

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking To Integrate and Refine Procurement Policies and Consider Long-Term Procurement Plans.

R.13-12-010
(Filed Dec. 19, 2013)

**COMMENTS OF THE UNION OF CONCERNED SCIENTISTS AND SIERRA CLUB
ON KEY TECHNICAL QUESTIONS FOR PARTIES IN RESPONSE TO DECEMBER
18TH, 2013 WORKSHOP ON PLANNING ASSUMPTIONS AND SCENARIOS FOR USE
IN THE CPUC 2014 LONG TERM PROCUREMENT PLAN PROCEEDING AND THE
CAISO 2014-2015 TRANSMISSION PLANNING PROCESS**

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Pursuant to the December 19, 2013 email ruling of Administrative Law Judge Gamson, the Union of Concerned Scientists (“UCS”) and Sierra Club respectfully submit these timely comments on Key Technical Question for Parties in Response to December 18th, 2013 Workshop on Planning Assumptions and Scenarios for Use in the CPUC 2014 Long Term Procurement Plan Proceeding and the CAISO 2014-2015 Transmission Planning Process.

INTRODUCTION

California has set greenhouse gas emission reduction targets in an effort to avoid the catastrophic impacts projected with higher emissions scenarios. Assembly Bill (“AB”) 32 requires California to return to 1990 levels of greenhouse gas emissions by the year 2020.¹ Looking beyond 2020, Executive Order S-3-05 sets an emissions reduction target of 80 percent below 1990 levels by 2050.² Through its update to the AB 32 Scoping Plan, the State has already begun to “chart[] the path that California must continue to take in a number of key sectors to steadily drive down GHG emissions as we approach 2020 and begin to look further in

¹ Health & Saf. Code, § 38550.

² Exec. Order S-3-05.

the future.”³ Reaching the 2050 target will require “California to accelerate the pace of emissions reductions that we achieve in the coming decades” and a “continued commitment to changing how we generate, transmit and consume electricity.”⁴ With regard to the energy sector, the Scoping Plan Update states that “California will need to continue to transform the energy sector with wholesale changes to its current electricity and natural gas systems” and “develop[] a near zero emission strategy for the energy sector.”⁵

California’s emission reduction targets are based on scientific evidence of the reductions necessary to reduce the risk of catastrophic climate change.⁶ As recognized in the Scoping Plan Update, failure to achieve these targets would have “grave consequences” for California including “[i]ncreasingly dangerous heat waves, more frequent and prolonged drought, diminished snowpack, continued sea level rise, extreme wildfires and the devastating economic impacts associated with these changes.”⁷

Given the importance of California’s greenhouse gas emission reduction goals to the wellbeing of the state, the guiding principles and scenarios should focus on meeting California’s climate goals. Guiding Principles A and E should be rewritten to indicate that the Commission is planning for the achievement of these goals.

California has made tremendous strides in clean energy generation investments in the past decade due largely to the successful implementation of the Renewables Portfolio Standard (“RPS”), which has positioned the state as a global leader in renewable energy investments. The 33 percent by 2020 RPS mandate has been a cornerstone program that has helped the state reach

³ Exhibit (“Ex.”) 10-B, Attachment 21 at ES-4 (Powers, Sierra Club) (excerpts of AB 32 Scoping Plan Update).

⁴ *Id.* at ES-3.

⁵ *Id.* at ES-4.

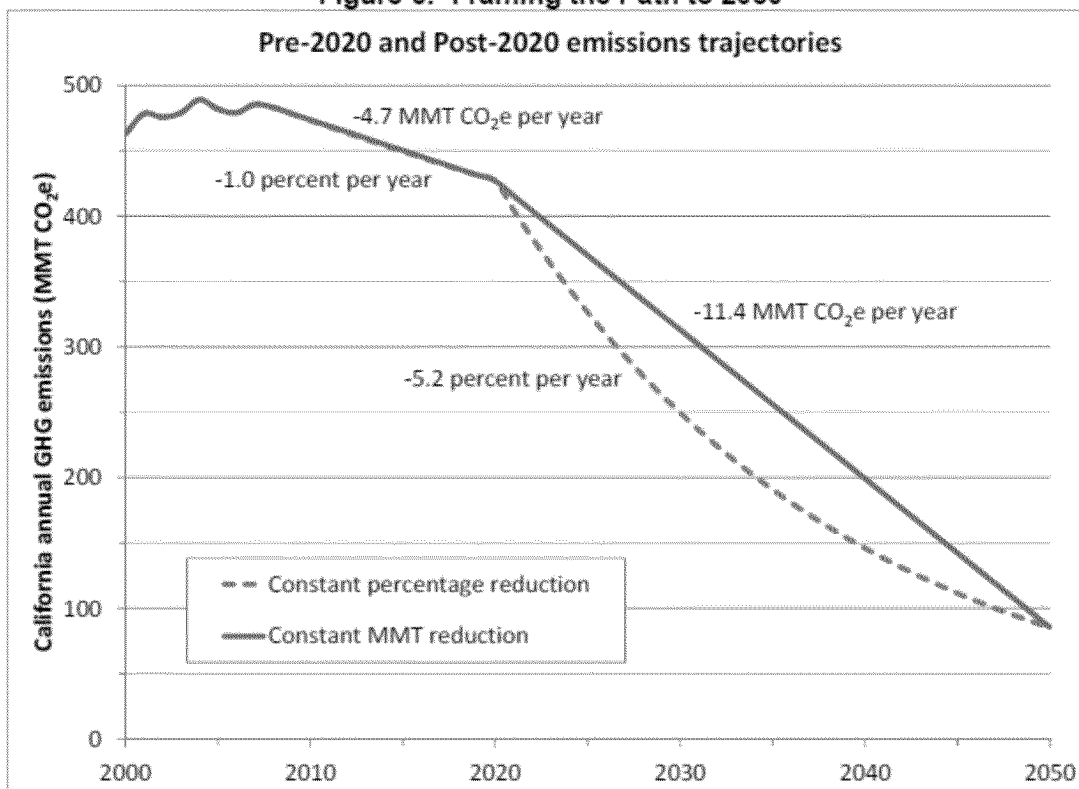
⁶ *Id.* at ES-3.

