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STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

Application for Certification for the:

**STANTON ENERGY RELIABILITY
CENTER**

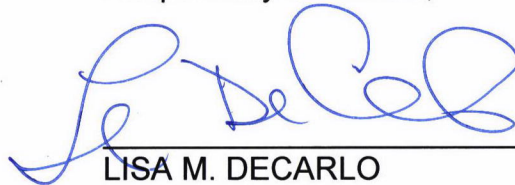
Docket No. 16-AFC-01

ENERGY COMMISSION STAFF'S REBUTTAL TESTIMONY

On June 29, 2018, intervenor Clean Coalition filed opening testimony in the Stanton Energy Reliability Center (SERC) Application for Certification proceeding requesting evaluation of another alternative to the proposed project. Staff has concluded that SERC will not result in any unmitigated significant adverse impacts. In addition, staff produced a robust alternatives analysis to allow a comparison of feasible alternatives. This analysis is sufficient under CEQA and the addition to the analysis of an alternative with questionable feasibility and cost-effectiveness is not warranted. Staff addresses specific assertions made by Clean Coalition in the attached rebuttal testimony. Staff will also make available three additional witnesses in the area of Alternatives for evidentiary hearings: Steve Kerr, David Vidaver, and Matthew Layton. Their resumes and declarations are attached.

DATED: July 6, 2018

Respectfully submitted,



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ENERGY COMMISSION STAFF'S REBUTTAL TESTIMONY ON ALTERNATIVES STANTON ENERGY RELIABILITY CENTER

Testimony of David Vidaver and Matthew Layton

Statements from Clean Coalition's opening testimony are presented in italics, with staff's response following in bold.

- A. *Demand response and energy efficiency are feasible alternatives to a portion of the generation needs and should not be rejected merely because they are "included in planning assumptions when determining new capacity needs and are not achievable alternatives by the applicant."*

Response:

Both demand response (DR) and energy efficiency (EE) were assumed to meet a portion of the reliability needs of the Western Los Angeles (LA) Basin by the California Public Utilities Commission (CPUC) in establishing threshold levels of additional capacity required to meet these needs. The CPUC, in a public stakeholder process, determined that specific, stated amounts of DR and EE could be reasonably assumed to be developed in Western LA Basin over 2015 – 2021, obviating the need for capacity from other sources. The Coalition is effectively arguing that the Energy Commission should either find (a) that the CPUC erred in making the assumptions it did regarding the quantity of DR and EE that could be counted upon to be available to meet reliability needs in the Western LA Basin area, or (b) that the forecasts and assumptions are somehow irrelevant or meaningless. The Coalition argues that "[w]hile some demand response is included in load planning forecasts, this in no way precludes establishing more demand response in addition to baseline assumptions." The amount of DR assumed was the topic of stakeholder discussion at the CPUC and should not be revised in an ad hoc fashion.

In fact, demand response is potentially completely reliable and cost effective. A recent study by the Lawrence Berkeley National Laboratories found that in the Los Angeles Basin area approximately 1,700 MW of demand response opportunity could be potentially obtained at a cost of \$100 per MWh.

Response:

Based on the application submitted to the CPUC by Southern California Edison (SCE) to contract with selected local capacity resources, the Request for Offers (RFO) conducted by SCE yielded less in DR capacity offers than was assumed to be available by the CPUC in establishing authorized levels of procurement of other resources in Western LA Basin. It certainly yielded less than the 1,700 MW of DR that the Coalition posits can be obtained. The Coalition is, in effect,

arguing that that amounts of DR actually obtained in the RFO should be ignored in favor of assertions that much more potentially exists.

B. Solar+storage with advanced inverters are reliable and fully dispatchable.

In addition, Staff is completely mistaken in claiming that distributed solar is not dispatchable. Given the reality of cost-effective co-located storage, storage+solar provides a reliable, dispatchable alternative to natural gas peakers that must be considered as an alternative to every natural gas application. When the engagement was first made between SCE and Stanton's proponent in 2013, renewable generation was not looked at as a reliable resources because the primary sources of fuel--wind and solar--were intermittent, and energy storage and advanced inverters were not in their more advanced stages as they are today. For example, the price of lithium -ion batteries has dropped from about \$1,000 per kilowatt-hour in 2010 to about \$209 per kWh in 2017, while many other battery technologies have shown vast improvements....

These technologies also provide the same frequency regulation and voltage support functions as the proposed SERC project, because both rely on the same advanced inverter functions of the batteries in the SERC proposal.

