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STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:

Application For Certification for the
**STANTON ENERGY RELIABILITY
CENTER**

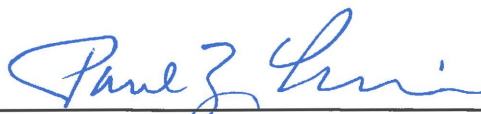
DOCKET NO. 16-AFC-01

**DECLARATION OF PAUL
CUMMINS**

I, Paul Cummins, declare as follows:

1. I am presently employed as Vice President with Wellhead Electric.
2. A copy of my professional qualifications and experience was included with my Opening Testimony and is incorporated by reference in this Declaration.
3. I prepared the previously docketed Opening Testimony and the attached Rebuttal Testimony relating to Alternatives for the Application For Certification for the Stanton Energy Reliability Center (California Energy Commission Docket Number 16-AFC-01).
4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.
5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed at Sacramento on July 5, 2018.



Paul Cummins

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:

Application for Certification for the
**STANTON ENERGY
RELIABILITY CENTER**

DOCKET NO. 16-AFC-01

DECLARATION OF DOUG DAVY

I, Douglas M. Davy, declare as follows:

1. I am presently employed as Program Manager with CH2M HILL Engineers, Inc., a subsidiary of Jacobs Engineering Group Inc.
2. A copy of my professional qualifications and experience was included with my Opening Testimony and is incorporated by reference in this Declaration.
3. I prepared the previously docketed Opening Testimony and the attached Rebuttal testimony relating to Alternatives for the Application for Certification for the Stanton Energy Reliability Center (California Energy Commission Docket Number 16-AFC-01).
4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.
5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed at Providence, Rhode Island on July 5, 2018.



Douglas M. Davy

**STANTON ENERGY RELIABILITY CENTER, LLC
STANTON ENERGY RELIABILITY CENTER
ALTERNATIVES
REBUTTAL TESTIMONY**

I. Name:

Paul Cummins
Doug Davy

II. Purpose:

Our rebuttal testimony addresses the Opening Testimony of Clean Coalition as it relates to the subject of Alternatives to the construction and operation of the Stanton Energy Reliability Center (SERC) as described in the Application For Certification (16-AFC-01).

III. Qualifications:

Paul Cummins: I am currently employed by Wellhead as Vice President and am responsible for leading the development of the SERC. I am a developer of utility scale energy projects with thirty-five (35) years' experience in the utility industry. I have a Bachelor of Science in Mechanical Engineering and a Bachelor of Arts in Economics from the University of Delaware.

Doug Davy: I am presently employed at Jacobs as a Program Manager and have been for the past year. Jacobs acquired CH2M, where I was employed as a Project Manager for 14 years. I have 32 years' experience in providing consulting and permitting services for the siting of electrical generating facilities in California. I have performed or overseen the preparation of Alternatives Analyses for 16 power plant licenses before the California Energy Commission. I have a Doctor of Philosophy degree in Anthropology from Southern Illinois University.

Detailed descriptions of our qualifications are presented in the resumes which are included in Attachment A to our previously docketed Opening Testimony package.

To the best of our knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this

testimony contains opinions, such opinions are our own. We make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, we are sponsoring the exhibits labeled Alternatives and contained on SERC, LLC's Proposed Exhibit List attached to its PreHearing Conference Statement.

V. Opinion and Conclusions

Rebuttal Testimony of Paul Cummins

1. EXECUTIVE SUMMARY OF REBUTTAL

Clean Coalition's Opening Testimony contains numerous flaws, incorrect assumptions, incomplete analysis and misleading presentations. This rebuttal will provide clarifications and corrections to information presented by Clean Coalition. In the light of the enclosed clarifications and corrections, it is clear that the alternatives presented by Clean Coalition are technologically and commercially infeasible and inferior to the Stanton Energy Reliability Center (SERC) in achieving its project objectives.

2. BACKGROUND OF SERC

It is important to understand the background of SERC to properly understand the context and nature of the SERC and its project objectives.

SERC is a unique solution to a unique problem.

The unique problem arose from the imminent closure and retirement of California's Once Through Cooling (OTC) plants and then the sudden, unexpected, early retirement of the San Onofre Nuclear Generating Station (SONGS).

