appropriately set, revised bucket limits will allow for greater storage in MCC bucket 1.[162] PG&E disagrees with MRP and states that the MCC buckets have no linkage to the PRM; rather, MCC buckets

158 CEDMC Reply Comments at 5, OhmConnect Reply Comments at 4.

159 Hydrostor Reply Comments at 2, MRP Opening Comments at 27, SCE Reply Comments at 1.

160 AReM Opening Comments at 9, CESA Opening Comments at 12, PG&E Opening Comments at 12.

161 PG&E Reply Comments at 3.

162 MRP Opening Comments at 28.

are based on load shape and are a tool to limit overreliance on resources that might not have sufficient charging capacity.[163]

AES and Form Energy support CESA's proposal to set a minimum requirement for assets with availability above four hours to maximize multi-day reliability.[164]

5.8.2. Discussion

Numerous parties support eliminating the MCC buckets, except for the DR bucket, for the SOD framework. It is critical to the Commission that use-limited resources are available throughout the compliance month and not over-relied upon in meeting the 24-hour SOD requirements. As such, we find it reasonable to retain the MCC DR bucket for the SOD framework, beginning with the test year. We also find it appropriate to use the status quo methodology in determining the value of the MCC DR bucket limit; that is, based on gross load and 24 hours per month. The DR bucket limit should be applied equally to each slice in the 24-hour framework to avoid over-reliance of DR resources in any one slice.

Multiple parties support eliminating the remaining MCC buckets 1-4 for the SOD framework. In D.22-06-050, the Commission expressed concern that removing the MCC buckets may result in unintended consequences, particularly for import resources and demand response resources.[165] For import resources, PG&E proposes that replacing the import RA rule language that states "consistent with the Maximum Cumulative Capacity buckets" with "every Monday through Saturday" would capture the MCC bucket's current limitation

[163] PG&E Reply Comments at 3.

[164] AES Opening Comments at 7, Form Energy Opening Comments at 4.

[165] D.22-06-050 at 101.

[166] This proposal is consistent with Energy Division's proposal. The Commission agrees that PG&E's proposal to modify the import RA rule adopted in D.20-06-028 would ensure consistency with the current import RA rules and maintain the limitation on RA imports established by the MCC buckets.

SCE objects to eliminating the MCC buckets 1-4 and identifies classes of RA resources with non-daily use limits that are not directly accounted for in the SOD framework, including imports, some use-limited gas peakers, hydroelectric, and DR resources.[167] We note that non-daily use limitations of peakers and hydroelectric resources are not covered by the MCC buckets either.

With the modification to the import language adopted in D.20-06-028 and the retention of the DR bucket, the Commission finds that the concerns with removing the MCC buckets have been addressed and it is reasonable to eliminate MCC buckets 1-4 for use with the SOD framework.

For the current RA program, the Commission is persuaded that many LSEs will exceed the MCC bucket 1 cap in 2024 and that a transition from the current RA program to the SOD framework is necessary. As such, we agree with SCE's proposal that for the 2024 RA compliance year, standalone storage should count in MCC bucket 4 provided that an LSE shows sufficient charging capacity.

Accordingly, the MCC buckets 1-4 are not applicable to the SOD framework beginning with the 2024 test year. The MCC DR bucket will be retained for the SOD framework and the status quo methodology for determining the MCC DR bucket limit will be used, based on gross load and 24 hours per month. The DR bucket limit will apply equally to each slice.

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[166] PG&E Opening Comments at 5.

[167] *See* SCE Reply Comments at 1.

In addition, a non-resource-specific import will count towards the RA requirements, provided that:

a. The contract is an energy contract with no economic curtailment provisions.
b. The energy must self-schedule (or in the alternative, bid in at a level between negative $150/MWh and $0/MWh) into the CAISO day-ahead and real-time markets at least during the AAHs every Monday - Saturday throughout the RA compliance month.
c. The energy must be delivered to the LSE in accordance with the governing contract.

These changes to the MCC framework are effective for the SOD framework beginning with the 2024 test year. As the current RA program will continue to utilize the MCC bucket structure for compliance purposes for the 2024 RA year, LSEs may show standalone energy storage in MCC bucket 4 for 2024, provided that the LSE shows sufficient charging capacity. To ensure that an LSE has sufficient charging capacity, if an LSE elects to show standalone energy storage in bucket 4 in its 2024 RA compliance filing, the LSE must:

(1) Show sufficient charging capacity on the SOD LSE Showing Tool for each applicable month. The SOD LSE Showing Tool is due by the applicable compliance filing deadline (*i.e.,* October 31 for the year-ahead filing, 45 days before the compliance month for month-ahead filings).

(2) Submit the LSE's compliance filings for the current RA program, due by the applicable compliance filing deadline.

We note that the above requirements are applicable to LSEs that show standalone energy storage in MCC bucket 4, even though the SOD test year showings are adopted for a subset of months and a later submittal schedule, as further discussed in Section 5.9.

5.9. Test Year Mechanics

In D.22-06-050, the Commission determined that a 2024 test year would be appropriate prior to full implementation of the SOD framework in 2025.[168] The Commission further stated that development of the design of the 2024 test year should be undertaken by parties in workshops.

SCE proposes that for the test year, and to maintain consistency with current CAISO RA processes, the MRD and 24-hourly resource shapes should be expressed in terms of a single-monthly NQC.[169] This would allow test year showings to be 24 hourly slices and provide LSEs a connection with the Commission and CAISO showings under the current RA program.

EBCE proposes a feasibility assessment during the test year to assess whether the PRM is feasible given the resources available to meet the RA requirements.[170] EBCE also proposes a resource feasibility assessment during the test year using aggregate LSE showings to evaluate the need for inter-LSE hourly transactability. While hourly transactability is not expected to be a feature at the implementation of the SOD framework, EBCE states that it could be a useful tool during the test year.

MRP recommends that the 2024 RA portfolio established using the current RA program rules and the appropriate PRM should be compared to the portfolio that would be shown under the SOD framework.[171] MRP also proposes test year exit criteria for measuring whether the SOD framework is implementable and what modifications are necessary following the test year. The exit criteria should

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168 D.22-06-050 at OP 15.

169 WG Report at 133.

170 *Id*. at 134

171 *Id*. at 169.

include: (1) whether the showing and compliance tools and processes function as intended, and (2) whether CAISO systems and templates are ready for the 2025 compliance year.

5.9.1. Comments on Proposals

PG&E asserts that the test year should focus on LSEs readying their procurement practices and portfolios for 2025.[172] WPTF states that the test year should identify administrative issues and that a working group should be convened to resolve any issues, if needed.[173] After the test year showing, MRP recommends that Energy Division prepare a report identifying any problems, that the Commission consult with parties to consider solutions, and that Energy Division and parties confer as to whether implementation should be delayed.[174]

Cal Advocates suggests that parties have an opportunity to evaluate the test year through working groups or comments and that this should occur after certain milestones beginning in 2023 (*e.g.*, submission of year-ahead load forecasts, submission of year-ahead showings).[175] ACP-CA advocates for additional test years if the 2024 test year reveals many LSEs that previously had sufficient RA supply plans are deficient under the new framework.[176] CEJA/CEERT recommend that the test year include an analysis of how the new

[172] PG&E Opening Comments at 9.