⁷ *Id.*

the greenhouse gas emission reductions required by AB 32 through investments in cleaner generation resources that, as an added benefit, make the electricity grid more diverse. Yet, the RPS portfolio assumptions in most of the proposed scenarios are set at overly conservative level of 33% by 2024. This assumption suggests no continued progress on increasing the RPS beyond the 33% mandated for 2020 even though California's utilities are well on their way to achieving the 33 percent RPS requirement, and some are even on track to surpass this mandate in that timeframe. Moreover, with the passage of AB 327, the Commission has the authority to adopt a RPS higher than 33%. Accordingly, the planning scenarios' assumption that the renewable resources will remain at 33% through 2024 is inconsistent with likely continued renewable deployment and the State's climate objectives. UCS/Sierra Club believe that it is more realistic for the 2024 planning scenarios to assume 40% renewables by 2024. Assuming 40% renewables by 2024 will also ensure adequate plans are made to expand renewable energy deployment in a cost-effective and orderly manner.

With regard to 2030 scenarios, UCS/Sierra Club recommend two different scenarios to reflect an upper and lower bound of preferred resource investments the State could make to position itself on a track to making needed cuts in greenhouse gas emissions by 2050, as supported by the Air Resources Board's AB 32 Scoping Plan Update and shown in the chart below:

Figure 6: Framing the Path to 2050



A scenario that explores an RPS of at least 50% by 2030 is consistent with the existing deployment rate of renewable resources and a lower bound of 2050 emission reduction trajectory. UCS/Sierra Club believes that a 50% RPS is not only achievable, but essential to reducing greenhouse emissions traditionally associated with the electricity sector. A transition of this magnitude requires long-term policy signals to shape necessary planning and investments. Without an escalated RPS mandate for 2030, near-term decisions and investments in electricity generation resources and related infrastructure could preclude a cost-effective transition to clean energy. In addition, UCS/Sierra Club recommends that an additional scenario, an Expanded Preferred Resources/Aggressive Climate Scenario, should be bench-marked to California's 2050 climate reduction goals. This scenario would assume a higher mix of preferred resources that will be necessary to achieve the 2050 climate goal. This scenario should contain aggressive

assumptions on energy efficiency investments, additional investments in demand response, storage, and will likely require an RPS that's significantly higher than 50%. This scenario, with its mix of resources, will help the Commission better understand the value and implications of different preferred resource investments and allow the Commission to explore a more aggressive emission reduction case. Indeed, given the unexpected severity and speed with which the world is experiencing climate impacts, more aggressive GHG reductions will likely be needed to limit future warming to below catastrophic levels. Creating scenarios using two renewable assumptions higher than currently contemplated is critical to understanding the policy mechanisms that may be necessary to meet California's greenhouse gas emission reduction targets.

As this proceeding considers issues of operational flexibility needs, the Commission should not simply move the goal posts for procurement decisions, but should focus on how we can effectively use the demonstrated over-abundance of existing capacity to integrate renewable resources. In past LTPPs, load and resources analysis of net system balances showed that the system has more than enough capacity to meet demand and provide a planning reserve margin. As Sierra Club and others have highlighted in previous comments in the 2012 LTPP, should the next stage of analysis demonstrate a system *operational* need, the Commission, IOUs, and CAISO should explore *operational* solutions rather than simply adding more *capacity* to a system that already has surplus capacity. Using existing resources in a more sensible way promises to be cheaper for ratepayers and more consistent with State policies than procuring new fossil-fueled resources.