To properly manage the reliability issues that will likely result from the closure of these facilities, the California Public Utilities Commission (CPUC) conducted a Long Term Procurement Plan (LTPP) Proceeding that was originally intended, in part, to solve for the shutdown of the OTC plants. The

original Proceeding was referred to as “Track 1”, and procurement of replacement resources was authorized under Track 1. With the announcement of the closure of SONGS, the CPUC subsequently engaged in Track 4, which authorized SCE to procure additional resources. The resource mix that was approved for procurement has its genesis in the Local Capacity Requirements (LCR) studies that were performed by the CAISO in 2013 in support of CPUC Proceedings. The CAISO LCR studies identified an LCR deficiency in the West LA sub-area (among other sub-areas). The LCR studies identified: a) transmission system weaknesses and b) a voltage collapse problem in the West LA sub-area that had been masked by SONGS. As a result, there is a need for:

- Replacement MWs with DURATION (SONGS had duration), and
- Robust voltage support (SONGS had robust voltage support)

For this reason, a large number of gas-fired, synchronous generating MWs were procured, just shy of 1900 MWs. As a coupling of two Enhanced Gas Turbines (EGT®) with synchronous condensing capability, the SERC provides a unique solution for robust voltage support and DURATION of delivery of MWs when needed. SERC’s ultimate voltage support power factor is 80% whereas a power factor of 95% is typical of inverter-based technologies – higher % power factors mean lower voltage support capability.

In short, the Track 4 LCR procurement was about reliability and capacity products – not the procurement of energy products.

SERC’s Project Objectives reflect that its primary purpose is to address this reliability problem by building and operating a Reliability Project, not an Energy Project. To achieve this Primary Objective, the Project Objectives can be summarized as:

- Safely construct and operate an electrical energy reliability facility to meet Southern California Edison’s (SCE) need for local capacity in the West Los Angeles sub-area of the Los Angeles (LA) Basin local reliability area (LRA) of its service territory;
- Use Wellhead’s patent pending¹ EGT® technology to provide the following:
 - Greenhouse gas (GHG)-free operating reserve,

¹ The patent was pending at the time of filing the AFC but has since been obtained.

- Flexible capacity without start time,
 - Peaking energy for local contingencies,
 - Voltage support and primary frequency response without fuel burn, and
 - Superior transient response attributable to co-location of gas turbines and battery gas turbine management of battery state-of-charge in real time;
- Site the project as near as possible to an SCE substation with available transmission capacity to serve the West LA Basin and minimize the generation tie-line length;
 - Site the project in an existing industrial area on a previously disturbed site to minimize environmental impacts;
 - Site the project in a community that embraces the project and its new technology; and
 - Safely construct and operate an electrical energy reliability project that would satisfy the commercial obligations of both Resource Adequacy Purchase Agreements (RAPA).

It is important to note that while a Project Objective is to use Wellhead's patented EGT® technology, it is because that technology was designed specifically to address the primary purpose of the project to provide superior reliability to address the specific problem identified during the Track 1 and Track 4 proceedings. And as will be discussed in subsequent sections of this testimony, the EGT® technology is already at work in SCE's territory having been procured by SCE for their Center and Grapeland LM6000 generating facilities.

3. DISCUSSION OF FLAWS AND INACCURACIES OF CLEAN COALITION'S PROPOSED ALTERNATIVES

3.1. GENERAL

The Clean Coalition in its presentation of alternatives has failed to provide reasonable and potentially feasible alternatives to SERC in part because Clean Coalition has failed to recognize SERC's capabilities and role in the California grid and specific primary Project Objectives. Specifically:

- Clean Coalition has failed to differentiate that SERC is a provider of capacity and reliability services and is not intended (nor permitted for) high capacity factors.
- SERC is not a facility designed purely for production of low-cost energy as is generally the case for Solar PV. The maximum number of hours that SERC is permitted to operate each year (due to an annual limit in its air permit) is 902 hours - a maximum annual capacity factor of 10.3%. Well below the 60% capacity factor alleged, and unsupported, by Clean Coalition in its Opening Testimony. If SERC was an ordinary peaker, based on my first-hand knowledge of other peakers instructed by CAISO, SERC would be dispatched by the CAISO from 300 to 500 hours annually – annual capacity factors in the range of 3.4% to 5.7%.
- Clean Coalition has improperly characterized SERC as a peaker. SERC is not a peaker. SERC is comprised of two Hybrid EGT®s with synchronous condensing that are able to do things that peakers cannot do. For example:
 - SERC’s EGT®s are able to provide GHG-free spinning reserve. To clarify, SERC is a “no gas burn” provider of spinning reserve. This feature causes the CAISO to park an EGT® at its PMIN of 0 MW and then only ramp the EGT® to its PMAX when there is a system contingency, i.e. an EGT® would be instructed to PMAX to ensure system reliability. As a result, the actual operating hours of EGT®s are substantially less than peakers. SCE’s actual experience with the EGT® conversion of its Center and Grapeland peakers confirms this point.
 - SERC’s EGT®s are net GHG reducers. Because SERC provides GHG-free spinning reserve, CAISO’s dispatch instructions will be altered as a result, and the online gas fleet that is operating at reduced efficiency and reduced power output (at less than PMAX to reserve some portion of each generator’s capacities in order to provide spinning reserves) is re-dispatched to a higher output and higher efficiency and some units are dispatched off. Modeling by ZGlobal demonstrated that SERC’s EGT®s will cause a reduction of system fuel usage, which Atmospheric Dynamics Inc. calculated to represent an annual reduction in GHG of 54,822 tons per year

for the SERC Project, or approximately 27,411 tons per year per EGT®.²

- SERC's EGT@s can provide robust zero gas burn voltage support. SERC's voltage support far exceeds any battery energy storage plant's ability to support voltage. Voltage support capability is expressed for any facility by its power factor (PF) and is an indication of that generator's ability to push voltage up (boost) or pull it down (buck). Inverters available in the market today possess PF capabilities of +/- 0.95. Conversely, the SERC EGT@s possess PF capabilities of boost voltage with a PF of 0.80 and buck with a PF of 0.95, a huge difference from a system operator (CAISO) perspective.
- Clean Coalition fails to recognize the Locational Effectiveness of SERC. Clean Coalition alleges that alternatives at other locations would be just as effective. This is just plain false. CAISO testimony in the CPUC Proceeding for the approval of SCE's proposed 2013 LCR Procurement revealed that SERC had the highest Locational Effectiveness Factor of any proposed project.³
- Clean Coalition fails to recognize the need for DURATION. All of Clean Coalition's proposed alternatives fail to have DURATION beyond several hours per day. Transmission contingencies could span several days. As a result, DURATION is essential, and SERC provides it.

3.2. DEMAND RESPONSE

Clean Coalition's proposed alternatives for Demand Response are not defined and are technologically and commercially infeasible to meet the SERC Project Objectives and therefore it is not reasonable to require them to be carried forward for environmental analysis. Clean Coalition's proposed Demand Response alternative is at best a proposed methodology or suggestion of a class of resource. No clear alternative is proposed that SERC could actually implement.

² Exhibit 83, TN 222124, Table DR10-2

³ Exhibit 99, TN 224081, CPUC Evidentiary Hearing Transcript, Application 14-11-012, May 5, 2015, Volume 1 Page 30, lines 17-23, Testimony of Jesse Bryson.

Clean Coalition references two infeasible and inferior demand response concepts:

- Dispatchable Demand Response. The CAISO does have the ability to dispatch demand response of nominally 321 MWs of slow acting demand response in the LA Basin (per the 2019 Local Capacity Technical Analysis)⁴. This demand response is slow acting because the load must be curtailed within 20 minutes after a dispatch order has been provided by the CAISO. This is helpful in managing peak demand but it is an inferior alternative to SERC. SERC is superior in that:
 - SERC can provide ancillary services because SERC can go from its GHG-free PMIN of 0 MWs to PMAX of 98 MW in ten (10) minutes, much faster and more helpful than the twenty (20) minute response time of slow acting Demand Response. Since slow acting Demand Response is a twenty (20) minute resource, it is incapable of providing ancillary services.
 - SERC can provide active voltage regulation. Unlike SERC's superior ability to provide voltage regulation as discussed previously, Demand Response has no ability to provide any voltage regulation.
 - SERC has duration. SERC can run for days if the CAISO requires it. Demand response cannot exhibit the same duration.
- Voluntary retail customer participation. The programs identified by Clean Coalition are relatively weak load management programs that are implemented by time of use (TOU) rates for SCE's commercial, industrial, and agricultural customers or future billing credits. The TOU rates are supposed to incentivize customers to curtail demand. But these retail customers have no firm obligation to curtail load and so the CAISO has no ability to dispatch these customers to curtail load. In addition, many of these customers will not curtail load, since curtailment is optional/voluntary and their personal or commercial needs of the moment will often outweigh the originally desired rate savings. In addition, SERC, LLC as an independent entity, cannot