[173] WPTF Opening Comments at 2.

[174] MRP Opening Comments at 25.

[175] Cal Advocates Opening Comments at 16.

[176] ACP-CA Opening Comments at 4.

framework could impact contracting for gas resources, as compared to the current RA program.[177]

CalCCA supports EBCE's hourly transactability test.[178] AReM, Cal Advocates, MRP, PG&E, and WPTF object to an hourly transactability test during the test year or state there was insufficient record to adopt one.[179] PG&E and AReM note that the Commission already stated in D.22-06-050 that it wanted to see a clear need for hourly transactability after implementation before taking further action. WPTF argues that such an assessment during the test year would be tentative because LSEs are not required to show RA portfolios that meet their individual allocations during the test year. PG&E points out that because LSEs do not face penalties or backstop risk for insufficient test year showings, it should be expected that LSEs may be deficient in these showings.[180] Thus, PG&E contends that the Commission will lack sufficient information from the test year to base such an assessment.

CalCCA supports a resource feasibility test and recommends a system waiver process if the test fails.[181] WPTF and MRP oppose this assessment during the test year, with WPTF stating that LSEs are expected to bring on several thousand MWs of new system resources in 2024 and that the conditions observed by the feasibility test are not likely to persist beyond the test year.[182]

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177 CEJA/CEERT Opening Comments at 7.

178 CalCCA Opening Comments at 4.

179 AReM Opening Comments at 7, Cal Advocates Opening Comments at 17, MRP Opening Comments at 27, PG&E Opening Comments at 9, WPTF Opening Comments at 7.

180 PG&E Reply Comments at 7.

181 CalCCA Opening Comments at 4.

182 WPTF Opening Comments at 7, MRP Reply Comments at 9.

WPTF recommends that the test year consist of a year-ahead showing and only a sampling of month-ahead showings.[183] WPTF advocates for submitting the year-ahead SOD showing by November 30, so as not to unduly burden LSEs and Energy Division with the SOD showing being due alongside the current year-ahead RA showing on October 31. WPTF proposes that LSEs in the test year should be permitted to include resources different from those on their regular showing, so long as the additional resource is expected to come online during the compliance period and the LSE plans to utilize the resource for compliance with future hourly RA requirements. PG&E supports WPTF's proposals to simplify the test year so long as LSEs can count storage in MCC bucket 4 in all months.[184]

5.9.2. Discussion

The Commission's goals during the test year are: (1) for LSEs and Energy Division to test the new showing and compliance tools, as well as the new SOD rules to determine whether adjustments are needed, and (2) for LSEs to adjust their procurement practices and RA portfolios in preparation for the 2025 full implementation year. The Commission anticipates that minor adjustments to the compliance tools and program rules may be necessary following the test year.

The Commission agrees with WPTF that showings for the 2024 test year should be limited to a year-ahead compliance showing and a sample of month-ahead compliance showings, so as not to overburden LSEs (and Energy Division) while they simultaneously comply with the current RA requirements and

[183] WPTF Opening Comments at 2.

[184] PG&E Reply Comments at 6.

showings. We agree that the year-ahead showing for the test year should be submitted on November 30.

Accordingly, for the 2024 test year, LSEs shall submit a year-ahead compliance showing by November 30, 2023. Month-ahead compliance showings shall be limited to March, June, and September and shall be submitted by the first day of the showing month. The exception to this test year filing timeline is if an LSE chooses to show energy storage resources in MCC bucket 4 and thus is required to show sufficient charging capacity in any applicable month, as discussed in the previous section.

As determined in D.22-06-050, "we decline to consider hourly resource or load obligation trading for inclusion in the 24-hour framework at this time. However, if transactability and inefficiency concerns arise once the new 24-hour framework is implemented, the Commission may consider proposals to include hourly obligation trading."[185] The Commission maintains the rationale outlined in D.22-06-050 and thus, sees no reason to apply a test year assessment that considers the need for inter-LSE hourly transactability. As stated in D.22-06-050, should these concerns arise once the SOD framework is implemented – after the test year – the Commission may consider such proposals.

As discussed in Section 5.7, the Commission declines to adopt ECBE's feasibility assessment for the test year. As LSEs are not required to meet their hourly RA requirements and compliance penalties are not imposed for the test year, deficiencies during the test year are plausible.

The Commission declines to adopt exit criteria for the test year. The Commission, however, agrees that parties should have an opportunity to

[185] D.22-06-050 at 97.

provide feedback during the test year. Energy Division is authorized to solicit informal feedback from parties after key milestones, such as the year-ahead compliance showing. Energy Division is directed to prepare a report summarizing comments and feedback after the year-ahead test showings to be submitted to the Commission by February 1, 2024.

The Commission underscores that success of the test year is dependent on full, active participation by LSEs. LSEs have a penalty-free opportunity to prepare for and provide feedback on the SOD framework rules, compliance and showing tools, and processes. Subject to minor adjustments and modifications to the SOD framework rules and compliance and showing tools, the Commission fully intends to move forward with implementation of the SOD framework for the 2025 RA compliance year.

6. Workstream 3. CAISO and Commission Validation and Compliance

6.1. CAISO and Commission Administrative Changes

In D.22-06-050, the Commission stated that further development was needed to identify necessary changes to the CAISO tariff to ensure consistency across the Commission's and CAISO's processes.[186] We directed parties to identify and resolve administrative changes to both the CAISO's and the Commission's RA programs.[187]

In the WG Report, CAISO identifies five main RA processes that are impacted by QC and NQC values: (1) developing the NQC list, (2) system assessments, (3) local assessments, (4) must-offer obligations, and (5) outage

[186] *Id*. at 95.

[187] *Id*. at OP 27.

substitution obligations.[188] CAISO expresses concern that QC values based on the peak hour could be problematic for wind and solar if resource QCs are zero MW at the peak hour. CAISO states that this is because several CAISO processes use NQC values as a reference point and to calculate MWs of non-RA capacity of a resource, indicating whether a portion of a resource is eligible for the Capacity Procurement Mechanism (CPM) or substitute capacity. CAISO notes that if LSE showings are based on the peak hour, CAISO would not have insight into resources not shown at the peak hour and CAISO must have visibility into all resources used to meet the reliability of the Commission's portfolio to apply RA rules and dispatch resources in local capacity assessments.

To address these issues, CAISO recommends giving CAISO sufficient information to administer its processes, as well as to align CAISO and Commission compliance checks at the system coincident peak hour. CAISO proposes the following data points be transmitted from the Commission's processes:

(1) Non-zero QC values for each resource from the Commission to develop the NQC list.

(2) Maximum showing values from LSEs to ensure CAISO visibility into the Commission's RA fleet.

(3) Peak showing values from LSEs to use in CAISO system assessments.