Before approving any additional capacity, the Commission must direct the IOUs and CAISO to explain why these operational solutions will be inadequate. To the extent operational

fixes are insufficient, the analysis should next explore solutions that would obviate the need for new capacity, such as the addition of storage, flexible demand response, and energy efficiency. As the loading order dictates, only once cost-effective demand-side options have been exhausted should procurement of new capacity be considered, and then such procurement should give preference to renewable resources.

Below UCS/Sierra Club address the questions posed by ALJ Gamson.⁸

Questions and Responses

1. Is the current range of scenarios sufficient to cover current policy issues facing the CPUC?

As explained in the introductory remarks in these comments, UCS/Sierra Club do not believe that the currently proposed scenarios reflect Guiding Principle A, which urges the scenarios to reflect a “realistic view of the expected policy-driven resource achievements.” Since electricity resource policy goals have and are being developed in the state to position California for deep greenhouse gas emission reductions in future decades, UCS/Sierra Club believe that the 2014 LTPP presents an important and unique opportunity for state policymakers to begin analyzing the impacts of specific low-carbon investments that must be made in order to significantly reduce greenhouse gas emissions. UCS/Sierra Club do not believe the current scenarios achieve this goal. UCS/Sierra Club provide specific recommendations for how the scenario assumptions should be modified to effectively use the LTPP to plan for greenhouse gas emission reductions. UCS/Sierra Club only provide comments on scenario assumptions that

⁸ Given that the comment period overlapped with the holidays and previously planned vacations, some responses to questions are more at the conceptual level, UCS/Sierra Club are willing to further develop those points with Commission staff.

should be modified; if a specific assumption is not mentioned, that means that UCS/Sierra Club either support the staff's current proposal, or do not have a comment at this time.

Trajectory Scenario:

RPS Portfolio

As explained in comments above, UCS/Sierra Club believe that assuming the state will achieve a 33% RPS by 2020 and cease to make additional renewable energy investments is not only an overly conservative assumption, but an important missed opportunity to analyze the impacts of additional renewable energy investments on the grid. Failing to assume the country's largest renewable energy program will continue to grow after 2020 may result in the Commission wasting a valuable opportunity to begin discussions on a more orderly and cost-effective way to continue renewable energy investments in the state. Therefore, UCS/Sierra Club urge the Commission to modify its RPS assumptions to assume a 40% RPS by 2024. This is consistent with the current rate of renewable energy investment in the state and the Commission's own authority under AB 327 to require additional renewable energy investments beyond the current 33% mandate.

Trajectory – TPP Local Area Reliability and Bulk System Reliability

RPS Portfolio

UCS/Sierra Club urge the Commission and the CAISO to assume a 40% RPS by 2024 for the reasons stated above.

Trajectory – TPP Policy Studies and Economic Studies

Incremental Demand-side PV

UCS/Sierra Club do not believe that the “low incremental PV” assumption added to the demand-side assumptions in several scenarios, including the “TPP-Policy” and “TPP-Economic”

scenarios is large enough to provide a meaningful difference between scenarios. UCS/Sierra Club believe this additional demand-side PV assumption should be larger to better reflect the existing growth trends in solar. Specifically, UCS/Sierra Club suggest assuming an additional 5,430 MW of demand-side PV is installed. UCS/Sierra Club provides a detailed explanation of the basis for this recommendation in its response to Question 9.

RPS Portfolio

UCS/Sierra Club urge the Commission to assume a 40% RPS by 2024 for the reasons stated above.

High Load

AA-EE

UCS/Sierra Club believe that the Commission's assumptions for AA-EE in the "High Load" scenario are too low. Higher economic growth conditions (as assumed in the "High Load" scenario) result in relatively higher building construction rates and overall energy consumption, creating more opportunities to capture energy efficiency savings. Customers have more disposable income to invest in energy efficiency upgrades, and access to capital or credit can be expanded. In addition, relatively more buildings are constructed and appliances purchased, which creates additional opportunities to make energy efficiency investments. For these reasons, UCS/Sierra Club recommend incorporating the CEC's High-Mid assumption of AA-EE into the "High Load" scenario.

RPS Portfolio

UCS/Sierra Club urge the Commission and the CAISO to assume a 40% RPS by 2024 for the reasons stated above.

Diablo Canyon Retirement by 2024

RPS Portfolio

UCS/Sierra Club urge the Commission to assume a 40% RPS by 2024 for the reasons stated above.

High DG

Incremental Demand-side PV

UCS/Sierra Club do not believe that the “low incremental PV” assumption added to the demand-side assumptions in several scenarios, including the “TPP-Policy” and “TPP-Economic” scenarios is large enough to provide a meaningful difference between scenarios. UCS/Sierra Club believe this additional demand-side PV assumption should be larger to better reflect the existing growth trends in solar. Specifically, UCS/Sierra Club suggest assuming an additional 5,430 MW of demand-side PV is installed. UCS/Sierra Club provides a detailed explanation of the basis for this recommendation in its response to Question 9.