⁴ Exhibit 98, TN 224076, page 58.

accomplish such a broad demand response program – the success of such a program requires it to be managed by a utility or an aggregator. All of the load management programs that Clean Coalition references are voluntary, and impossible for SCE to enforce their use as an alternative, let alone SERC. SERC is therefore a superior alternative in that:

- All of the SERC attributes listed above apply, and
- SERC is a participating generator in the CAISO and has mandatory compliance with CAISO's dispatch instructions and is subject to harsh penalties for failure to comply. In short, SERC can be relied upon.

3.3. SOLAR + STORAGE

Clean Coalition's proposal of Solar + Storage as an alternative to SERC is flawed in its essence since Clean Coalition is proposing an energy facility with an absolute and forced production of energy; the Solar PV component, whether ground mounted or rooftop Solar PV, is going to produce energy every day. All of Clean Coalition's cited referenced Solar + Storage projects are energy projects by Clean Coalition's own admission (Clean Coalition states "This Kauai example will also provide for 11% of the total electricity consumption throughout the Island of Kauai starting in 2018.").

This is contrary to the SERC project, which is a reliability and capacity facility with minimal expected energy production, with any minimal energy production dedicated to serving local contingencies and LCR in the West LA basin. Being a reliability and capacity facility is consistent with SERC project objectives. Being an energy facility is not consistent with SERC project objectives.

Clean Coalition's comparative cost analysis of a prospective 185 MW Solar PV + 100 MW/593 MWH facility to SERC is also in error. A summary of Clean Coalition's omissions, modeling errors, inaccurate assumptions, etc. is shown immediately below in "Table 1 – Summary of Modeling Errors and Incorrect Assumptions".

Table 1 – Summary of Modeling Errors and Incorrect Assumptions	
Modeling Error/Incorrect Assumption/Etc.	Effect
<ul style="list-style-type: none"> Assumption of a Capacity Factor for SERC of 60%. SERC's actual expected Capacity Factor is 3.4%. 	<ul style="list-style-type: none"> Overstates the quantity of fuel consumed and hence overstates the cost of fuel attributable to the statement of SERC's total cost.
<ul style="list-style-type: none"> Charging from the grid for 30% of the energy placed in storage. 	<ul style="list-style-type: none"> Minimizes the amount of Solar PV that must be installed. Minimizes the Solar PV CAPEX requirement. The threshold for ITC eligibility is 25% maximum charging from the grid. Clean Coalition's statement of Solar + Storage total cost inappropriately takes a 30% tax credit, leading to \$162,271,500 understatement of cost. Grid charging costs are not identified in the statement of total costs and they should be.
<ul style="list-style-type: none"> Failure to assess a round trip efficiency penalty for charging to Energy Storage 	<ul style="list-style-type: none"> Understates the amount of Solar PV and grid energy that must be placed into storage. Leads to an understatement of Solar PV that must be installed, and an understatement of associated CAPEX. Leads to understatement of grid charging costs.