CAISO further suggests that the Commission consider options other than peak hour values to establish the NQC list and for CAISO compliance. CAISO encourages parties to explore other compliance options in CAISO's stakeholder process. CAISO states that its proposal would require system changes and

[188] WG Report at 144.

discussion in CAISO's stakeholder processes to determine values for must-offer and outage substitution rules.[189]

SCE proposes that CAISO continue to use a single showing value from LSEs and suppliers, which would result in limited changes to CAISO's processes.[190] SCE proposes CAISO continue to use "System RA MW" value from SCE's LSE Showing Tool, which would represent the same single monthly QC value for resources as today. For example, SCE states that for solar resources, this value would be the current single-monthly solar ELCC percentage. SCE recommends retaining the current counting for solar and wind (*i.e.*, ELCC values) for CAISO's processes until CAISO changes its framework.

Silicon Valley Clean Energy (SVCE) posits that the value used to set NQCs for VERs has implications for the Maximum Import Capability (MIC).[191] SVCE states that the counting value for wind will impact the NQC value for resource-specific RA imports and therefore, the MIC amount that LSEs must hold to support imports. SVCE states that the SOD framework could require LSEs to secure more MIC to support VER-backed imports. SVCE proposes that peak load slice MWs, or a "25th value," could be the basis for wind and solar NQC values used to inform resource-specific imports.

PG&E supports SCE's approach of maintaining the status quo and waiting until CAISO's stakeholder initiative results in changes.[192] CESA supports SCE's proposal that CAISO continue to use a single showing value ("System RA MW")

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189 CAISO Opening Comments at 10.

190 WG Report at 145.

191 *Id*.

192 PG&E Opening Comments at 12.

to represent the same single monthly QC value and retain use of a storage asset's Pmax for establishing the single monthly QC value.[193]

CAISO comments that SCE's proposal would mean CAISO and the Commission use different counting methodologies, which may result in discrepancies for compliance, where an LSE could pass CAISO's compliance and not the Commission's compliance, or vice versa.[194] CalCCA states that CAISO and the Commission should aim to minimize the result that an LSE passes CAISO's compliance and not the Commission's.[195] CLECA notes that a solution to CAISO's concern, which was presented by CAISO, is that one value could be the peak hour showing values used for system RA assessments.[196] CLECA states that after determining the hourly capacity values for each month, the monthly QC for CAISO would be the hourly value at the time of the monthly peak. This would result in consistency for both programs, whereby for the Commission's framework, an LSE will have to meet 24 hourly load targets and for CAISO's program, the same value would be utilized for the peak hour.

AReM supports CAISO's proposal for validating an LSE's RA showings but states that refinement is needed for treatment of hydro and hybrid resources to ensure they are not devalued.[197] CAISO states that questions regarding MIC and system assessments should be considered in CAISO's stakeholder process.[198]

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193 CESA Opening Comments at 4.

194 CAISO Opening Comments at 10.

195 CalCCA Reply Comments at 6.

196 CLECA Reply Comments at 3 (citing CAISO Opening Comments at 10).

197 AReM Opening Comments at 9.

198 CAISO Reply Comments at 3.

6.1.1. Discussion

The Commission acknowledges the concern that CAISO requires sufficient information to administer its own processes. It is also important to align the Commission's and CAISO's compliance processes at the coincident peak hour to the extent possible. As such, it is reasonable that the Commission will provide CAISO with maximum showing values from LSEs and peak showing values from LSEs to ensure CAISO's visibility into the Commission's contracted fleet.

During the test year, the non-zero QC values will continue to be based on the current QC methodologies as those will be the compliance values for 2024. Beyond the test year, however, the existing counting methodologies cannot be used for the non-zero QC values for each resource, as ELCC values will no longer be updated under the SOD framework. As CAISO encourages the use of options for the non-zero QC values other than peak hour values, we find that applying an average of a resource's hourly values during the AAHs is an appropriate approach that balances CAISO's need for a non-zero QC value with the transition from the current RA program to the SOD framework. These non-zero QC values will be used by CAISO in the development of its NQC list until CAISO can make adjustments to account for the monthly profiles. These non-zero QC values will apply to all resources.

As CAISO has stated, CAISO will explore other compliance options in its stakeholder process and parties are encouraged to participate in those processes. Accordingly, Energy Division will provide CAISO with maximum showing values, peak showing values, and non-zero QC values for each resource to develop CAISO's NQC list and to ensure CAISO's visibility into the Commission's contracted fleet.

6.2. Flexible RA Requirements

In D.22-06-050, the Commission stated:[199]

> The Commission agrees that the granularity of the 24-hour framework may obviate the need for flexible RA requirements. However, CAISO's current tariff and processes will need to align with removal of these requirements. We find that further discussion is necessary to avoid misalignment or other unintended consequences.

The Commission directed discussion of the elimination of the flexible RA requirements in workshops.

Energy Division provided information on the pros and cons of removing the flexible RA requirements.[200] Energy Division asserts that removing the flexible requirements would enhance administrative flexibility within a complex SOD framework, that RA Availability Incentive Mechanism (RAAIM) penalties may not be sufficient to incent appropriate bidding behavior, and that flexible capacity prices have not reflected a system trying to incentivize new flexible capacity. Energy Division, however, points out that removing the requirements would remove the MOO and exposure to RAAIM penalties for the 17-hour, 7 day/week period and would necessitate significant realignment between the Commission's and CAISO's RA rules.

AReM, AES, GPI, MRP, and PG&E support eliminating the flexible requirements with the SOD framework.[201] MRP suggests the Commission and CAISO coordinate on new products that could replace the flexible RA requirements. PG&E states that CAISO should continue pursuing retirement of

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[199] D.22-06-050 at 102.

[200] WG Report at 149.

[201] AReM Opening Comments at 10, AES Opening Comments at 8, GPI Reply Comments at 5, MRP Opening Comments at 29, PG&E Opening Comments at 13.

flexible RA in its stakeholder process. CAISO states that it will continue coordinating with Energy Division on potential changes to the flexible capacity design.[202]

The Commission agrees with parties and Energy Division that eliminating the flexible RA requirements with the SOD framework has merit. However, the process to remove flexible RA requirements must be coordinated with CAISO's tariff and processes, which will require a CAISO stakeholder process to remove or modify. Removing one set of requirements at the Commission, and not removing the requirements at the CAISO, will result in significant confusion. The Commission will coordinate with CAISO on the future removal of the flexible RA requirements for the SOD framework.

7. Funding Allocation for SOD Implementation

In the Amended Scoping Memo, the Commission scoped consideration of "the allocation of funding to assist with the implementation of the 24-hour slice framework, including funds for a compliance filing portal and external facing user interface."[203]

To bring the new RA framework to full implementation, significant preparations before and during the 2024 test year are required, including development and refinement of the compliance and showing tools, analysis and evaluation of LSEs' compliance year-ahead and month-ahead showings, analysis and evaluation of the SOD rules and process, and development of a compliance filing portal and external facing user interface. This work will be ongoing after the test year through the initial years of implementation.

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[202] CAISO Opening Comments at 11.