RPS Portfolio

UCS/Sierra Club urge the Commission and the CAISO to assume a 40% RPS by 2024 for the reasons stated above.

40% RPS in 2030

As previously stated, UCS/Sierra Club strongly believe the 2014 LTPP presents an important and unique opportunity for the state to begin exploring electricity scenarios that will position the state to make deep emission reductions between now and 2050. UCS/Sierra Club believe it would be very valuable for the Commission to explore two scenarios in the 2014-2024 timeframe that reflect an upper and lower bound of what investments in preferred resources would be needed by 2030.

AA-EE

UCS/Sierra Club believe that even a conservative analysis of necessary preferred resource investments by 2030 should assume high levels of energy efficiency investments. For this reason, UCS/Sierra Club recommend the Commission assume the High-Mid assumption for AA-EE into this scenario.

RPS Portfolio

UCS/Sierra Club believe that simply running a 40% RPS by 2030 dramatically underestimates the additional clean energy investments that the state must make in order to be in a position to meet 2050 emission targets. Moreover, UCS/Sierra Club believe that the state is much more likely to reach 40% renewables in the 2020-2024 timeframe, and that a 50% RPS by 2030 is achievable with reasonable planning. UCS/Sierra Club believe that running a 40% RPS by 2030 would not be an effective use of Commission staff resources, dramatically misrepresent the renewable investment growth expected for the next decade, and fail to provide stakeholders with meaningful planning information that should be used to determine the most appropriate pathway forward for the state's clean energy programs. Therefore, UCS/Sierra Club urge the Commission to adjust this scenario to a 50% RPS by 2030.

Expanded Preferred Resources / Aggressive Climate Goals

UCS/Sierra Club believe it is important that the Commission use the 2014 LTPP process to analyze at least one scenario that assumes aggressive levels of investments in preferred resources by 2030—additional energy efficiency, renewable energy with a higher percentage of distributed resources, demand response, storage—so that the state can begin the necessary planning processes in order to make deep reductions in electricity sector carbon emissions. UCS/Sierra Club commend the Commission for proposing a “Expanded Preferred Resources”

scenario and offer recommendations below regarding how that scenario should be adjusted to capture more meaningful results that could be used to understand future investments the state must make to dramatically decarbonize the electricity grid.

Incremental Demand-side PV

UCS/Sierra Club has provided recommendations on how to adjust the incremental demand-side PV assumptions for the “TPP Policy Studies”, “TPP Economic Studies” and “High DG” scenarios. In this scenario, given the need to understand the implications of higher levels of preferred resources, UCS/Sierra Club suggest the Commission increase the incremental demand-side PV recommendation by at least an additional 15% than in other scenarios.

Storage Additions

Consistent with a visionary scenario that makes dramatic and necessary investments to decarbonize the electricity grid by 2030, UCS/Sierra Club believe it would be reasonable and appropriate for the Commission to assume additional storage investments in this scenario. UCS/Sierra Club recommend additional storage be modeled as a supply-side resource. Since the storage mandate established by D.13-10-040 is intended to transform the energy storage market in CA, UCS/Sierra Club believe it is reasonable to assume that the amount of storage capacity on the system doubles between 2020 and 2030. Therefore, UCS/Sierra Club recommend the Commission assume at least 2.6 GW of storage capacity is deployed on the grid by 2030.

RPS Portfolio

As explained above, UCS/Sierra Club believe it would be useful for the Commission to analyze two 2030 scenarios that represent the lower and upper bound of preferred resource investments that the state would need to make by 2030 to ensure success in meeting 2050 emission reduction goals. While a “lower bound” 2030 scenario (as explained in our

recommendations on a 50% RPS by 2030 scenario above) would assume higher amounts of additional energy efficiency investments and a 50% RPS by 2030, UCS/Sierra Club suggest that the Expanded Preferred Resources scenario explore the potential for significantly higher levels of renewables. Since the ability to integrate very high levels of renewable energy onto the grid cost-effectively will likely depend on successfully scaling up storage investments, demand response, and enhancing coordination between balancing authorities, UCS/Sierra Club hesitate to lock in a specific RPS number at this time. Both organizations would be happy to work with Commission staff to provide a more specific recommendation on this point at a later date. At this point, UCS/Sierra Club would like to emphasize the need to analyze the impacts of *at least* a 50% RPS by 2030 and explore the potential for significantly more renewables in the Expanded Preferred Resources scenario.

