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Judge: Kelly A. Hymes
Witness: Stephanie Wang

Clean Coalition
Making Clean Local Energy Accessible Now

OPENING TESTIMONY OF THE CLEAN COALITION REGARDING GOALS FOR DEMAND RESPONSE AND DEMAND RESPONSE AUCTION MECHANISM

May 6, 2014

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I. INTRODUCTION

Pursuant to Assigned Commissioner and Administrative Law Judge's Ruling and Revised Scoping Memo Defining Scope and Schedule for Phase Three, Revising Schedule for Phase Two, and Providing Guidance for Testimony and Hearings, dated April 2, 2014, the Clean Coalition respectfully submits the following testimony of Stephanie Wang, Policy Director of the Clean Coalition, into the record.

First, the Clean Coalition proposes a needs-based approach for developing demand response goals. The purpose is to set goals that can be readily translated into increased reliance on demand response in procurement plans and transmission plans. This approach will allow the Commission to prioritize procurement of the types of demand response in the quantities necessary to meet a large portion of projected local and system needs, such as smoothing out the "Duck" net load curve projected by CAISO.

Second, we recommend that the Commission fully implement the Loading Order mandate to procure all "cost-effective" and "feasibly available" demand response. Since the Commission will soon release a new methodology for evaluating the cost-effectiveness of demand response, the remaining open question is how to define "feasibly available". Our recommended framework for setting demand response goals will also reveal how much demand response will be available to meet operational needs.

The Clean Coalition is a California-based nonprofit organization whose mission is to accelerate the transition to renewable energy and a modern grid. The Clean Coalition drives policy innovation to remove barriers to procurement, interconnection, and realizing the full potential of integrated distributed energy resources, such as distributed generation, advanced inverters, demand response, and energy storage. The Clean Coalition also works with utilities to develop community microgrid projects that demonstrate that local renewables can provide at least 25% of the total electric energy consumed within the distribution grid, while maintaining or improving grid

reliability. The Clean Coalition participates in numerous proceedings in California agencies and before other state and Federal agencies throughout the United States.

II. DEVELOP NEEDS-BASED GOALS FOR DEMAND RESPONSE

The Clean Coalition proposes a needs-based approach for developing demand response goals. This approach can give procurement and transmission planners assurance that the right types and sufficient amounts of DR be available in time to meet a high percentage of projected local and system needs.

Further, by focusing on how each type of demand response can meet operational needs, the Commission can support equal treatment of supply resource and load modifying demand response. This approach can take full advantage of and prevent bias against demand response resources that have very different performance characteristics than fossil generation. Conversely, goals developed independently of projected needs may result in undervaluing of demand response products that can most cost-effectively meet operational needs, and overvaluing of demand response products that have performance characteristics more similar to fossil generation.

Specifically, we recommend that the Commission design "use-cases" that provide details about the local and system needs that demand response can effectively address, and then determine which types of demand response can meet these needs. Goals would be set in relation to needs and based on estimates of potential, and procurement mechanisms would be aligned with such goals.

a. Develop Use-Cases

We recommend development of "use-cases" that provide details about the local and system needs that demand response can effectively address. The use-case approach was

very useful for the Commission's development of the energy storage targets. This approach made it possible for EPRI and DMV KEMA to estimate the cost-effectiveness of different types of storage projects for meeting different types of operational needs, which gave the Commission enough information to set reasonable storage procurement targets.[1] Similarly, different types of demand response can meet a broad range of operational needs in a myriad of different ways.

We recommend that the use-cases focus on projected needs in 2020, especially related to transitioning to higher levels of local and central generation from intermittent, renewable resources. The CEC's 2013 IEPR pointed to the reliability issues raised by the CAISO "Duck" chart about meeting California's 2020 Renewable Portfolio Standard with high levels of intermittent solar generation, and concluded that there is "an urgency to expand DR as a frontline resource for maintaining system reliability and taking full advantage of the contributions of low-carbon renewable generation."[2]

Traditionally, California has primarily used DR for emergencies and peak shaving on hot summer days, and DR goals were framed accordingly. The California Energy Commission's Energy Action Plan and Energy Action Plan II incorporated a statewide DR goal of 5 percent of system peak demand by 2007.[3] Since the reliability concerns of the CAISO have changed, we recommend that the Commission focus on projected needs in 2020 as California approaches its clean energy goals, such as the Renewable Portfolio Standard, electric vehicles, and Zero Net Energy targets.