[203] Amended Scoping Memo at 5.

The California Legislature's Annual Budget Act gives the Commission certain specific and limited ongoing reimbursable expenditure authority. Prior to exercising this authority, the Commission must issue a decision that identifies the contracting activities to be undertaken by the Commission, and the costs subject to reimbursement by utility companies. This decision serves that purpose.[204]

Commission staff anticipates technical support and consulting on the following types of tasks, including, but not limited to: (1) technical support for developing compliance reporting forms, (2) developing analytical tools for reviewing compliance submittal information, (3) assistance in developing tools for efficiently evaluating compliance submittal information, and (4) proposing programmatic process improvements to ensure efficiency and robustness of the program's ability to apply Commission rules.

For these purposes, beginning with the 2023-2024 fiscal year, we will authorize the expenditures of up to, but no more than $1 million annually for up to six years, for a total budget not to exceed $6 million. The maximum nominal value of a contract shall not exceed $6 million. The annual funds may be carried forward and expended in a subsequent year. If not spent within 6 years, the funds may be spent in subsequent years, but still may not exceed the maximum total.

The Commission's Executive Director will approve the expenditures and seek reimbursement from PG&E, SCE, and SDG&E. Reimbursement will be sought from these three IOUs on a proportional basis in relationship to their most recently available annual retail sales reported at the time of the start of the

[204] *See* Budget Act of 2010, Stats. 2010, Ch. 712, Item 8660-001-0462(6).

contract. The IOUs are authorized to record RA third party technical support costs in an appropriate account that allows for cost recovery from all distribution customers via distribution rates. Similar to actions we have taken in the past,[205] we will excuse other IOUs from these funding requirements, because their load is small.

8. Comments on Proposed Decision

The proposed decision of ALJ Chiv in this matter was mailed to the parties in accordance with Section 311 of the Pub. Util. Code and comments were allowed under Rule 14.3 of the Commission's Rules of Practice and Procedure. Comments were filed on _____, and reply comments were filed on _____ by _____.

9. Assignment of Proceeding

President Alice Reynolds is the assigned Commissioner and Debbie Chiv and Shannon O'Rourke are the assigned Administrative Law Judges in this proceeding.

Findings of Fact

1. Energy Division's proposed process to develop the MRD satisfies the Commission's direction in D.22-06-050 and is appropriate for use in the SOD framework.

2. Publication of the draft MRD to the Commission's website, requesting that generators respond with corrections to the MRD, and soliciting informal feedback from parties will ensure accurate representation of resources on the MRD.

3. Instructing Energy Division to modify and implement the MRD, as well as other adopted compliance and verification tools, will ensure consistency with the

[205] *See, e.g.*, D.18-02-018 at 150.

Commission's direction and ensure orderly implementation of the SOD framework.

4. SCE's LSE Showing Tool for LSEs to use to submit their monthly, 24-hour showings to the Commission satisfies the Commission's direction in D.22-06-050 and is an appropriate tool for use in the SOD framework.

5. CPA's proposed LSE Showing Tool to determine an LSE's energy sufficiency to charge all shown energy resources in the aggregate will better simplify the showing process for an LSE's storage resources.

6. Use of the monthly peak load ratio for CAM, RMR and DR allocations for all 24 slices is largely consistent with how CAM costs are recovered from customers.

7. Allocating CAM resources by resource class gives LSEs flexibility to show CAM resources to meet hourly requirements and simplifies allocations and LSE showings.

8. In D.22-05-050, the Commission determined that PG&E's exceedance methodology provided a sufficient means to determine solar and wind profiles that are benchmarked to stressed conditions. The exceedance levels recommended by PG&E required further development to ensure that the appropriate exceedance levels are benchmarked against a more robust data set.

9. Cal Advocates' 12-season approach, based on PG&E's Top 5 Day exceedance methodology, would result in more accurate approximation of a high-load day profile using historical production values. It is reasonable to add to the Top 5 days data set any days on which CAISO called a Flex Alert.

10. Six years of historical production data, with updates every year, provides a sufficient basis of data for the exceedance methodology.

11. EO resources can count towards the storage charging sufficiency requirement if the EO resource is charging on-site storage because on-site generation does not rely on the transmission system to deliver charging capacity to the co-located storage resource.

12. Hybrid components can be shown as separate assets on the MRD and LSE showings, as long as the total of each component does not exceed the interconnection amount in any hour.

13. In D.22-06-050, the Commission stated that if a UCAP-light mechanism cannot be developed, dispatchable resources shall continue to count at their Pmax value, as they do today, until a mechanism is developed. The Working Group did not develop a UCAP-light mechanism.

14. If a contractual agreement permits more than one cycle per day, storage resources can be allowed to show for multiple cycles per day provided that the LSE shows sufficient excess energy and time between discharge cycles to charge the battery.

15. In D.22-06-050, the Commission stated that Pmax or UCAP-light (if developed) shall apply to energy storage resources under the 24-hour framework. The Working Group did not develop a UCAP-light mechanism.

16. Requiring a DR resource to be shown for at least four consecutive hours during the AAH window is important to ensure DR resources are counted during the hours that are most critical for system reliability. The value of a DR resource should vary by hour to reflect the capability of DR resources.

17. Limiting the hours in which DR resources can be shown to a four-hour call window within the AAHs during the test year, specifically 5–9 p.m., would mitigate the complexity introduced by allowing DR resources to utilize 24-hour profiles and align the call window for DR year-round.

18. Requiring the hours when DR is shown by LSEs to be the same as the hours that were used in the *ex ante* LIP filing avoids altering the 24-hour SOD stack and ensuring the sum of the parts equals the whole.

19. There is consensus among parties to retain the TLF and DLF adders for the slice-of-day test year to apply to the QC of DR. Setting the value of the TLF adder at 0% for the slice-of-day test year minimizes the administrative burden to account for fractional MWs.

20. NRDC's calibration tool is appropriate to convert the results of the LOLE study to the SOD framework. SCE's calibration tool offers more granularity and precision by incorporating specific limitations of individual resources.

21. Retaining the MCC DR bucket for the SOD framework is necessary to ensure that use-limited resources are available throughout the compliance month and not over-relied upon in meeting the SOD requirements. Applying the DR bucket limit equally to each slice in the 24-hour framework avoids over-reliance on DR resources in any one slice.

22. Modifying the import RA rules adopted in D.20-06-028 to replace reference to the MCC bucket's current limitation ensures that import resources maintain the limitation established by the MCC buckets.

23. With the modification to the import rules and retention of the MCC DR bucket, the concerns with removing the MCC buckets have been addressed and there is no need to retain MCC buckets 1-4 for the SOD framework.

24. For the 2024 compliance year, it is reasonable to allow energy storage resources to be included in MCC bucket 4 provided that the LSE shows sufficient charging capacity.

25. Limiting showings for the 2024 SOD test year to a year-ahead compliance showing and a sample of month-ahead compliance showings reduces the burden

on LSEs (and Energy Division) that are simultaneously complying with the current RA requirements and showings.

