

DOCKETED

Docket Number:	07-AFC-06C
Project Title:	Carlsbad Energy Center - Compliance
TN #:	203987
Document Title:	Alternatives-Rebuttal Testimony of Robert Sarvey
Description:	N/A
Filer:	Robert Sarvey
Organization:	Robert Sarvey
Submitter Role:	Intervenor
Submission Date:	3/27/2015 4:03:37 PM
Docketed Date:	3/27/2015

**BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA**

Petition to Amend
The Carlsbad Energy Center

Docket Number 07-AFC-06C
Exhibit 6002

ALTERNATIVES- REBUTTAL TESTIMONY OF ROBERT SARVEY

Q1 Please state your name and qualifications for the record.

A1 My name is Robert Sarvey and my resume is attached to my testimony.

Q2 What is the purpose of your testimony?

A2 The purpose of my testimony is to rebut certain assumptions made by CEC Staff in their alternatives testimony that leads the CEC Staff to determine that the amended Carlsbad Project is the environmentally superior alternative.

Q3 CEC Staff's testimony concludes that, "*Energy efficiency, demand response, and distributed generation are not viable or feasible alternatives to the amended CECP.*" Do you agree?

A3 No. Energy storage and preferred resources can reduce LCR needs in the SDG&E service territory which can reduce or possibly eliminate the need for the amended CECP. As CEC Staff states "California is rapidly and fundamentally changing its electricity supply system." One of the major changes that has occurred is the emergence of energy storage and preferred resources as a viable and environmentally superior alternative to natural gas fired peakers. SCE recently held an RFO for energy products to meet its Track 1 and Track 4 LCR needs in the LA Basin. SCE received more than 1,800 final offers and, for the first time, a wide range of resource types were evaluated in a head-to-head competition to meet a specific reliability objective. In addition

to five offers with new natural gas generation plants, SCE selected 69 offers from preferred resources and energy storage facilities.¹

*According to SCE, “The competitive solicitation sought not only resources to help enhance the reliability of the power network in specific geographic locations (Los Angeles Basin and Ventura/Santa Barbara), but also to encourage conservation and develop new technologies and innovative solutions to meet identified local electric reliability needs in Southern California. Using energy more wisely, improving energy diversity and increasing flexibility are the keys to maintaining and improving the reliability of Southern California’s grid while incorporating renewables and new technologies,” said Cushnie. “These projects will provide energy solutions to meet the reliability and affordability needs of electricity customers.”*²

SCE signed contracts for 124 MW of energy efficiency with 102.5 MW of energy efficiency coming from the applicant in this proceeding NRG. SCE also signed contracts for 75 MW of demand response all with NRG. SCE signed contracts for 263 MW of energy storage and 44 MW of behind the meter renewable energy for over 500 MW of preferred resources and energy storage all designed to meet SCE’s LCR needs. The breakdown from SCE’s signed contracts from its 2013 RFO is presented in the table below from its application for approval to the CPUC.

¹ <http://newsroom.edison.com/releases/sce-signs-contracts-for-2-221-megawatts-that-could-power-950-000-homes>

² <http://newsroom.edison.com/releases/sce-signs-contracts-for-2-221-megawatts-that-could-power-950-000-homes>

Product Category	Counterparty	Total Contracts	Max Quantity (LCR MW)
Preferred Resources and ES			
EE	<ul style="list-style-type: none"> Onsite Energy Corporation Sterling Analytics LLC NRG Energy Efficiency-L LLC NRG Energy Efficiency-P LLC 	26	124.04
DR	<ul style="list-style-type: none"> NRG Distributed Generation PR LLC NRG Curtailment Solutions LLC 	7	75.00
Renewable DG	<ul style="list-style-type: none"> Solar Star California XXXV, LLC Solar Star California XXXVI, LLC Solar Star California XXXVII, LLC Solar Star California XXXVIII, LLC 	4	37.92
ES	<ul style="list-style-type: none"> AES ES Alamitos, LLC Ice Bear SPV #1, LLC Hybrid-Electric Building Technologies Irvine 1, LLC Hybrid-Electric Building Technologies Irvine 2, LLC Hybrid-Electric Building Technologies West Los Angeles 1, LLC Hybrid-Electric Building Technologies West Los Angeles 2, LLC Stem Energy Southern California, LLC 	23	263.64
Total Preferred Resources and ES		60	500.60
GFG			
GFG	<ul style="list-style-type: none"> AES Alamitos Energy, LLC AES Huntington Beach Energy, LLC Stanton Energy Reliability Center, LLC 	3	1,382.00
Total Preferred Resources, ES, and GFG		63	1,882.60