- 2. Are there any technical errors in the proposed scenarios, scenario tool, or RPS Calculator? For any identified errors, please be very specific in your comments including the location of the error and the correct value, including the source for the revised value. If appropriate, please provide a revised spreadsheet showing any corrected values. Some example questions to consider in identifying factual errors are:**
 - a. Are any resources counted twice or inappropriately left out of the analysis?**
 - b. Are any numbers cited in the proposed scenarios or spreadsheets inaccurate relative to the intended sources?**
 - c. Are there any errors in the renewable generation project data in the 33% RPS Calculator?**

Deliverability:

UCS/Sierra Club are concerned about the implications of applying the CAISO's TPP assumption that all of the generation facilities represented in the renewable resource portfolios provided by the Commission are fully deliverable. There is currently no requirement that all RPS resources be deliverable, and the state is in a position of substantial system-wide oversupply with

regards to RA capacity. In addition, the state will gain additional RA resources out of the 2012 LTPP Track 1 and 4 decisions and the storage mandate established in D.13-10-040. UCS/Sierra Club are concerned that assuming all RPS resources are fully deliverable may overstate transmission investment needs and costs. For this reason, UCS/Sierra Club suggest that the Commission include the average transmission reliability upgrade cost for central station renewables and the average distribution reliability upgrade cost for distributed renewables.

Imports and Regional Coordination:

UCS/Sierra Club believe that the Commission should not make uniform assumptions about imports for every scenario it runs in the 2014 LTPP. In February 2013, the California ISO and PacifiCorp entered into a memorandum of understanding to create a regional real-time energy imbalance market (EIM) by October 2014. The purpose of this regional market is improving management of the transmission system by balancing supply and demand across a larger area. It is conventional wisdom that expanding regional coordination among balancing authorities will be critical to integrating large amounts of renewable energy onto the electricity grid. Although the EIM is not intended to influence planning decisions within balancing authorities at this point, UCS/Sierra Club believe it is important for the Commission to explore at least one scenario that assumes much higher levels of regional coordination between balancing authorities than happens today. For this reason, UCS/Sierra Club suggest that the import assumptions for the “50% by 2030” and “Expanded Preferred Resources / Aggressive Climate Goals” scenarios both assume additional regional coordination, including the ability to scale-up both imports and exports of electricity.

3. Should Diablo Canyon be assumed online or retired in the Trajectory case?

UCS/Sierra Club recommend that the “Trajectory” scenario assume that Diablo Canyon is retired in 2024-2025. The Commission should not presume that Diablo Canyon will be relicensed. On the other hand, it is prudent to run an additional scenario where Diablo Canyon is operational throughout the study period.

4. Is the treatment of energy storage for capacity value reasonable?

UCS/Sierra Club do not believe assuming zero capacity value for distribution and customer-sited storage is appropriate. During the Energy Storage OIR, the modeling showed that distribution level storage would be most cost-effective at two to four hour durations because it provided a much broader range of services and captured more value (e.g., upgrade deferral, potential RA value, and participation in capacity markets) than if the storage was only capable of voltage support and ancillary services (which longer duration storage can also provide). Because short duration distribution level storage does not have as high a value proposition as longer duration storage and AB 2514 requires that any energy storage procurement be cost-effective,⁹ it is unreasonable to assume distribution level storage will not contribute to peak capacity needs. In Track 4, of the 2012 LTPP, Sierra Club argued that the Commission should maximize the value of the storage mandates by requiring SCE and SDG&E to use procurement acquired through the storage mandate towards the local capacity requirements. Because RA requires providing capacity for a four-hour period and distribution level storage may be between two and four hours, we recommend counting at least 75% of distribution-level storage capacity in the planning scenarios.

Similarly, customer-sited storage should be considered dispatchable or responsive to time of use prices because implementation of well-designed tariff structures that can incentivize

⁹ Public Utilities Code § 2836(b)(1)

provision of energy during peak periods.. Therefore, UCS/Sierra Club recommend that the Commission assume between 25% and 50% of customer sited storage is available to meet peak capacity needs.

- 5. For existing resources that do not have announced retirement dates, Staff may assume a resource retires based on facility age. Facility age is calculated from Commercial Online Date, but the COD may not be available for some resources. If no COD is available, is it reasonable to assume the resource does not retire within the planning horizon? If not, please provide an alternate methodology and justification from a public data source as needed.**

UCS/Sierra Club do not have a comment on how to handle resource retirements when the COD is unknown, however both organizations would like to caution the Commission more generally that retiring existing resources based on facility age may not be an appropriate assumption, especially where turbines are not frequently utilized and/or may have undergone an overhaul. Before a resource is automatically retired in a scenario based on its age, Commission staff should confirm that the total hours of operation of the facility's turbines roughly equate to the operational hours expected for the turbines lifetime. If a turbine's hours of operation are significantly less than the total hours the turbine is expected to be able to operate before retirement is needed, retirement of a resource should not necessarily be assumed.