26. It is important to align the Commission's and CAISO's compliance processes at the coincident peak hour to the extent possible.

27. Applying an average of a resource's hourly values during the AAHs balances CAISO's need for a non-zero QC value with the transition from the current RA program to the SOD framework.

28. To bring the new RA framework to full implementation, significant preparations before and during the 2024 test year are required, including development and refinement of the compliance and showing tools, analysis and evaluation of LSEs' compliance year-ahead and month-ahead showings, analysis and evaluation of the SOD rules and process, and development of a compliance filing portal and external facing user interface.

29. The California Legislature's Annual Budget Act gives the Commission certain specific and limited ongoing reimbursable expenditure authority. Prior to exercising this authority, the Commission must issue a decision that identifies the contracting activities to be undertaken by the Commission, and the costs subject to reimbursement by utility companies.

Conclusions of Law

1. Energy Division's proposed process to develop the MRD is reasonable and should be adopted for use with the SOD framework.

2. Energy Division should be authorized to modify and implement the compliance and verification tools adopted for use in the SOD framework, and to modify and implement instructions and additional filing procedures.

3. SCE's LSE Showing Tool approach is reasonable and should be adopted, with the modification that CPA's energy sufficiency charge mechanism should be incorporated into SCE's approach, to the extent possible.

4. CAM resources should be allocated by resource class and monthly peak load ratio should be used for CAM, RMR, and DR allocations for all 24 slices.

5. Cal Advocates' 12-season approach is appropriate and should be adopted as the exceedance methodology to determine profiles for solar and wind resources under the 24-hour SOD framework. Any days on which CAISO called a Flex Alert should be added to PG&E's Top 5 Days data set.

6. An EO resource should be eligible to count towards the storage charging sufficiency requirement if the EO resource is charging on-site storage.

7. Dispatchable resources should continue to count at their Pmax value.

8. Storage resources should be allowed to show for multiple cycles per day so long as the LSE shows sufficient excess energy and time between discharge cycles to charge the battery.

9. Energy storage resources should continue to count at their Pmax value.

10. For the 2024 test year, DR resources should be shown for four consecutive hours of 5–9 p.m., unless required by contract or tariff to be capable of responding to longer dispatches, in which case the shown hours must include all of 5-9 p.m. The value of DR resources should vary by hour based on the resource's capability on the worst day of the month under the 1-in-2 planning framework.

11. The TLF and DLF adders should be retained for the test year, with the value of the TLF adder at 0%.

12. NRDC's calibration tool is reasonable and should be adopted with the modification that individual resource limitation features of SCE's calibration tool should be incorporated into the tool.

13. The MCC DR bucket should be retained for the SOD framework. The status quo methodology should be used to the value of the MCC DR bucket limit.

14. The import RA rules adopted in D.20-06-028 should be modified to replace "consistent with the Maximum Cumulative Capacity buckets" with "every Monday through Saturday" to ensure consistency with the current RA import rules.

15. The MCC buckets 1-4 should not apply to the SOD framework.

16. Standalone energy storage may be included in MCC bucket 4 for the 2024 RA year, provided that an LSE demonstrates sufficient charging capacity.

17. The year-ahead showing for the test year should be submitted on November 30. Month-ahead compliance showings should be limited to March, June, and September.

18. The Commission should provide CAISO with (1) maximum showing values, (2) peak showing values, and (3) non-zero QC values to develop CAISO's NQC list and to ensure CAISO's visibility into the Commission's contracted fleet.

19. Appendix A containing the updated requirements and details of the 24-hour slice-of-day framework should be adopted.

O R D E R

IT IS ORDERED that:

1. Energy Division's proposed process will be used to develop the Master Resource Database (MRD) for use in the 24-hour slice-of-day framework. Energy Division is authorized to publish the draft MRD to the Commission's website,

with service to the service list in this proceeding, and request that generators respond with corrections to the MRD. Energy Division is authorized to solicit informal feedback from parties, compare feedback from generators with information in California Independent System Operator's Master File, and incorporate corrections and feedback into the MRD, as warranted. The MRD will be updated annually for deliverability and net qualifying capacity updates.

2. Energy Division is authorized to modify and implement the compliance and verification tools adopted for use in the 24-hour slice-of-day framework, and to modify and implement instructions and additional filing procedures, as necessary to ensure consistency with the Commission's direction and to ensure the orderly implementation of the slice-of-day framework and the changing needs of the Resource Adequacy program.

3. Southern California Edison's (SCE) load-serving entity (LSE) Showing Tool approach is adopted. Energy Division is authorized to implement Clean Power Alliance's energy storage sufficiency logic into SCE's LSE Showing Tool approach, to the extent possible. Energy Division is directed to publish a draft LSE Showing Tool on the Commission's website and solicit informal party comments.

4. Monthly peak load ratio will be used for the Cost Allocation Mechanism (CAM), Reliability Must Run, and demand response allocations for all slices in the 24-hour framework. Energy Division is directed to include energy sufficiency requirement allocations to load-serving entities using the CAM debit/crediting mechanism. CAM resources will be allocated by resource class. Energy Division is directed to determine the resource classes necessary to account for variation in the resources' daily profiles and use limitations.

5. The Public Advocates Office's 12-season approach is adopted as the exceedance methodology to determine profiles for solar and wind resources under the 24-hour slice-of-day framework. Any days on which the California Independent System Operator called a Flex Alert will be added to the Top 5 days data set. The exceedance methodology will be applied to historical data to generate technology (solar fixed/tracking/solar thermal) and regional profiles. Energy Division is directed to develop the solar and wind resource profiles, which will be incorporated into the Master Resource Database.

6. Six years of production data will be used as the basis for the exceedance methodology, with updates every year. If historical production data is not available, exceedance values will be calculated using modeled data for a minimum three years to populate the data set. The modeled data will be sourced from the Integrated Resource Plan proceeding's modeling. As resources in new areas generate historical production data, new data will be added to the data set and displace earlier years.

7. Hybrid resources will be characterized on the Master Resource Database (MRD) as either charging exclusively on-site or allowing grid charging. An energy-only (EO) resource is eligible to count towards the storage charging sufficiency requirement if the EO resource is charging exclusively on-site storage. The charging capacity of the renewable resource will be capped at the amount that can be used to charge the on-site storage and the storage will be capped at the interconnection limit. Hybrid components will be shown as separate assets on the MRD and load-serving entities' showings, and the total of the components must not exceed the interconnection amount in any hour.

8. The Pmax value will continue to be used as the basis for the qualifying capacity value of a dispatchable resource.

9. Storage resources that are operationally and contractually able to provide multiple cycles in a 24-hour cycle are allowed to be shown for multiple cycles per day, provided that the load-serving entity (LSE) shows sufficient excess energy and time between discharge cycles to charge the battery. The Master Resource Database will indicate if a storage resource can perform multiple cycles per day and the LSE Showing Tool will account for needed charging capacity.

10. The Pmax value will continue to be used as the basis for the qualifying capacity value of an energy storage resource.