Response:

Staff agrees that solar+storage is dispatchable. Staff also agrees that the cost of solar+storage has fallen dramatically in the past five years and that solar+storage provides the same frequency regulations and voltage support functions as the Stanton Energy Reliability Center (SERC). Staff cannot comment on the cost-effectiveness (relative to SERC) of solar+storage as staff does not participate in the Procurement Review Groups (PRG), in which non-market participants review responses to RFOs for local capacity resources. Regardless, notwithstanding the very real question of feasibility, the Coalition-proposed alternative is not unlike the 100 percent battery alternative already analyzed by staff. Given that the analysis shows that SERC will not result in any unmitigated significant adverse impacts, further evaluation of yet another possible alternative that on its face does not appear feasible is of questionable value.

To assist the Commission in envisioning what a solar+storage project would look like, the Clean Coalition has modeled an illustrative example of a solar+storage project that could meet the same dispatch characteristics of the SERC operating with a 60% capacity factor (see Attachment 1, "Clean Coalition Opening Testimony Supplement - Stanton Energy Center Solar+Storage Costing model.xlsx"). The 185 MW solar + 100 MW/590 MWH battery system is estimated to have an all-in 30-year cost of \$500 million, significantly lower than the all-in 30-year cost of SERC, which we estimate to exceed \$700 million, including O&M and fuel costs at \$35/MWh. (see Table 1) These costs include supplemental battery

capacity to allow for degradation and as a margin to against depth of discharge. Naturally, should cost assumptions shift, the overall cost would also shift, but under no realistic range of assumptions does the solar+storage alternative appear to be anything other than cost-competitive, if not outright cheaper.

Response:

The proposed SERC project would be permitted at a maximum capacity factor of about 10 to 12 percent. Simple cycle, peaking and ancillary services units like the proposed simple cycle LM 6000 combustion turbine units typically operate closer to a 3 to 5 percent annual capacity factor¹. With the incorporation of the proposed battery energy storage system, total combustion turbine operating hours and number of starts/stops are assumed to be reduced, resulting in a project capacity factor significantly less than statewide simple cycle averages.

However, the Coalition's model uses a 60 percent capacity factor in comparing 30 years cost estimated between SERC and solar+storage. A 60 percent capacity factor would be among the highest capacity factors in the state, exceeding modern highly efficient combined cycle units and approaching base-loaded, must-take, energy-producing units such as the nuclear plants. Assuming a conservative 6 percent capacity factor (still higher than the expected project capacity factor) reduces the cost of SERC by \$486 million to an amount less than half of the cost of the solar+storage project. Appropriate discounting of cost streams, even at a nominal social discount rate of 2or 3percent, would reduce the SERC cost even further.

Solar+storage has a proven and deployed track record of delivering cost-effective energy on a sustained and dispatchable basis. For example, the AES 28 MW of solar and 20 MW / 100 MWh PV solar and storage project on Kauai is delivering power at bundled price of 11 cents per kW, which is cheaper than what the average American currently pay for electricity (U.S. residential electricity prices averaged 12.5 cents/kWh in October 2016).

Response:

What a generator receives for providing wholesale energy and what a residential customer pays for retail energy, which includes not only wholesale power costs, but transmission and distribution charges, public interest charges, taxes, etc., are not comparable.

This Kauai example will also provide for 11% of the total electricity consumption throughout the Island of Kauai starting in 2018. The Kauai Island Utility

¹ Final Staff Assessment (TN223726 page 4.1-111) Greenhouse Gas Table 4 shows local (to SERC) simple cycle units' capacity factors ranging from 0.3 to 4.7 percent, with an average of 1.8 percent c.f. for the units shown. Statewide numbers have a larger range and average from 3 to 5 percent, depending on the year.

Cooperative (KIUC) also signed a contract for 17 megawatts of solar with Tesla Powerpack batteries with 13 megawatts of power and 52 megawatt-hours of energy for 13.9 cents per kilowatt hour. To show how rapidly costs are declining, in June 2018, KIUC announced that a 25-year power purchase agreement with AES for a 19.3MW-solar park paired with a 70 MWh energy storage system for 10.8 cents per kilowatt hour. The recently announced 100 MW solar and 120 MWh

storage for Tucson Electric Power will provide power at a bundled Power Purchase Agreement (PPA) rate of less than 4.5 cents per kWh.

Response:

While staff would contend that anecdotal evidence ignores real differences in costs across projects, e.g. due to geography, constraints on market participation, etc., staff agrees that solar+storage costs have fallen dramatically in the past five years.

III. Southern California Edison does not have the same level of need for this resource given their departing load to the community choice aggregators.

The need for this generation should also be reevaluated based on loss of load in SCE territory from Community Choice Aggregation... Given that Los Angeles is the largest urban area in SCE's service territory, and many of those cities are now expected to join a CCA, the projected peak load for SCE will undoubtedly decrease. Therefore, the 2013 determination of need for Stanton did not factor in the large class of departing load from SCE's generation procurement.