- 6. How should the capacity value of energy storage, demand response, and demand side resources (PV, CHP) be allocated to small geographic regions and/or busbars and how should the capacity value be adjusted to account for locational and operational characteristics uncertainty?**

Energy Storage:

Through the upcoming request for offers process as part of the energy storage mandate, the Commission and IOUs have significant control over where energy storage will be procured. Because the storage procurement process requires a finding of cost effectiveness, the Commission should assume storage is deployed in high value locations. Energy storage will be most cost effective in those local capacity resource areas where deployment will avoid

procurement of new generation (e.g. LA Basin and SDG&E service territory). Since peak capacity might not be needed on a system-wide basis for the 2014-2024 planning period, capacity from energy storage may not be as valuable outside these areas. UCS/Sierra Club therefore recommend that Commission assume the vast majority of energy storage is deployed in these smaller transmission constrained geographic regions. Incorporating this assumption will also send an important signal to developers and IOUs that this is a Commission expectation as the storage procurement commences.

Demand Response:

The capacity value of demand response resources should not be reduced in local area studies based on the “fast response” criteria. DR resources that do not meet those criteria can still meet local area need. The system operator can commit those resources ahead of time, as is done for other local capacity resources.¹⁰ CAISO’s “fast response” criteria are conservative relative to other ISOs and RTOs across the nation: DR resources deployed in other ISOs and RTOs “simply must be located in the local area and dispatched as instructed by the ISO or RTO” to qualify as local capacity resources.¹¹ Furthermore, CAISO expressed uncertainty in its valuation of demand response resources as local capacity resources during Track 4 of the 2012 LTPP and expected more clarity from forthcoming studies, including the transmission plan.¹²

Demand Side Demand Response:

In estimating demand-side demand response reductions, the 2014 LTPP Planning Scenarios rely on the CEC’s Demand Forecast which assumes that peak demand reductions

¹⁰ R.12-013-014, Sierra Club California. (Dec. 16, 2013) Reply Brief of Sierra Club California in Track 4, p. 11.

¹¹ R.12-013-014, EnerNOC. (Nov. 25, 2013) Opening Brief of EnerNOC, Inc., in Track 4 (San Onofre Nuclear Generating Station), p. 16.

¹² R.12-013-014, Environmental Defense Fund. (Nov. 25, 2013) Opening Brief of Environmental Defense Fund on Track 4 of the Long-Term Procurement Planning Docket, p. 3.

plateau between 2014 and 2017. This assumption serves to significantly understate future peak reductions that can reasonably be expected. Assembly Bill 327 recently authorized the Commission to implement default time-of-use (TOU) residential rates in 2018. Consistent with this authorization, Commission staff have recently proposed a rate structure that would implement default TOU residential rates in 2018.¹³ Estimates of peak savings from TOU rates are significant and much higher than the 72 MW of total reduction assumed in the demand forecast.¹⁴ For example, in an analysis in the Residential Rate OIR, the Environmental Defense Fund estimates that 50% participation in TOU rates would yield over 2,000 MW of peak load reduction.¹⁵

Despite the significant possibility that the Commission will implement TOU residential rates within the first 10-year planning period of the 2014 LTPP, none of the proposed scenarios assume any increase in demand-side DR. Therefore, UCS/Sierra Club request the Commission build in an assumption for demand-side DR resulting from TOU residential rates starting in 2018 for at least the Expanded Preferred Resource / Aggressive Climate Goals scenario.

Supply Side Demand Response:

UCS/Sierra Club believe that the 2014 LTPP Planning Assumptions should also assume the growth of supply-side demand response resources over the next decade. The IOU's load impact reports forecast stagnated growth in DR programs. SCE, for example, does not forecast any growth in the DR portfolio aggregate load impact after 2017, and SDG&E shows no growth

¹³ CPUC, Staff Proposal for Residential Rate Reform in Compliance with R.12-06-013 and Assembly Bill 327, Jan. 3, 2014.

¹⁴ CEC, California Energy Demand 2014-2024 Final Forecast, v.1, at 36. (Dec. 2013)

¹⁵ R.12-06-013, EDF, Response to The Utility Reform Network's (TURN) Reply Comments in the Residential Rate Rulemaking, p. 8.

after 2014. PG&E’s forecast vacillates from 2017 to 2023, with only minimal cumulative growth, as seen in the table below.

Year	SCE ¹⁶ Portfolio aggregate load impact estimate, August, 1-in-2 weather conditions (MW), Supply-Side*	SDGE ¹⁷ portfolio load impact estimate, August, 1-in-2 weather conditions (MW), Supply-Side*	PGE ¹⁸ portfolio adjusted average hourly load impact, August, 1-in-2 weather conditions (MW), Supply-Side*
2013	1196	38.7	839
2014	1239	39.8	890
2015	1255	39.8	903
2016	1259	39.8	905
2017	1261	39.8	907
2018	1261	39.8	908
2019	1261	39.8	909
2020	1261	39.8	911
2021	1261	39.8	912
2022	1261	39.8	914
2023	1261	39.8	915