11. For the 2024 test year of the slice-of-day framework, demand response (DR) resources must be shown for four consecutive hours of 5–9 p.m., unless required by contract or tariff to be capable of responding to longer dispatches, in which case the shown hours must include all of 5-9 p.m. The value of DR resources will vary by hour based on the resource's capability on the worst day of the month under the 1-in-2 planning framework. Snap back effects shall be included in the *ex ante* load impact protocol filings but will not be reflected in the Resource Adequacy capacity counting.

12. For the 2024 test year, transmission loss factor (TLF) and distribution loss factor (DLF) adders will be retained to apply to the qualifying capacity of demand response resources, but the value of the TLF adder for the test year will be 0%.

13. National Resources Defense Council's (NRDC) calibration tool is adopted to convert the results of the loss of load study to the 24-hour slice-of-day framework. Energy Division is authorized to incorporate individual resource limitations, provided by Southern California Edison's proposal, into NRDC's calibration tool. After Energy Division modifies NRDC's calibration tool, to the

extent possible, Energy Division is directed to publish the draft calibration tool on the Commission's website and solicit informal party comments.

14. The Maximum Cumulative Capacity buckets 1-4 are not applicable to the Resource Adequacy program under the 24-hour slice-of-day framework, beginning with the 2024 test year.

15. Standalone energy storage resources may be included in Maximum Cumulative Capacity bucket 4 for the 2024 Resource Adequacy (RA) compliance year, provided that the load-serving entity (LSE) demonstrates sufficient charging capacity through submission of the LSE's Showing Tool for the slice-of-day (SOD) framework. If an LSE elects to show standalone energy storage in bucket 4 in its 2024 RA compliance filing, the LSE must:

(a) Show sufficient charging capacity on the SOD LSE Showing Tool for each applicable month. The SOD LSE Showing Tool is due by the applicable compliance filing deadline (*i.e.,* October 31 for the year-ahead filing, 45 days before the compliance month for month-ahead filings).

(b) Submit the LSE's compliance filings for the current RA program, due by the applicable compliance filing deadline.

16. The Maximum Cumulative Capacity (MCC) demand response (DR) bucket is retained for the slice-of-day framework beginning with the 2024 test year. The status quo methodology for determining the MCC DR bucket limit will be used, based on gross load and 24 hours per month. The DR bucket limit will apply equally to each slice.

17. For the slice-of-day framework, beginning with the 2024 test year, a non-resource-specific import counts towards the Resource Adequacy (RA) requirements, provided that:

(a) The contract is an energy contract with no economic curtailment provisions.

(b) The energy must self-schedule (or in the alternative, bid in at a level between negative $150/MWh and $0/MWh) into the California Independent System Operator day-ahead and real-time markets at least during the Availability Assessment Hours every Monday - Saturday throughout the RA compliance month.

(c) The energy must be delivered to the load-serving entity in accordance with the governing contract.

18. For the 2024 test year, load-serving entities (LSE) shall submit a year-ahead compliance showing by November 30, 2023. Month-ahead compliance showings shall be limited to March, June, and September and shall be submitted by the first day of the showing month.

19. Energy Division is authorized to solicit informal feedback from parties after key milestones during the 2024 test year. Energy Division is directed to prepare a report summarizing comments and feedback after the year-ahead test showing to be submitted to the Commission by February 1, 2024.

20. The Commission will provide the California Independent System Operator (CAISO) with: (1) maximum showing values from load-serving entities (LSE), (2) peak showing values from LSEs, and (3) non-zero qualifying capacity values for each resource to develop CAISO's net qualifying capacity list and to ensure CAISO's visibility into the Commission's contracted fleet.

21. Beginning with the 2023-2024 fiscal year, the Commission authorizes expenditures for the implementation of the new Resource Adequacy framework of up to, but no more than $1 million annually for up to six years, for a total budget not to exceed $6 million. The maximum nominal value of a contract shall not exceed $6 million. The annual funds may be carried forward and expended

in a subsequent year. If not spent within six years, the funds may be spent in subsequent years, but may not exceed the maximum total.

22. The Commission's Executive Director will approve the expenditures and seek reimbursement from Pacific Gas and Electric Company, Southern California Edison, and San Diego Gas and Electric Company. Reimbursement will be sought from these three investor-owned utilities (IOU) on a proportional basis in relationship to their most recently available annual retail sales reported at the time of the start of the contract. The IOUs are authorized to record Resource Adequacy third-party technical support costs in an appropriate account that allows for cost recovery from all distribution customers via distribution rates.

23. Appendix A is adopted in its entirety. To the extent that the decision contains requirements or guidance for the 24-hour slice-of-day framework, in addition to those in Appendix A, the additional requirements or guidance shall be complied with.

24. Rulemaking 21-10-002 remains open.

This order is effective today.

Dated _____, at San Francisco, California

APPENDIX A

24-Hour Slice Framework

Appendix A

Appendix A Table of Contents

Note: Appendix A builds on and modifies the version of Appendix A adopted in Decision (D.) 22-06-050.

A. Structural Elements

The 24-hour slice-of-day (SOD) framework requires each load-serving entity (LSE) to demonstrate it has enough capacity to satisfy its specific gross load profile (including planning reserve margin) in all 24 hours on the California Independent System Operator's (CAISO) "worst day" in that month.

"Worst Day"

The "worst day" is defined as the day of the month that contains the hour with the highest coincident peak load forecast. This could evolve over time if some other attribute (*e.g.,* steepest ramping requirement) is found to be more challenging to reliability than the coincident peak.

Need Determination and Allocation

The California Energy Commission's (CEC) load forecast approach will be used to establish individual LSE hourly load forecasts. The CEC proposes an approach for adapting the current load forecasting process, which allocates a share of the total load

forecast to each LSE, to the SOD framework using submitted forecasts. The first step is to develop a reference forecast for each transmission access charge area by removing historical load shapes for non-Commission jurisdictional entities and removing automatic transmission load adjustment. The CEC proposes to apply an hour- and LSE-specific coincidence adjustment to LSE forecasts comparable to the current approach but focused on system peak hours. LSE forecasts may also be adjusted based on a comparison of LSE forecasts to a benchmark based on recorded loads, load migration activity, LSE forecast submittals, and weather-adjusted loads. The final step in the forecast determination process is to adjust all forecasts so that the sum is within 1% of the reference forecast. The CEC's outlined process for adapting the current load forecasting process to the 24-hour slice framework is reasonable. Modifications to the process may be addressed in a future phase of this proceeding.

Planning Reserve Margin (PRM)

LSEs must demonstrate sufficient capacity to meet their load requirements plus a PRM percentage in each hour ("Load+PRM"). For initial implementation, one PRM will apply to all hours of the year. The National Resources Defense Council's (NRDC) calibration tool will be used to convert the results of the loss of load expectation (LOLE) study to the SOD framework. Southern California Edison's (SCE) proposed calibration tool offers more granularity and precision by incorporating specific limitations of individual resources. Energy Division is authorized to incorporate the individual resource limitations, as proposed by SCE's proposal, into NRDC's calibration tool. Once Energy Division has modified NRDC's calibration tool, to the extent possible, Energy Division is directed to publish the draft calibration tool on the Commission's website and solicit informal party comments.