For illustration, we have outlined a few potential use-cases for projected local and system needs in 2020 as California integrates higher levels of local and remote solar and wind generation.

- Balance Daily Net Load. Smooth out projected seasonal daily net load curve concerns, including those illustrated by the CAISO Duck – avoiding

[1] Commission D.13-10-040
[2] California Energy Commission, *2013 Integrated Energy Policy Report*, at 61
[3] *2013 Independent Energy Policy Report*, at 62

over-generation and reducing both ramp rates and peak demand.

- Contingency Response. Reduce load quickly to provide frequency response and power balancing in the event of the loss transmission lines or central generators.

- Regulation Services: Address minute-to-minute variations in demand and local intermittent generation.

The use-cases should address how operational needs will evolve as California integrates higher levels of distributed resources, including local renewable energy, electric vehicles, and energy storage. These use-cases can also help the Commission and stakeholders work through questions about how demand response will be used by both CAISO and utilities to meet both local and system needs.

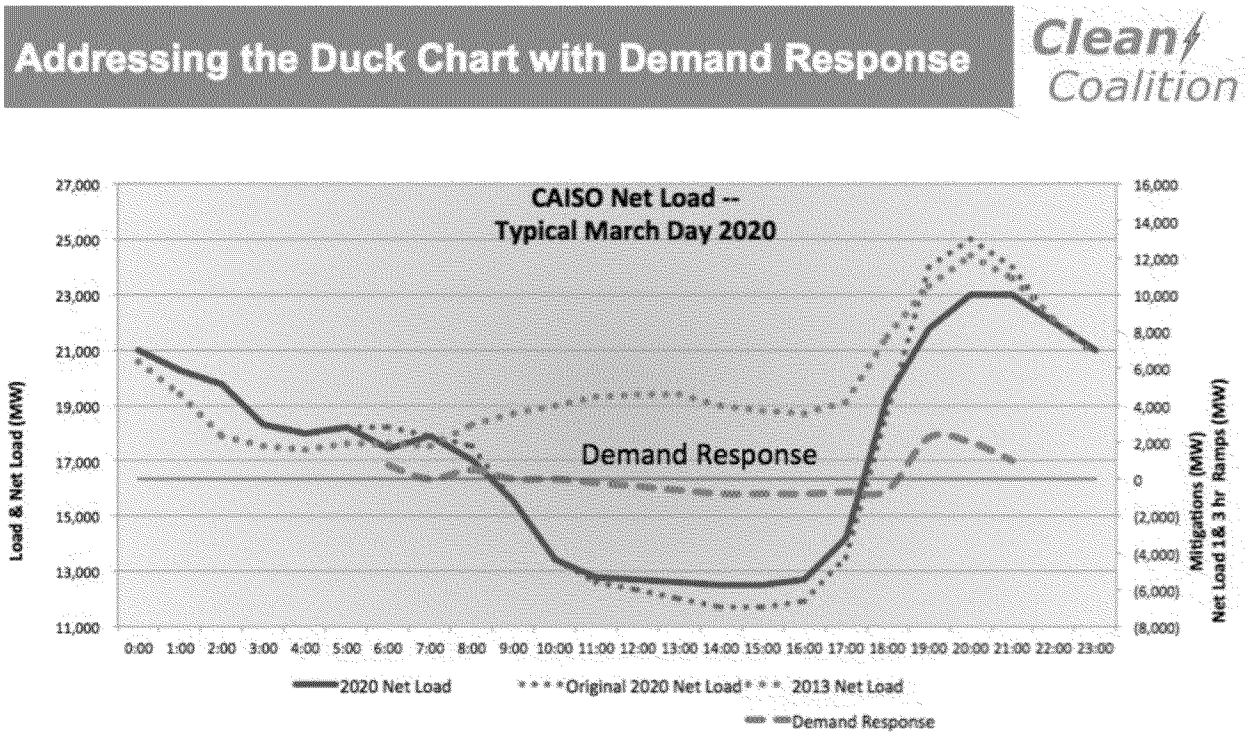
b. Match demand response products to needs