Response:

SERC is being procured as a reliability resource on behalf of all customers in the SCE Transmission Access Charge (TAC) area, not for SCE's customers. As such, the determination of the need for SERC and its services is independent of departing load. Carrying the Coalition's line of argument to its extreme, if all SCE customers joined a CCA, there would be no need for SERC (or a comparable resource) at all. But this cannot be true as loads and reliability service needs in Western LA Basin would be completely unchanged.

Conclusion: "You're not going to get anywhere if you are just adding more and more gas."

California is a state that understands the importance of ceasing carbon emissions to address climate change. SERC is expected to be in service well past 2040, well beyond the time at which California should have ceased fossil fuel generation...

Response:

California’s stated goal at present is not to “cease” carbon emissions, it is to reduce emissions to 20 percent of 1990 levels by 2050. While reducing emissions to zero in the electricity sector is a laudable goal and one that may be realized, it should be noted that this is not necessary to achieve the State’s goals nor is it likely to be the most cost-effective way to do so. In a just-published report commissioned by the Energy Commission, Energy and Environmental Economics, Inc. concludes the following:

[M]odeling suggests that approximately 95 percent zero-carbon generation and 5 percent gas generation is needed by 2050. This generation mix (including both in-state solar and of out-of-state wind to enhance resource diversity), plus aggressive deployment of flexible loads, and energy storage appears to be a lower-cost means to reduce GHG emissions than other, non-electricity sector GHG mitigation options. Achieving a 100 percent zero-carbon generation mix, however, appears to be cost-prohibitive without reliance on nuclear, carbon capture and sequestration (CCS), lower-cost, more abundant biofuels, or new forms of low-cost, long-duration energy storage [“long-duration” meaning for several days].

Deep Decarbonization in a High Renewables Future: Updated Results from the California PATHWAYS Model, Energy and Environmental Economics, Inc., CEC-500-2018-12, June 2018, p.37.

Given the Coalition’s seeming assertion that SERC will operate at a 60 percent capacity factor, staff feels it necessary to restate that the generation and associated emissions of SERC are expected to be very low; with its storage component obviating the need to generate to provide local reliability services, it is all but certain to have a capacity factor well below that of conventional peaking generation dispatched for reliability. As such, its projected contribution to electricity sector emissions in 2050 is consistent with scenarios in which California meets its emission reduction goals.

**DECLARATION OF
DAVE VIDAVER**

I, **Dave Vidaver** declare as follows:

1. I am presently employed by The California Energy Commission in the **Electricity Supply Analysis Division as an Electric Generation System Program Specialist II**
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I assisted in the preparation of the staff testimony on **Rebuttal Testimony on Alternatives** for the **Stanton Energy Reliability Center**. Based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: July 2, 2018

Signed: *Dave Vidaver*

At: Sacramento, CA

Dave Vidaver

Electricity Analysis Office
Energy Assessments Division
California Energy Commission
(916) 654-4656
david.vidaver@energy.ca.gov

Employment (all with the California Energy Commission)

Electric Generation System Program Specialist II, Electricity Analysis Office 2011 – present

Senior analyst responsible for evaluation of procurement, resource adequacy and renewable generation development policies, potential impacts of generation resource development on greenhouse gas emissions.

Electric Generation System Specialist III, Electricity Analysis Office, 2005 - 2011

Supervisor of Procurement and Resource Adequacy Unit, supervise nine staff responsible for evaluating utility procurement and resource adequacy, combined heat and power and distributed generation issues, role of aging and once-through cooled power plants, compiling and maintaining office databases.

Energy Commission Specialist II, Demand Analysis Office, 2005

Monitoring near-term load growth at utility and regional level across the WECC; assessing load-temperature relationships for California and major western utilities and long-term changes in temperatures and load-temperature relationships.

Electric Generation System Specialist II, Electricity Analysis Office 2002 – 2005

Supervisor of Electricity System Modeling Unit; supervised four staff responsible for studies of resource adequacy, market price forecasts, emissions and fuel use studies, assessments of market conditions, role of aging power plants; contributing and principal author of numerous reports, papers, and presentations,

Electric Generation System Specialist I, Electricity Analysis Office, 1998 – 2002

Simulation modeling of WECC for studies of resource adequacy, market price forecasts, emissions and fuel use studies; assessments of market conditions; contributing and principal author of numerous papers, reports and presentations.

Education

BA, Political Science, University of California, Berkeley
MS, Agricultural Economics, University of California, Davis

Additional Information

Member of the Northwest Power and Conservation Council's Generation Resource Committee, which characterizes the cost and performance of generation technologies for studies undertaken in support of the Council's 5-year power plans; numerous reports at conferences and symposia on topics ranging from natural gas demand in California's electricity sector to implementation of resource adequacy measures in California during 2001- 2004; participant in collaborative proceedings with CPUC (resource adequacy, long-term procurement)

**DECLARATION OF
Steven Kerr**

I, Steven Kerr declare as follows:

I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection (STEP) Division, Environmental Protection Office as an Energy Resources Specialist III.