Capacity Required to Offset Storage Usage

To the extent an LSE uses energy storage to meet its Load+PRM requirement, the LSE must demonstrate it has excess capacity *(i.e.*, capacity that exceeds the LSE's hourly Resource Adequacy (RA) requirement) that offsets the storage capacity plus efficiency losses. In other words, LSEs must bring enough extra capacity to serve their own batteries.

Cost Allocation Mechanism (CAM) and RA Allocation

Monthly peak load ratio will be used for the CAM, Reliability Must Run, and demand response (DR) allocations for all slices in the 24-hour framework. CAM resources will be allocated by resource class. Energy Division is directed to include energy sufficiency requirement allocations to load-serving entities using the CAM debit/credit

mechanism. Energy Division is directed to determine the resource classes necessary to account for variation in the resources' daily profiles and use limitations.

B. General Requirements and Counting for RA Capacity

1. Requirements of RA Resources

No Unbundling of Attributes

Resource attributes and capabilities remain bundled across each compliance month and the existing full-capability/all-hour must-offer obligation is retained. Bundling resource attributes (*i.e.,* system, local, flexible) and capabilities across each compliance month aligns with the existing must-offer obligation because it ensures resources that have sold capacity also have a must-offer obligation equal to the sold amount for all hours they can produce. Resources can continue to sell portions of their capacity to different LSEs (*e.g.,* 70% of capacity sold to LSE 1 and 30% of capacity sold to LSE 2), but they cannot sell separate hourly products because that would effectively sell the same RA capacity multiple times.

Full-Capability Must-Offer Requirement

An RA resource must offer all its capability to CAISO for the quantity of RA shown by LSEs. CAISO's market will optimize resources consistent with bids and resource limitations across the compliance month.

Resources Must Be Deliverable to Provide RA

Resources must be deliverable to qualify to sell RA (and be included in the RA showing), as required today. Resources that are partially deliverable can only provide RA for the portion of the resource that is deliverable.

Profiles and Net Qualifying Capacity (NQC)

All resources will still have a single monthly NQC value representing the deliverability-adjusted peak-hour contribution. Most resource types will continue to utilize this NQC for their hourly showing while solar and wind will utilize hourly profiles. The Commission will provide three values to CAISO for each resource: the maximum showing value, the peak showing value, and a non-zero QC value. During the test year, the non-zero QC values will continue to be based on current QC methodologies as those will be the compliance values for 2024. Beyond the test year, an average of a resource's hourly values during the AAH will be provided to CAISO for the non-zero QC value.

Deliverability

The current on-peak deliverability study process shall continue to be used, with outputs in the 24-hour framework. A resource is deemed to be "fully deliverable" if its full modeled output can deliver to system load under summer peak load conditions, and "partially deliverable" if something less than its full modeled output can reach the grid. The "full deliverability" amount is not dependent on the Commission's resource counting, only CAISO's modeling.

2. Resource Counting

Resource capacity counting should be consistent with expected capacity contribution in the slice. The expected capacity contribution in a slice will depend on resource size, general type, special operational characteristics or limitations, deliverability status, and potentially location. These limitations will be identified through the development of the RA Master Resource Database (MRD). The database will also include tables reflecting solar and wind profiles.

Wind and solar resources will be assigned monthly 24-hour profiles based on the Public Advocates Office's exceedance methodology. Pacific Gas and Electric Company's Top 5 days data set will be modified to add any days on which CAISO called a Flex Alert. The exceedance methodology will be applied to historical data to generate technology (solar fixed/tracking/solar thermal) and regional profiles. Six years of production data will be used as the basis for the exceedance methodology, with updates every year. Where historical production data is not available, exceedance values will be calculated using modeled data for a minimum three years to populate the data set. The modeled data will be sourced from IRP modeling. As resources in new areas generate historical production data, new data will be added to the data set and displace earlier years. Energy Division is directed to develop the solar and wind resource profiles, which will be incorporated into the MRD.

Dispatchable resources (including resources not explicitly discussed elsewhere) will be assigned a single value based on Pmax. Dispatchable use-limited resources will also be subject to identified daily availability constraints.

Non-dispatchable resources will be assigned a single monthly value applied to all hours, based on the existing QC counting methodology, subject to availability constraints for each month.

Dispatchable hydro resources will be assigned a single monthly value applied to all hours based on the existing QC counting methodology.

Energy storage resources will be assigned value based on Pmax, restricted to daily resource capabilities (*e.g.*, maximum daily run hours, maximum continuous energy, and storage efficiency). Excess capacity must be shown to cover battery capacity with efficiency losses.

Storage resources that are operationally and contractually able to provide multiple cycles in a 24-hour cycle may be shown for multiple cycles per day, provided that the LSE shows sufficient excess energy and time between discharge cycles to charge the battery. The MRD will indicate if a storage resource can perform multiple cycles per day and the LSE Showing Tool will account for needed charging capacity.

Hybrid and co-located resources will utilize the existing QC methodology updated to use exceedance (rather than Effective Load Carrying Capability) in valuing the solar and wind portion of the resource and to account for charging losses. Hybrid resources will be characterized on the MRD as either charging exclusively on-site or allowing grid charging. An energy-only (EO) resource is eligible to count towards the storage charging sufficiency requirement if the EO resource is charging exclusively on-site storage. The charging capacity of the renewable resource will be capped at the amount that can be used to charge the on-site storage and the storage will be capped at the interconnection limit. Hybrid components will be shown as separate assets on the MRD and LSEs' showings, and the total of the components will not exceed the interconnection amount in any hour.

Import resources. Resource-specific imports will be assigned value based on the applicable counting rules for that particular resource type. Non-resource-specific imports will count based on the contract value, subject to the requirement that resources be at least four hours in duration.

For import resources under the SOD framework, a non-resource-specific import will count towards the RA requirements, provided that:

(a) The contract is an energy contract with no economic curtailment provisions.

(b) The energy must self-schedule (or in the alternative, bid in at a level between negative $150/MWh and $0/MWh) into the CAISO day-ahead and real-time markets at least during the Availability Assessment Hours every Monday–-Saturday throughout the RA compliance month.

(c) The energy must be delivered to the LSE in accordance with the governing contract.

Demand response resources. For the 2024 test year, DR resources shall be shown for four consecutive hours of 5-9 p.m., unless required by contract or tariff to be capable of responding to longer dispatches, in which case the shown hours must include all of 5-9 p.m. The value of DR resources will vary by hour based on the resource's capability on the worst day of the month under the 1-in-2 planning framework. Snap back effects shall be included in the *ex ante* load impact protocol filings but will not be reflected in the RA capacity counting. The transmission loss factor (TLF) and distribution loss factor (DLF) adders will be retained to apply to the qualifying capacity of DR resources, but the value of the TLF adder for the test year will be 0%.

Maximum Cumulative Capacity (MCC) buckets.