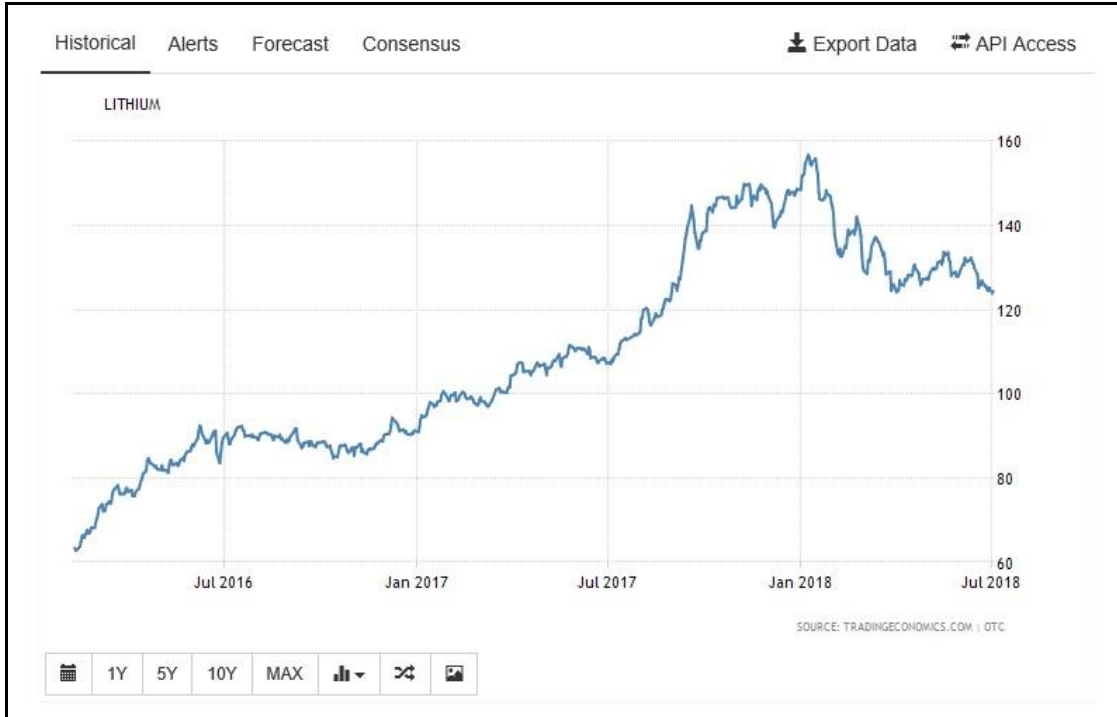
<ul style="list-style-type: none"> Assumption of a 30-year life of SERC. SERC's RA contract is for 20 years and given the public policy direction, it is imprudent to assume commercial viability of SERC after 20 years. 	<ul style="list-style-type: none"> Overstates costs associated with SERC gas consumption and hence an overstatement of SERC's total cost.
<ul style="list-style-type: none"> Failure to include a Solar PV production degradation schedule. No statement of DC overbuild. 	<ul style="list-style-type: none"> One of two effects - Either the model overstates the Solar PV production over time or the initial investment in Solar panels is understated.
<ul style="list-style-type: none"> Use of a 6% per year price decline for future storage augmentation. 	<ul style="list-style-type: none"> A 6% per year decline in storage cost is excessive and unsupportable. Lithium pricing in 2018 is double the price of Lithium in 2015. See Chart 1 – "Historical Lithium Pricing", below. Understates the cost of future augmentations.
<ul style="list-style-type: none"> Augmentation schedule at 10 years. A Storage project with 365 annual cycles will need augmentation on a more frequent basis. Likely after 6 years 	<ul style="list-style-type: none"> Understates the frequency of augmentation and hence an understatement of total costs for the Solar + Storage. In twenty (20) years, three (3) augmentations could be expected, and Clean Coalition only listed two (2).
<ul style="list-style-type: none"> Use of excessively high Solar PV insolation factors. The factors used are those you might see on the highest insolation day of the year. 	<ul style="list-style-type: none"> Overstates the Solar PV production Understates the CAPEX required for the Solar PV Leads to an understatement of Solar + Storage total cost

<ul style="list-style-type: none"> • Failure to use a Net Present Value (NPV) analysis. Clean Coalition showed costs as cumulative total costs over time. While interesting, very few investment decisions are made on that basis, this is especially true for Investor Owned Utilities analyzing products for procurement whose approval is required from the CPUC. A NPV analysis tells investors of their likely return on investment, and conversely tells CPUC commissioners the likely cost to ratepayers. 	<ul style="list-style-type: none"> • Failure to use an NPV analysis tends to inflate the costs. This is particularly troublesome since Clean Coalitions statement of Solar + Storage being cost competitive relied heavily of very large future fuel costs that did not receive NPV treatment.
<ul style="list-style-type: none"> • Land acquisition costs are not shown as a separate cost, but urban land costs are expected to be \$1 million per acre. 	<ul style="list-style-type: none"> • Likely dramatically understates the total cost of Solar + Storage being located in the area of highest Effectiveness Factor in preventing voltage collapse, meeting LCR and local contingencies.

The net result of the above listed omissions, modeling errors, and inaccurate assumptions is an understatement of the cost of Clean Coalition’s proposed Solar + Storage facility and an overstatement of SERC’s cost.

Below is the chart showing historical pricing for Lithium, the main commodity used in most Battery Energy Storage Systems. Growing demand has driven commodity pricing in 2018 to be double that of 2015 pricing. With the rush of global automobile manufacturers toward electric vehicles, it is not assured that storage pricing will see future price declines. As such, Clean Coalition’s assumption of 6% annual price declines year-over-year for each of the next 20 years is too uncertain to be used in the model. We have used 2% annual price decline in our comparative model.

