Docket No.: R.20-11-003
Exhibit No.: UCS–01
Witness: Mark Specht
Commissioner: Marybel Batjer
ALJ: Brian Stevens

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Establish Policies, Processes, and Rules to Ensure Reliable Electric Service in California in the Event of an Extreme Weather Event in 2021.	Rulemaking 20-11-003 Filed November 19, 2020

PREPARED OPENING TESTIMONY OF MARK SPECHT

ON BEHALF OF THE UNION OF CONCERNED SCIENTISTS

SEPTEMBER 1, 2021

TABLE OF CONTENTS

LIST OF EXHIBITS

I. SUMMARY OF TESTIMONY AND FINDINGS

Q. What are your main recommendations in this testimony?

A. The main recommendations in this testimony are as follows:

(1) The Draft California Energy Commission ("CEC") Preliminary 2022 Summer Supply Stack Analysis ("Draft CEC Stack Analysis") should not be used as the basis for additional procurement requirements for Summer 2022.

(2) Probabilistic modeling should be conducted to determine the need (if any) for additional procurement.

(3) Future need analyses should use updated input assumptions regarding Redondo Beach Generating Station, import levels, and new resource additions.

II. INTRODUCTION

Q. Please state your name, occupation, and business address.

A. My name is Mark Specht. I am a Senior Energy Analyst at the Union of Concerned Scientists ("UCS"). My business address is 500 12th Street, Suite 340, Oakland, CA, 94607.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of UCS.

Q. Please summarize your professional and educational background.

A. I am a Senior Energy Analyst at UCS, where I have worked for the past three years. The focus of my work at UCS is to generate new research and policy solutions for integrating renewable energy onto the grid while scaling down reliance on fossil fuels. I have engaged extensively in several California Public Utilities Commission ("CPUC") proceedings (including the Integrated Resource Planning ("IRP") proceeding and the Resource Adequacy ("RA") proceeding). I have also conducted several original analyses while at UCS, including analyses that use grid modeling tools.

Prior to joining UCS, I worked for two years at Ascend Analytics, which provides grid modeling software and analytical support to energy companies. My primary responsibility at Ascend Analytics was to provide analytical support to a few municipally owned utilities in California in their use of the PowerSimm grid modeling software.

I have a Bachelor of Arts in integrated science and science in human culture from Northwestern University, and a Master of Arts in philosophy from the University of Otago in New Zealand.

For additional information on my work experience and educational background, my resume is attached as Exhibit A.

Q. What is the purpose of this testimony?

A. This testimony is focused solely on the Draft CEC Stack Analysis.[1] The purpose of the testimony is to interpret the Draft CEC Stack Analysis, provide commentary on its shortcomings, and discuss its implications.

I will also provide suggestions for the type of analysis that should be done to establish additional procurement requirements (if any) for Summer 2022 and Summer 2023.

III. THE DRAFT CEC STACK ANALYSIS SHOULD NOT BE USED AS THE BASIS FOR ADDITIONAL PROCUREMENT REQUIREMENTS

Q. Please provide a summary of the Draft CEC Stack Analysis and the conclusions therein.

A. The CEC released its Draft Stack Analysis on August 11, 2021 in CEC docket 21-ESR-01. The Draft CEC Stack Analysis examined electricity supply and demand on an hourly basis for the summer of 2022, focusing specifically on the 3-9pm window in July, August, and September. The Draft CEC Stack Analysis sought to quantify the resource shortfall under a 15% PRM (called the "average weather" scenario) and a 22.5% PRM (called the "extreme weather" scenario). The analysis found that, under a 15% PRM, a supply shortage occurs only in September, with a maximum shortfall of 1,897 MW. The

[1] CEC, *Draft CEC Preliminary 2022 Summer Supply Stack Analysis* (August 11, 2021). Available at: https://efiling.energy.ca.gov/GetDocument.aspx?tn=239251&DocumentContentId=72701

analysis also found that, under a 22.5% PRM, supply shortages occur in all three months, with the highest shortfall occurring in September and topping out at 5,274 MW.

Q. What concerns do you have with the overall analytical approach used in the Draft CEC Stack Analysis?

A. My main concern is with the type of analysis that was conducted: a deterministic stack analysis. This snapshot of supply and demand conditions provides very little information about the *likelihood* of a supply shortfall.