MCC buckets 1-4 will not be applicable for the SOD framework beginning in the 2024 test year. The MCC DR bucket will be retained for the SOD framework and the status quo methodology for determining the MCC DR bucket limit will be used, based on gross load and 24 hours per month. The DR bucket limit will apply equally to each slice.

These changes to the MCC framework are effective for the SOD framework beginning with the 2024 test year. As the current RA program will continue to utilize the MCC bucket structure for compliance purposes for the 2024 RA year, LSEs may show standalone energy storage in MCC bucket 4 for 2024, provided that the LSE shows sufficient charging capacity. To ensure that an LSE has sufficient charging capacity, if an LSE elects to show standalone energy storage in bucket 4 in its 2024 RA compliance filing, the LSE must:

(1) Show sufficient charging capacity on the SOD LSE Showing Tool for each applicable month. The SOD LSE Showing Tool is due by the applicable compliance filing deadline (*i.e.,* October 31 for the year-ahead filing, 45 days before the compliance month for month-ahead filings).

(2) Submit the LSE's compliance filings for the current RA program, due by the applicable compliance filing deadline.

C. Showing Mechanics

RA Master Resource Database

The Commission will maintain an official database of resources eligible to sell RA that includes their key attributes, as listed below. Resources must be fully represented in the MRD to be eligible for use in the Commission's 24-hour slice RA showing. The database shall include:

- Resource ID
- Available MW of RA capacity
- Hours available for production—represents the hours of its must-offer obligation and will set the parameters on how it can be shown in the Commission's RA showing
- Other use-limitations (*e.g.,* peaker permit limits)
- Max continuous energy and max daily energy MWh
- Charging efficiency (storage)
- Daily storage cycles (contractual and physical ability)
- Configurations (hybrid and co-located)
- Applicable hourly profile for solar and wind
- Allows charging exclusively on-site and allows for grid charging

Energy Division's proposed process will be used to develop the MRD for use in the 24-hour SOD framework. Energy Division is authorized to publish the draft MRD to the Commission's website, with service to the service list in this proceeding, and request that generators respond with corrections to the MRD. Energy Division is authorized to solicit informal feedback from parties, compare feedback from generators with information in CAISO's Master File, and incorporate corrections and feedback into the MRD, as warranted. The MRD will be updated annually for deliverability and net qualifying capacity updates.

Showing Template

A single system monthly RA showing shall cover all 24 slices. SCE's LSE Showing Tool approach is adopted. Energy Division is authorized to implement Clean Power Alliance's energy storage sufficiency logic into SCE's LSE Showing Tool approach, to the extent possible. Energy Division is directed to publish a draft LSE Showing Tool on the Commission's website and solicit informal party comments.

Compliance Verification

The Commission will verify the following to confirm an LSE has satisfied its RA requirements:

- **Resources are being shown within their capability.** The MRD is used to validate that LSEs have represented their contracted resources accurately.

- **Hourly requirements must be met or exceeded.** LSEs must show they have met hourly RA requirements.

- **Excess capacity must be shown to cover shown battery capacity.** LSEs must show they have enough excess capacity to cover all shown battery capacity (plus efficiency losses).

Penalty Process

The current Commission penalty framework, including the point system adopted in D.21-06-029, shall be applied when an LSE fails its monthly showing. An LSE "fails" the Commission showing if it fails to meet its requirement in any of the 24-hours; if the LSE fails in multiple hours, the penalty should be assessed based on the hour with the largest deficiency.

D. Contracting Mechanics

Existing Contracts

Existing contracts are expected to continue without modification or with minor changes under the 24-hour framework. RA attributes must continue to be bundled and contracted resources continue to have a must-offer requirement based on their operational capability and the amount of monthly RA capacity sold.

Transactability

The 24-hour framework will result in highly transactable RA products. RA capacity will continue to trade as it does today because it keeps all attributes "bundled." All market participants will know the RA capability of all resources on a 24-hour basis because the MRD will be public. This transparency will facilitate both direct contracting and secondary trading and will allow LSEs to pursue RA resources that best fit their needs.

E. Test Year Mechanics

For the 2024 test year, LSEs shall submit a year-ahead compliance showing by November 30, 2023. Month-ahead compliance showings shall be limited to March, June, and September and shall be submitted by the first day of the showing month.

Energy Division is authorized to solicit informal feedback from parties after key milestones during the 2024 test year. Energy Division is directed to prepare a report summarizing comments and feedback after the year-ahead test showings to be submitted to the Commission by February 1, 2024.

F. Tools Required for Implementation

Several new administrative tools must be developed to implement the 24-hour framework. The tools ensure that all parties agree on the RA capability of each resource, have sufficient information to design RA portfolios, can submit the showings, and can demonstrate compliance to the Commission.

RA Master Resource Database

- Contains a list of all resources (within the CAISO) eligible to sell RA, their resource ID, their maximum RA capacity, and hours of availability within a 24-hour window;
- For solar and wind, identifies the profile associated with the resource;
- For storage, includes the charging efficiency, maximum continuous energy, maximum daily energy, whether the resource is charging exclusively on-site or allows for grid charging and daily cycles;
- For hybrid and co-located resources, includes configurations to describe capabilities;
- Contains data for each month;
- Information is public and available to inform trading and resource portfolio development.

LSE Requirement Database

- This will populate the LSE allocation tab used in the LSE compliance showing;
- Contains the official requirements of each LSE (hourly load + PRM), by month, for all 24 hours;
- Is used by each LSE to determine its monthly 24-hour showing requirement;
- Is used by the Commission to ensure each LSE meets its monthly 24-hour showing requirement;
- Is developed by the Commission in communication with the CEC after the CEC finalizes the monthly, 24-hour load shape for each LSE;
- Database is non-public. Each LSE has access to only its requirements; the Commission has access to all data.

LSE Showing Tool

- Spreadsheet tool used by each LSE to submit their monthly, 24-hour showing to the Commission;
- Contains a standard format for listing the resources in an LSE's portfolio including the resource ID found in the Master Database, their MW quantity associated with the must-offer requirement, and the capacity used in each of the 24 hours of the showing;
- The tool should include pass/fail logic identical to the Commission Verification Tool, so LSEs know in advance if they will pass Commission verification;
- This showing may also be used to provide CAISO the information it will need to determine the must-offer requirements of all resources, and the correct RA capacity values to use when performing their single-hour deficiency test.

Commission Verification Tool

- The tool is designed to use the data submitted through the LSE Showing Tool;
- The Commission uses the data submitted by the LSE in its showing, in conjunction with the RA Resource Master Database, which will include solar and wind profiles to determine if an LSE passes the 24-hour RA requirement in each month;

- The tool contains basic logic to ensure the showing is consistent with the capabilities of the resources submitted, that sufficient capacity has been brought to meet the LSE's requirement in all 24 hours, and that sufficient excess capacity has been shown to meet the capacity requirements for storage;

- LSEs must pass all 24 hours, all logic tests, and the excess capacity requirement to pass the showing;

- The tool notes any hour(s) of failure along with the maximum capacity shortfall within the 24 hours.

(END OF APPENDIX A)