Chart 1 – Historical Lithium Pricing



Re-statement of Comparative Cost of SERC vs. Solar + Storage. In good faith and fairness to Clean Coalition’s proposal of the use of a Solar + Storage alternative, a 20-year, apples-to-apples comparison (Corrected Cost Analysis) of SERC to a Solar + Storage alternative has been created⁵, and the Corrected Cost Analysis reconciles the modeling errors, flawed assumptions, etc. shown in Table 1, above.

The Corrected Cost Analysis uses a 20-year proforma and develops NPVs of each project cost. The Corrected Cost Analysis looked at two operating cases for SERC: 1) annual maximum operations at 12.3% as referenced in the Final Staff Assessment, and 2) operations at 3.4% per SERC’s expectation based on my first-hand knowledge of peaker operations which is also informed by operations knowledge of SCE’s Center and Grapeland EGT®s.

Other inputs to the Corrected Cost Analysis (e.g. Solar MWs) are from a “tuned up” version of Clean Coalition’s “Illustrative Model” which re-sized the Solar PV to have equivalent energy production as SERC’s operating cases described above. Also, charging from the grid was eliminated to improve the purity of the comparison. The results of the Corrected Cost Analysis are

⁵ Exhibit 102

shown in “Table 2 – Corrected Cost Analysis”. Please note that we have corrected the amount of solar generation needed from 185 MWs to 61 MWs to account for SERC’s permitted capacity factor which is well below the 60 percent assumed by Clean Coalition.

Table 2 – Corrected Cost Analysis
Summary of 20-year Cost Comparison of SERC vs. Solar + Storage

	SERC (@ Capacity Factor of 12.3%)	SERC (@ Capacity Factor of 3.4%)	Solar + Storage
	Unrealistic	Realistic	
Capacity, MW (for RA equivalency)	98.0	98.0	98.0
EGT® Nameplate, MW	98.0	98.0	
Solar PV Nameplate, MW			61.0
Storage Nameplate, MW	20.0	20.0	98.0
Storage Nameplate, MWH	8.6	8.6	392.0
Storage Degradation Margin, MWH	0.0	0.0	130.7
Total Storage installed, MWH	8.6	8.6	522.7
CAPEX (Pre-ITC), \$	150,000,000	150,000,000	287,943,333
CAPEX (Post-ITC), \$	150,000,000	150,000,000	201,560,333
NPV10 of O&M Costs, \$	12,429,803	12,429,803	23,625,139
NPV10 of Fuel Cost, \$	31,464,058	8,760,457	0
NPV10 of Augmentation Cost, \$	0	0	38,411,021
Total Costs in Net Present Value, \$	193,893,861	171,190,260	263,596,494

As can be seen, Solar + Storage is not cost competitive with SERC. In the realistic comparison, SERC is \$92.4 million less costly.

Other Issues with Clean Coalition’s proposed Solar + Storage. Besides being commercially inferior, there are other factors which make Clean Coalition’s Solar + Storage proposal technologically inferior and infeasible:

3.3.1 Voltage support

While a Solar + Storage project can provide voltage support, the amount of voltage support that can be provided by SERC is considerably more than a Solar + Storage facility. Less voltage

support is inconsistent with meeting local contingencies, LCR, and SERC's project objectives.

3.3.2 SERC's site's ability to produce energy from Solar PV

Clean Coalition alleges that SERC's approximately 4.5-acre site is capable of producing "on the order of 30 MW by itself." This is an overstatement of the production capacity of ground mounted PV at SERC's site. The site is capable of perhaps 0.65 MW of Solar PV production under the best of conditions. One MW of production requires roughly 6.9 acres per NREL.⁶

3.3.3 Land procurement is infeasible

It is infeasible for SERC to procure 421 acres (18.4 million square feet) for the "equivalent" 61 MW ground mount Solar + 98 MW/522.7 MWH Storage facility devised in Table 2, above⁷. Land cost is roughly \$1 million per acre in the Stanton area. We note that land acquisition costs of \$420 million (or any amount) do not show in Clean Coalition's cost comparison.

3.3.4 Rooftop mounted solar is also infeasible

Additionally, it is unlikely that SERC could line up enough roof tops in the area with the highest Effectiveness Factor and be consistent with SERC's project objectives.