The central goal of system reliability planning is to reduce the risk of a supply shortage down to an acceptable level. The Loss of Load Expectation ("LOLE") standard of 0.1 days per year is commonly used as the "acceptable level," and the 0.1 LOLE standard has emerged as the industry standard.[2]

Since the Draft CEC Stack Analysis is entirely deterministic, this analysis provides little insight into whether the CAISO grid meets the 0.1 LOLE standard in Summer 2022. As a result, the Draft CEC Stack Analysis does not answer the question it purports to answer: whether additional procurement is necessary to achieve reliability goals in Summer 2022.

Q. In your opinion, what is the problem with using PRMs to develop the conclusions in the Draft CEC Stack Analysis?

A. The Draft CEC Stack Analysis examines two planning reserve margins (15% and 22.5%), but those PRMs are not directly tied to reliability standards, such as the 0.1 LOLE standard. When explicitly tied to a specific reliability standard, a PRM can be a useful proxy for achieving that standard; however, because there is no clear relationship between the two PRMs and reliability standards, the implications of the Draft CEC Stack Analysis remain unclear.

For many years, the CPUC has used the 15% PRM to develop the requirements for its Resource Adequacy program. The 15% PRM was originally adopted in Decision 04-01-

[2] *See* The Brattle Group and Astrape Consulting, *Resource Adequacy Requirements: Reliability and Economic Implications*, Appendix A (September 2013). Available at: https://www.ferc.gov/sites/default/files/2020-05/02-07-14-consultant-report.pdf

050, where the 15% PRM was found to be equivalent to a "one day in fifty years" loss of load probability standard in 2006.[3] Recently, concerns have emerged that the 15% PRM may no longer be sufficient to reach the 0.1 LOLE standard, but the CPUC has still not conducted a comprehensive reevaluation of the PRM required to achieve the 0.1 LOLE standard on California's changing grid.

In addition, a 22.5% PRM is likely too high, and could lead to costly over-procurement to achieve an excessively stringent reliability target. The Draft CEC Stack Analysis itself states that the 22.5% PRM accounts for demand variability "equivalent to a greater than a 1-in-10 weather event." This is a strong indication that the 22.5% PRM would reduce LOLE below the 0.1 days per year (or 1 day per 10 years) standard at the expense of ratepayers.

Q. Should the Draft CEC Stack Analysis be used as the basis for additional procurement requirements for Summer 2022?

A. No, the Draft CEC Stack Analysis does not provide enough information to justify additional procurement in time for Summer 2022. Expedited procurement is very costly, and such procurement should only be required if there is a clearly demonstrated need.

The Draft CEC Stack Analysis does provide a warning that the CAISO grid may not meet the 0.1 LOLE standard, but additional probabilistic analysis is required to confirm that.

Q. What type of analysis should be conducted to inform additional procurement requirements (if any) for Summer 2022?

A. The CPUC and/or CEC should conduct probabilistic modeling to assess grid reliability in Summer 2022. Instead of examining a single set of supply and demand assumptions (as was done in the Draft CEC Stack Analysis), probabilistic modeling examines many potential scenarios, stochastically varying supply and demand conditions. By examining a wide array of potential scenarios, one can accurately determine if reliability metrics, such as the 0.1 LOLE standard, will be met.

[3] Decision 04-01-050, pp. 22-3. Available at: https://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/33625.PDF

The CPUC conducts this type of analysis regularly in the IRP proceeding and the RA proceeding, using the SERVM model. In fact, the Commission recently signaled its intention to conduct an LOLE study in the RA proceeding before making further adjustments to the PRM.[4] The CAISO has also conducted this type of analysis in the IRP proceeding, using the PLEXOS model.

Probabilistic modeling is the most accurate analytical approach to determine if and how much additional procurement may be required to meet reliability standards in Summer 2022.

Q. Do you have any recommendations regarding input assumptions that could be used to improve future iterations of the CEC Stack Analysis or probabilistic modeling?

A. Yes, the Draft CEC Stack Analysis included three input assumptions that were likely too conservative and should be reevaluated.

The first assumption was that Redondo Beach Power Plant units 5, 6, and 8 will be retired by the end of 2021, with 834 MW of capacity going offline. However, the Statewide Advisory Committee on Cooling Water Intake Structures approved a report that extends the once-through cooling ("OTC") policy compliance date for Redondo Beach by two years, through December 31, 2023.[5] While the State Water Resources Control Board has not yet voted on the recommendation, it seems likely that an extension of Redondo Beach's OTC policy compliance date will be approved, and any future analysis should explicitly incorporate this possibility.