Next, the Commission and stakeholders would identify which types of demand response can address each use-case based on the performance characteristics of each type of demand response. In its proposal for non-conventional alternatives to transmission and conventional generation, CAISO determined that the relevant performance characteristics of a preferred resource are duration, availability and response time.[4] Different or additional criteria may be necessary to evaluate non-dispatchable demand response.

For example, the steep ramps in the CAISO "Duck" curve may be reduced by load modifying demand response that shifts load away from peak periods, towards low-use periods. The remaining ramps can be addressed with supply resource demand response that can provide flexible capacity.

[4] California Independent System Operator, *Consideration of alternatives to transmission or conventional generation to address local needs in the transmission planning process* (September 4, 2013)

The Clean Coalition has developed a model to illustrate how a combination of intelligent grid solutions, including demand response, can reduce CAISO system needs for flexible resources by smoothing out the net load profile.[5] The graphic below shows that demand response programs can incentivize customers to shift power consumption away from high net demand periods (flattening the head and neck of the duck) and towards low net demand periods (lifting the belly of the duck); this is shown by the blue dashed line, which represents demand response in megawatts reflected on the scale to the right. The dotted red line represents the original 2020 net load from the CAISO graphic above, and the solid red line represents the modified 2020 net load curve. For comparison, the dotted orange line represents the 2013 net load curve.



Source: Clean Coalition (2013)

c. Estimate potential of demand response to meet needs

[5] The Clean Coalition's February 2014 presentation to the California Energy Commission on *Flattening the Duck: Facilitating Renewables for the 21st Century Grid* is available at http://www.clean-coalition.org/events/cec-craig-lewis-to-present-flattening-the-duck-chart/

We recommend estimating potential to meet initial goals based on well-designed pilot programs. Long-term goals for demand response should reflect an assessment of the potential availability of each type of demand response that can meet use-case needs, and the projected level of response of each type of demand response. The following would be helpful for making such an assessment.