3.4. BATTERY ENERGY STORAGE ALTERNATIVE

A battery energy storage alternative (BESA) is an inferior alternative to SERC. Flaws in Clean Coalition's presentation of the BESA are as follows:

3.4.1 SERC Assists with Duck Curve and Integration of Renewables

Clean Coalition states that "Storage also plays a role in the renewable energy picture that SERC cannot: addressing curtailment and the duck curve". Addressing the duck curve is not in SERC's project objectives because SERC is a reliability and capacity plant. Nevertheless, SERC does assist in managing the duck curve. Unlike peakers which are dispatched by the CAISO to PMIN (generally at 50% of their rated nameplate capacity) for

⁶ Exhibit 97, TN 224077, page v, Table ES-1

⁷ 185 MW proposed by Clean Coalition would require approximately 1,280 acres of land.

Minimum Online Commitment (MOC), SERC's EGT@s provide MOC at its PMIN of 0 MW while also providing GHG-free spinning reserve. As a result, unlike peakers operating at 50% of their nameplate to provide operating reserves to the CAISO, SERC stays out of the way of renewables, and with the EGT@s highly flexible capacity, there is an enhanced ability to integrate more renewables.

3.4.2 BESA provides less voltage support and DURATION.

While a BESA has some very good features, a BESA lacks key characteristic that SERC provides and are necessary project objectives – robust voltage support and DURATION. The SERC voltage regulation capability to a 0.80 power factor is far superior to the BESA voltage regulation to 0.95 power factor. And after 4 hours, the BESA is done, completely discharged – not a good DURATION replacement for SONGS. The BESA is technologically inferior when considering the purpose and characteristics of the SERC.

3.4.3 BESA Cost

Clean Coalition asserts that the BESA is cost competitive with SERC. The tuned up Cost Analysis yields a BESA standalone cost with an NPV of \$231,233,000. This is substantially higher than SERC's NPV of \$171,190,260. This large increment renders a BESA commercially infeasible.

3.4.4 Grid Charging Costs

Clean Coalition says the “batteries do not consume costly fuel”. However, Clean Coalition fails to elaborate on the likely cost of grid charging. It could easily be the case that charging costs exceed revenues received from discharging energy to the grid. This could present an inferior commercial risk with a BESA that is also technologically inferior with respect to meeting voltage support and DURATION requirements. In my opinion that is too much commercial risk for the wrong resource.

4. DEPARTING LOAD

The Clean Coalition contends that SCE does not have the same level of need for SERC given the amount of departing load to community choice

aggregators (CCAs). When the CPUC approved the SERC Resource Adequacy Purchase Agreements, the CPUC also approved the Cost Allocation Mechanism (CAM) for allocation of costs to load serving entities (LSEs) within SCE's service territory. As such, CCAs as LSEs within SCE's service territory will be allocated costs according to the CAM. SCE and its ratepayers will be indifferent and Clean Coalition's point is moot.

5. LACK OF POSSESSION OF DISPATCH RIGHTS BY SCE

Clean Coalition asserts that SCE's projected use of SERC's energy is undermined by the fact that SCE does not possess or control the dispatch rights of SERC, nor does SCE receive any direct energy or ancillary service benefits. Clean Coalition fails to fully comprehend how RA, LCR and CAISO function.

The following points render Clean Coalition's allegation moot:

1. SCE has no projected use for SERC's energy. The LCR deficiency identified by the LTPP Track 4 is purely a capacity and voltage support deficiency, not an energy deficiency. As a result, SCE only procured capacity from SERC and will rely on CAISO and its grid management obligations to procure any needed energy or ancillary services from SERC.
2. The SERC is subject to CAISO dispatch, as are almost all resources. The sole exceptions would be must take resources. SCE wants the CAISO to be responsible for dispatch of the SERC since the CAISO is the grid operator, responsible for grid operation and reliability – not SCE.

Rebuttal Testimony of Doug Davy

For the reasons stated above, I do not believe that the alternatives proposed by Clean Coalition - Demand Response and Solar + Storage – are potentially feasible for CEQA purposes and do not meet the project objectives and therefore should not have been carried forward for environmental analysis. It is important to note that any Alternatives comparison is guided completely by the provisions of CEQA. This comparison is different from the type of comparison of alternatives performed by the CPUC or the CAISO when it is approving utility procurement. That type of comparison was already performed for the SERC as described above and determined SERC to be the best and most feasible

solution for SCE's reliability and local capacity needs among a large number proposed. Any comparison of alternatives for CEQA purposes must focus on the specific environmental impacts of each alternative "project" meeting the project objectives, not each alternative theoretical generation technology.