***Forecasts for Critical Peak Pricing, Peak Time Rebate, Permanent Load Shifting, and Peak Day Pricing programs were subtracted.**

The reasons behind the forecasts’ plateaus differ based on the IOU and specific program in question, but uncertainty was a major factor in many of the forecasts. For example, PG&E’s Base Interruptible Program (DBP) stagnates in 2014 because PG&E does not yet know what the BIP program design will be post-2014. In turn, PG&E’s Demand Bidding Program’s growth is curtailed post-2014 because it is linked to the BIP.¹⁹ SDG&E anticipates that enrollment in many

¹⁶ Southern California Edison's 2012 Demand Response Load Impact Evaluations Portfolio Summary, Table 5-1

¹⁷ Appendix A of Executive Summary of the 2012 SDG&E Load Impact Reports, April 2, 2013, https://www.sdge.com/sites/default/files/regulatory/Appendix%20A%20Executive%20Summary_2012%20DR%20Forecast%20pdf.pdf

¹⁸ Appendix B of 2013-2023 Demand Response Portfolio of Pacific Gas and Electric Company

¹⁹ Executive Summary: 2013-2023 Demand Response Portfolio of Pacific Gas and Electric Company, April 2, 2013, p. 17.

of its programs, such as the Summer Saver Program and the Capacity Bidding Program, will not change.²⁰

These anemic forecasts are in conflict with the work being done at the Commission and CAISO to grow demand response programs. The Commission expressed confidence in the growth of demand response in the 2012 LTPP Track 1 decision, and recently opened a proceeding to facilitate that growth.²¹ CAISO is working on a methodology that will decide how DR resources can be used instead of transmission or generation in areas with limited capacity.²² It is reasonable to assume that not only will demand response resources grow, but they also will be better able to meet system and local area needs. In fact, an analysis by the Brattle Group recently found that demand response could reduce peak demand in California by 13% in 2022 and 13.3% in 2032.²³ Rather than adopting these forecasts as is, the Commission should adjust them to include sensible growth estimates for all scenarios. Additionally, the Expanded Preferred Resources / Aggressive Climate Goals scenario should have a high DR growth assumption that reduces peak demand by 13%.

7. **Decision (D.13-10-040) established storage goals for each of three categories – transmission, distribution, and customer-side of the meter, but does not specify the function(s) to be provided. Should storage modeling be focused on deep multi-hour cycling to support operational flexibility or rapid cycling for ancillary services? How should the production profile of each category of storage identified in the CPUC Storage Target Decision be modeled – as a fixed profile or as a dispatchable resource?**

Given the fact that storage procurement will need to meet a cost-effective test, UCS/Sierra Club believe it is reasonable to assume that storage investments will be largely

²⁰ Executive Summary of the 2012 SDG&E Measurement and Evaluation Load Impact Reports, April 1, 2013, pp. 9, 35

²¹ R.12-013-014, Reply Brief of Sierra Club California in Track 4 (Dec. 16, 2103), p. 10.

²² Ibid.

²³ The Brattle Group. (Jun. 19, 2012) WECC 20-year Demand Response Forecast, slide 25. Retrieved from: <http://www.westgov.org/sptsc/workgroups/dsmwg/documents/2012/06-20-12WECCdrf.pdf>.

dispatchable. (See response to Question 4 for more detail). In addition, UCS/Sierra Club believe it will be important to make storage investments that can provide the greatest range of grid benefits, including multi-hour cycling and faster-responding ancillary services. In other words, it should not be an “either/or” decision as long as the technology allows the device to provide more than one type of services and benefits.

- 8. Should incremental small PV and small CHP on the customer side of the meter be modeled as demand-side load reduction or supply side generation? How should the production profile of each resource type be modeled? Should the same modeling convention be used in all 2014 LTPP and 2014-15 TPP studies or may specific studies make this decision in a manner best suited to the topic being studied?**