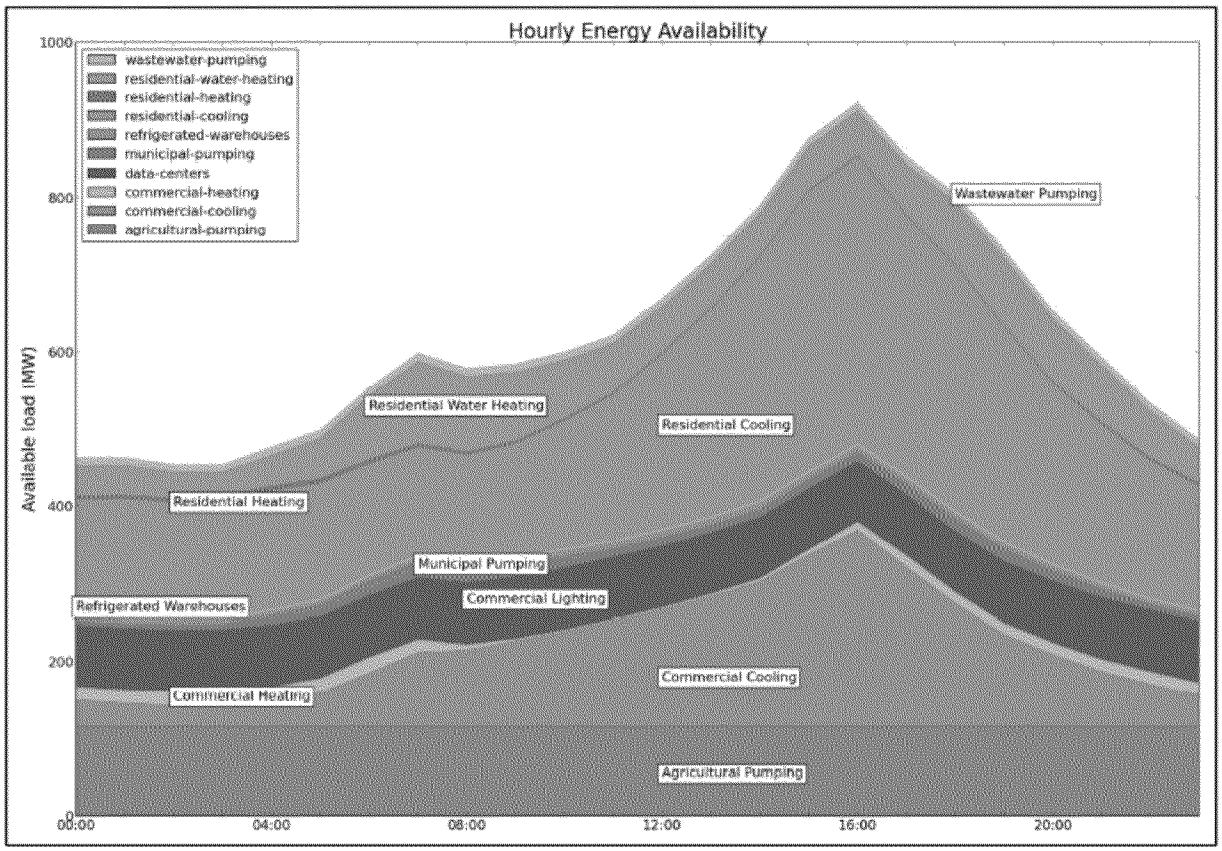
- Study of 2020 projected seasonal customer load profiles that show the hourly capacity of different types of major loads throughout the state.

- Estimates of the potential of specific types of customer loads that would be available to meet use-case needs for a cost-effective payment based on the results of pilot programs.

- Pilot programs designed to assess the potential amount of cost-effective demand response that could be available to meet each use-case. Such pilot programs would offer the highest cost-effective payments, long-term contracts, and reasonable performance constraints.

Seasonal customer load profiles will help the Commission and stakeholders develop estimates of potential that can meet use-case needs. For example, such information can reveal the types and quantities of major customer loads that could be shifted away from the early evening peak (head of the Duck), towards mid-day. The Lawrence Berkeley National Laboratory and the National Renewable Energy Laboratory published a report in 2013 with data on the projected 2020 availability of loads, by type, that will be available to respond to grid services needs on an hour-by-hour basis in the Western Interconnection.[6] The chart below from this study shows projected hourly capacity of different types of major loads in the Western Interconnection in 2020.

[6] Chart from Daniel J. Olsen, et al., *Grid Integration of Aggregated Demand Response, Part 1: Load Availability Profiles and Constraints for the Western Interconnection*, Lawrence Berkeley National Laboratory and National Renewable Energy Laboratory, September 2013, at Appendix E, page 86.



d. Set goals that relate to needs

We recommend setting measurable goals that directly relate to needs shown in the use-cases. For example, goals could be framed in terms of meeting a certain percentage of projected operational needs for each use-case with demand response.

We recommend that the Commission set a floor for procurement of each type of demand response that has significant potential to cost-effectively meet use-case needs. When paired with implementation of the Loading Order as described below, minimum procurement targets can help demand response markets grow sustainably.

e. Align procurement with goals

We expect that needs-based goals include a goal for increasing load modifying demand response that will not be met by existing programs and policies. Neither will the proposed CAISO market opportunities and Demand Response Auction Mechanism promote load modifying demand response.

Accordingly, we recommend consideration of new policies and programs for increasing procurement, use and reliance on load modifying demand response. Such consideration should begin with an exploration of the barriers to the procurement and use of load modifying demand response.