In addition, I believe that any environmental analysis performed on either the Demand Response or the Solar + Storage alternatives would not be robust and would be highly speculative because these hypothetical alternatives are not defined sufficiently to allow for the specific meaningful evaluation or comparison to the SERC required by CEQA. For example:

- Where would the Solar PV components be installed?
 - As described in testimony above, the SERC site is not nearly large enough to support the amount of Solar PV necessary to match the SERC's capacity.
 - The number and location of specific rooftops proposed for Solar PV in the project area is highly speculative, as the number and location depends on the size of the rooftops; whether they would be commercial, industrial, or residential; and whether they would require costly (and possibly infeasible) re-engineering and restructuring to support the weight of PV panels.
- How far would the Solar PV components be installed from the battery storage site?
 - Would it be necessary to have transmission upgrades to allow the facilities to work together as the SERC facility does and what would be the cost of the necessary upgrades?
- Would any ancillary facilities be needed to support the Solar + Storage facility?
- Which commercial or industrial uses in the area would participate in the Demand Response program?
 - Do they emit air pollutants that would be curtailed during energy curtailment activities and if so, would the facility increase the concentration of its emissions during times of non-energy curtailment to "make-up" for its lost production?
 - Would the curtailment of energy at commercial or industrial facilities promote self-generation from backup generators?
 - Would the curtailment of energy at commercial or industrial facilities increase the risks of emergency response?

Notwithstanding the highly speculative and undefined nature of the alternatives proposed by Clean Coalition, I provide the following hypothetical potential

environmental impacts that may be associated with these hypothetical alternatives.

SOLAR + STORAGE

Assuming either the 185 MW of solar proposed by Clean Coalition, according to the testimony above using the NREL's average of 6.9 acres for 1 MW of ground-mounted solar, Clean Coalition's Solar + Storage Alternative would require approximately 1,280 acres of land. Even if the capacity of the ground-mounted Solar PV were reduced as described above, approximately 421 acres of land would be needed. Even if that land were available in the area, the potential environmental impacts associated with land disturbance alone would be far greater than those for the SERC. These also would be likely to include some of the following impacts, any of which would be greater than those for the SERC, for which are all less than significant:

- Cultural Resources – greater potential for discovery of disturbance of potentially significant archaeological, historic, or Native American resources due to the large amount of land needed and the need to construct maintenance roadways and excavate trenches to convey power to the inverters and on-site substation.
- Biological Resources – greater potential for loss of habitat for special status species, including the potential to encounter listed flora or fauna that would require take authorization. Potentially could include increase bird strikes to special status or migratory birds and may have adverse effects on wetlands and waters of the United States or State of California.
- Air Quality – potentially greater construction-related emissions due to project scale and the large areas that would require ground disturbance and grading.
- Traffic and Transportation – potentially greater number of deliveries of components and construction workforce traffic possibly leading to unacceptable Level of Service degradation.
- Visual Resources – potentially significant glint and glare from the panels and the massing of a large number of panels in a visually sensitive location or viewshed, causing a significant adverse impact.
- Soil and Water Resources – potentially greater drainage related impacts and use of construction water to grade large areas.

If the Solar PV components were installed on rooftops, hundreds or thousands of individual rooftops may be required and the impacts may include greater glint and glare, land use conflicts, and construction traffic. However, it is impossible to

do a meaningful analysis of potential environmental impacts because none of the rooftops have been identified.

DEMAND RESPONSE

The Demand Response Alternative is also not defined with enough specificity to perform a meaningful environmental analysis. However, it is foreseeable that some of the customers that would volunteer for such a program would be commercial or industrial facilities. It is possible that some of these facilities would involve processes that emit air pollutants. It is also possible that, during times of curtailment, such air emissions would be reduced. However, it is equally as likely that, in order to increase production during times when energy is not curtailed, the amount and higher concentration of air emissions could result in increased air quality and public health impacts.

It is also possible that some facilities would resort to backup generation during times of curtailment of energy for emergencies or for normal production, leading to emission of higher levels of criteria pollutants.

If this were the case, such increase in emissions may be greater than those for the SERC which meets current Best Available Control Technology and does not result in significant air quality or public health impacts.