A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

I helped prepare the staff testimony on Alternatives, for the Stanton Energy Reliability Center based on my independent analysis of the Application For Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 7/3/18 Signed: 

At: Sacramento, California



Steven Kerr
Energy Resources Specialist III

Education

California State Polytechnic University, San Luis Obispo, CA
Degree: Bachelor of Science in City and Regional Planning, 2005

Experience

California Energy Commission
2012-Present

Sacramento, CA
Energy Resources Specialist III

- Supervise the preparation of alternatives, environmental justice, land use, and socioeconomics staff analyses.
- Review power plant applications and amendments for alternatives, land use, socioeconomics, land use, transportation, and visual resources environmental impacts.
- Evaluate projects in accordance with CEQA, the California Energy Commission siting regulations, and federal, state and local laws, ordinances, regulations, standards.
- Participate in public workshops and hearings regarding proposals.
- Write environmental analysis documents.

Thomas P. Kerr Inc.
2011-2012

Sacramento, CA
Property Manager

- Management of properties and assets throughout California and Oregon.
- Assist in the preparation of mobile home park closure impact report for Port of San Luis.
- Use various software applications to produce and review billing and financial records.
- Work with local agencies to coordinate infrastructure improvements.

City of Sacramento
Development Services Department
2007-2009

Sacramento, CA
Assistant Planner

- Project manager for various residential, commercial, industrial, and office development projects.
- Assist customers with zoning, design review, preservation, environmental, subdivision code, and sign questions, both at the public counter and by phone/email.
- Provide customers with required entitlement information, fee estimates, and accept applications for proposed development projects.
- Review applications and plans for consistency with city codes, general plan, and applicable community plans, specific plans, and planned unit development guidelines.
- Present projects at community meetings and work with neighborhood association leaders on controversial projects.
- Write staff reports and conditions of approval.
- Present projects at Zoning Administrator, Planning Commission, and City Council public hearings.
- Research development and entitlement histories of parcels.

City of Atascadero
Community Development Department
2005-2006

Atascadero, CA
Planning Intern

- Prepare environmental review documents.
- Review business licenses and building permits.
- Draft letters and staff reports.
- Respond to questions from the public on planning and zoning related issues.
- Access and update information in GIS and Excel.

**DECLARATION OF
MATTHEW S. LAYTON**

I, Matthew S. Layton, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting Transmission and Environmental Protection Division as a Supervising Mechanical Engineer.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I oversaw the preparation of sections of the Rebuttal Testimony on Alternatives for the Stanton Electricity Reliability Center based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: _____

July 3, 2018

Signed: _____

Matthew S. Layton

At: Sacramento, California

MATTHEW S. LAYTON
1516 Ninth Street, MS-40 Sacramento, CA 95814
(916) 654-3868 matthew.layton@energy.ca.gov

Experience Summary

Thirty-five years of experience in the electric power generation field, including regulatory compliance and modification; research and development; licensing of nuclear, coal-fired, peaking and combined cycle natural gas fired power plants; and engineering and policy analysis of regulatory issues.

Education

B.S., Applied Mechanics, University of California, San Diego.

Registered Professional Engineer - Mechanical, California.

Experience

2009-present – Supervising Mechanical Engineer, Engineering Office, Siting, Transmission and Environmental Protection Division, California Energy Commission; managing a multidiscipline program providing engineering and public health assessments of complex energy systems.

1987-2009 – Senior Mechanical Engineer, STEP Division, Energy Commission. Review and evaluate power plant proposals, identify issues and resolutions; coordinate with other agencies; and prepare testimony, in the areas of:

- Air quality resources and potential impacts, and mitigation measures;
- Public Health;
- Soil and Water Resources; and
- Transmission Line Safety and Nuisance.

Prepared Energy Commission demonstration project process; contributed to the Energy Technology Status, Energy Development, and Electricity Reports; Project Manager for demonstration projects; evaluated demonstration test plans, procedures, data and reports; disseminated test results; and managed research and development contracts.

1983-1986 – Control Systems Engineer, Bechtel Power Corporation. Part of a multi-disciplined effort to environmentally qualify client's safety related nuclear plant equipment - performed analyses, calculations and reviews against vendor test reports, NRC guidelines and plant normal and postulated accident conditions.

1981-1983 – Engineer, GA Technologies, Inc. Supervised design and procurement of full-scale test assembly used to evaluate design changes to operating reactor graphite core assembly. Conducted experiment to determine the relationship of graphite oxidation rate to water concentration, temperature, and helium pressure. Environmentally qualified essential and safety related nuclear power plant equipment to comply with NRC guidelines.