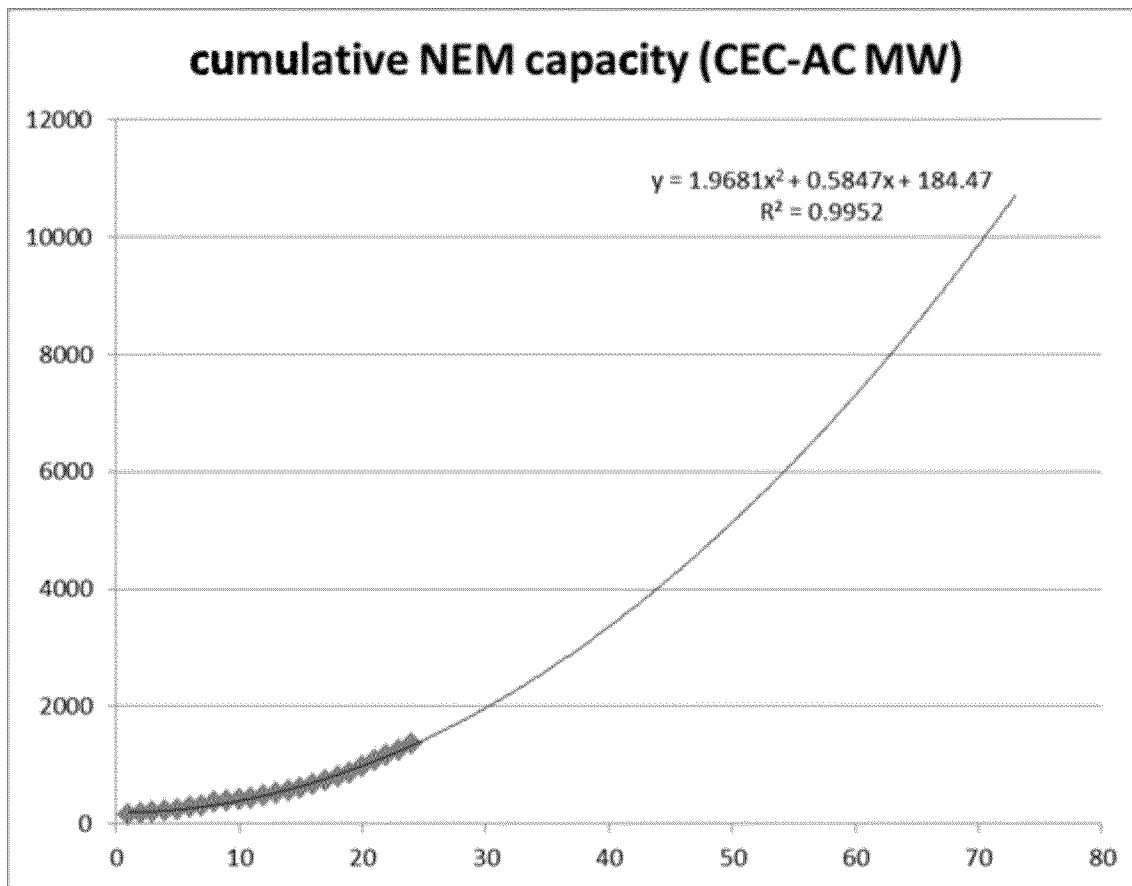
UCS/Sierra Club have no comments at this time.

- 9. Is the forecast of incremental small PV (beyond what is embedded within the IEPR forecast) on the demand side reasonable? If not, please provide an alternate forecast and justification from a public data source as needed.**

UCS/Sierra Club do not believe that the “low incremental PV” assumption added to the demand-side assumptions in several scenarios is large enough to provide a meaningful enough difference between scenarios. UCS/Sierra Club believe this additional demand-side PV assumption should be larger to better reflect the existing growth trends in solar.

Using data from the Table 7 of the 2012 CSI Progress Report, behind-the-meter PV growth is plotted for each quarter beginning in January 2007.²⁴ The y-axis represents total MW of behind-the-meter PV in the IOUs’ combined service territories. Each unit of the x-axis is a quarter-year beginning January 1, 2007.

²⁴ <http://www.cpuc.ca.gov/NR/rdonlyres/9E3141E2-8A8B-4AB9-970D-C2C866F6F8FE/0/CSIDataAnnexAnnual2012.pdf>



The graph above projects PV deployment through 2027. By 2024, under the current growth trend, approximately 10,400 MW of PV capacity would be deployed. The mid-demand CEC forecast only estimates 4,970 MW of PV capacity by 2024.²⁵ Therefore the difference in PV assumed by the CEC and the expected amount under current growth trends is 5,430 MW. This difference should be used as the “incremental PV” added to the demand side assumptions in the two TPP studies where a “low incremental PV” addition is currently proposed, as well as in the “High DG” and “Expanded Preferred Resources / 2050 Climate Goals” scenarios. Notably, with the removal of the NEM cap, there is no longer a limit on rooftop PV deployment in California so higher penetration levels can be assumed. In addition, deployment of this level of

²⁵ CEC, California Energy Demand 2014-2024 Final Forecast, Vol. 1: Statewide Electricity Demand, End-User Natural Gas Demand, and Energy Efficiency (Dec. 2013) at 39 n. 28.

PV is well under E3's 15,000 MW estimate of the local distributed PV that could be installed without reaching the 100% minimum load interconnection screen.²⁶

- 10. Is the forecast of incremental CHP on the demand side and the supply side reasonable for the scenarios that include those forecasts? If not, please provide an alternate forecast and justification from a public data source as needed.**

Sierra Club has no comments at this time. UCS responds to this question in a separate filing.

CONCLUSION

UCS and Sierra Club respectfully request that the foregoing recommendations be adopted.

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Respectfully submitted,

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²⁶ E3, Technical Potential for Local Distributed Photovoltaics in California, Preliminary Assessment (Mar. 2012) at 6.

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