We note that the record does not provide sufficient reasons to assume that load modifying demand response will be less reliable than supply resource demand response for meeting operational needs. If the Commission is concerned about the reliability of load modifying demand response, we recommend further fact finding on this topic.

We also reserve testimony or comments on the potential for better load forecasting tools and methodologies to improve our ability to rely on all types of demand response.

III. IMPLEMENT THE LOADING ORDER

The Loading Order approach to expanding DR continues to have great promise, subject to clarification from the Commission on how to fully implement this mandate. The Loading Order requires procurement of all "cost-effective" and "feasibly available" demand response before renewable and conventional generation. In 2003, the California Public Utilities Commission (CPUC) and California Energy Commission (CEC) signed a joint agency Energy Action Plan that envisioned a "loading order" of preferred energy resources to meet California's energy needs.[7] These preferred resources are cost-

[7] Energy Action Plan, Adopted April 2003 and updated in September 2005

effective energy efficiency and demand response, followed by renewable energy and distributed generation.[8]

The CPUC has emphasized that the Loading Order requires procurement of all "cost-effective" and "feasibly available" preferred resources before fossil fuel procurement, which may be greater than the statutory minimum standards.[9] CPUC D.12-01-033 provides:

> We understand that opportunities to procure additional energy efficiency or demand response resources may be more constrained than just signing up for more conventional fossil generation, but the utilities should still procure additional energy efficiency and demand response resources to the extent they are feasibly available and cost effective. If the utilities can reasonably procure additional energy efficiency and demand response resources, they should do so.[10]

Since the Commission will soon propose a new methodology for evaluating the cost-effectiveness of demand response, this is the ideal time for the Commission to clarify how to fully apply the Loading Order to demand response procurement. One major question to address is how to define "feasibly available." We recommend inclusion of the following concepts: (a) meets needs according to the use-cases, (b) will accept an offer of up to the highest payment amount that would make it still cost-effective, and (c) can be procured through effective programs and processes that provide a level playing field for demand response participation.

The use-case approach for developing demand response goals described above can reveal how much demand response will be available to meet operational needs identified in procurement and transmission planning processes. The Commission can apply the

[8] Id. Page 2. This goal was first articulated in CPUC Decision 03-06-032 in Rulemaking 02-06-001. D.03-06-032 further describes this goal in terms of "% of annual system peak demand" and translated the goal into interim annual megawatt targets for each IOU.
[9] Commission Decision 12-01-033, at 20.
[10] Id, at 20.

estimates of cost-effective demand response potential from the needs-based goals development process to long-term procurement and transmission planning.

We urge the Commission to also clarify how to apply the Loading Order to specific procurements. For example, if a utility requests authorization to procure resources to meet an operational need that a use-case shows that demand response can meet, then the Commission could require a utility to design an all-resource request for offers that provides a level playing field for demand response bids, and then accept all cost-effective bids for demand response before accepting other offers.

IV. SUMMARY OF QUALIFICATIONS FOR STEPHANIE WANG

Q1: What is your name and business address?

A1: My name is Stephanie Wang and my business address is as follows:
16 Palm Ct. Menlo Park, CA 94025.

Q2: What is your job title?

A2: Policy Director, Clean Coalition.

Q3: Please describe your educational background and professional experience.

A3: I have over ten years of policy and legal experience, and I have been a director of the Clean Coalition for over three years. Before joining the Clean Coalition, I advised Pacific Environment on California energy policy. I practiced project development and finance law in San Francisco and New York for about six years. I received my J.D. from the University of Michigan in 2003 and my B.A. from the University of Michigan in 2001.

Q4: Have you been involved in other related proceedings before this Commission?

A4: Yes, I have submitted comments on related proceedings before this Commission, including the Long Term Procurement Plan and Energy Storage.

Q5: Are you willing to be cross-examined in evidentiary hearings?

A5: Yes.

Q6: Is this the end of your testimony?

A6: Yes.