The second conservative assumption was the import levels used in the Draft CEC Stack Analysis. The analysis assumed imports would be the "average 2015-2020 CAISO RA showings," and the values reflected on the charts appear to be 4,000 MW or less.[6] However, this assumption is far too conservative because both economic and emergency

[4] Decision 21-06-029, p. 19.
[5] State Water Resources Control Board, *2021 Report of the Statewide Advisory Committee on Cooling Water Intake Structures* (March 26, 2021). Available at: https://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/saccwis/docs/saccwis_report.pdf
[6] Draft CEC Stack Analysis, pp. 5-7.

imports (not just RA imports) flow into the CAISO during periods of high demand, and those imports also contribute to reliability. Other regional transmission operators, such as ISO New England and PJM, explicitly account for the reliability contribution of economic and emergency imports (often referred to as "tie benefits") and reduce their capacity requirements accordingly.[7] The CPUC and the CAISO should also recognize the reliability benefits afforded by economic and emergency imports and adjust future analyses accordingly. This could be achieved by, for example, adjusting assumed import levels upwards to match typical historical import levels during periods of high demand.

The third assumption that deserves further scrutiny is the amount of procurement that will occur between 2021 and 2022. The Draft CEC Stack Analysis includes 840 MW of "CPUC Procurement" by August 2022 and 556 MW of "CPUC Expedited Procurement carry over… from 2021," for a total of 1,390 MW of new resources. On the other hand, the CPUC's recently released list of baseline resources shows over 1,450 MW of energy storage qualifying capacity coming online between January 1, 2021 and August 1, 2022.[8] While some of the storage resources on the CPUC's list are already included on the CAISO's 2021 Net Qualifying Capacity ("NQC") List[9] (and thus are likely being counted as baseline resources in the Draft CEC Stack Analysis), the majority of these storage resources do not appear to be included at all on the CAISO's 2021 NQC List or are included on the "2021 Other" tab (in which case it is unclear if the Draft CEC Stack Analysis includes those resources in the baseline). Since the CPUC's list of baseline resources shows a significant amount of energy storage capacity coming online, not to

[7] *See* ISO New England Inc., *ISO New England Installed Capacity Requirement, Local Sourcing Requirements and Capacity Requirement Values for the System-Wide Capacity Demand Curve for the 2019/20 Capacity Commitment Period* (January 2016) pp. 38-42. Available at: https://www.iso-ne.com/static-assets/documents/2016/01/icr_values_2019_2020_report_final.pdf
See also PJM Interconnection, *The Benefits of the PJM Transmission System* (April 16, 2019) pp. 21-2. Available at: https://www.pjm.com/-/media/library/reports-notices/special-reports/2019/the-benefits-of-the-pjm-transmission-system.pdf
[8] CPUC, *Baseline list of resources as required by D.21-06-035* (August 24, 2021). Available at: https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/d2106035_baseline_gen_list.xlsx
[9] CAISO, *Final Net Qualifying Capacity Report for Compliance Year 2021* (August 24, 2021). Available at: http://www.caiso.com/Documents/NetQualifyingCapacityList-2021.xlsx

mention nearly 600 MW of new wind resources in the same time period,[10] this calls into question whether the Draft CEC Stack Analysis incorporates all the new capacity coming online before summer 2022. Therefore, in my opinion, the assumed level of new resource additions in the Draft CEC Stack Analysis is questionable, and additional examination is needed of the amount of resource additions that will occur between 2021 and 2022. Also, future analyses should be more transparent about the resource additions included in the analysis so that stakeholders can thoroughly scrutinize these assumptions to ensure that new resource additions are not being undercounted.

Q. Does this conclude your testimony?

A. Yes.

[10] The CPUC's baseline list of resources indicates that the following amounts of nameplate capacity will come online between January 1, 2021 and August 1, 2022: 2,003 MW solar, 594 MW wind, 21 MW biomass, 14 MW geothermal, and 5,831 MWh energy storage (which is equivalent to 1,458 MW of qualifying capacity). It is not clear if the Draft CEC Stack Analysis incorporates all of these anticipated resource additions.