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In 2014 SDG&E also conducted an all source RFO for products to meet its LCR needs from the closure of SONGS. The results of the RFO are confidential.⁴ The CPUC required SDG&E to submit the results of the 2014 RFO as Exhibit 20C in A.14-07-009. Although the results of the RFO are still confidential the CPUC evaluated the offers from the 2014 RFO and stated in the proposed decision on the Carlsbad PPTA, “Furthermore, SDG&E’s RFO has produced a robust number of offers for preferred resources and energy storage which could potentially meet some, if not all, of the 300 MW to 600 MW of SDG&E’s LCR need that may be procured from any source.”⁵

CEC Staff’s long held position that preferred resources and energy storage are not available in quantities sufficient to replace natural gas fired generation is no longer true. SCE’s

³ Exhibit 6005 A14-11-012 Southern California Edison Company’s Application for approval of the results of its 2013 Local Capacity Requirements Request for offers for the Western Los Angeles Basin. Page 5 of 1

⁴ Exhibit 6007 A.14-07-009 Exhibit 20 SDG&E results of its 2014 RFO (Public Version) Confidential version is only available from SDG&E which requires a non-disclosure agreement

⁵ Exhibit 6004 A. 14-07-009 **DECISION DENYING WITHOUT PREJUDICE SAN DIEGO GAS & ELECTRIC COMPANY’S APPLICATION FOR AUTHORITY TO ENTER INTO PURCHASE POWER TOLLING AGREEMENT WITH CARLSBAD ENERGY CENTER, LLC** Finding of Fact Number 7 page 35 of 37

recent RFO and CPUC application demonstrate that preferred resources and storage can meet the LCR needs created by the retirement of SONGS and OTC units in Sothern California.

Q14 The CEC Staff's Alternatives analysis does not even analyze energy storage as an alternative to the Amended CECP. Shouldn't storage be considered as an alternative to the amended CECP?

A.4 Storage should definitely be considered as an alternative to some and possibly all of the LCR needs in SDG&E's service territory. There were large amounts of energy storage bid into both SCE's and SDG&E's RFO's with SCE filing for approval of 260 MW of storage to meet it LCR needs.⁶ So storage is available to meet LCR needs in the SONGS service area. There are a number of proposed pumped storage projects in the San Diego area also including the LEAPS Project. Storage is actually a better resource for renewable integration than the amended CECP. The amended CECP would take 10 minutes to reach full capacity while energy storage can bring its full capacity online in seconds. The amended CECP has an operating limit of 2,700 hours per year due to air permitting considerations while storage is available year round. Energy storage is superior to the amended CECP because it can absorb energy and the natural gas fired CECP cannot. Energy Storage can solve the problem of over generation that has recently emerged as a grid issue. Even CEC Staff admits, "The long-term solution for over generation is expected to be the development of cost effective, multi-hour storage, allowing the surplus to be stored until it can be used in evening hours."⁷ Multi hour storage is now available as evinced by both SCE's and SDG&E's recent RFO's.

Q5 CEC Staff analyzed a reduced capacity alternative of 400 MW for the amended CECP but, *"Staff eliminated the reduced capacity alternative from further detailed consideration because a smaller plant would not avoid or substantially reduce significant environmental impacts. This alternative could potentially require future expansion or the development of additional capacity at another, possibly undeveloped location in the San Diego region."* Do you agree with that analysis?

A5 No. Carlsbad Energy has recently proposed a reduced capacity alternative of 500 MW in its comments on the Proposed Decision of ALJ Yaknin in A14-07-009.⁸ So it is feasible that this might occur. Staff's testimony suffers from the same assumption that eliminated preferred resources from their alternatives analysis. Staff assumes that the additional 200 MW of LCR resources can only be provided by natural gas fired generation. Under the proposed decision of ALJ Yaknin any LCR needs satisfied by preferred resources or energy storage reduces the need for capacity at the Encina site. Staff's view does not reflect the current realities of the energy

⁶ Exhibit 6005

⁷ FSA Page 171 of 1111

⁸ Exhibit 6008

market as detailed above. Carlsbad Energy could construct 400 MW at the Encina site and the other 200 MW could come from demand response, energy efficiency, or storage. The preferred resources and storage procured from SDG&E's 2014 RFO could necessitate even less than 400 MW of natural gas fired generation at the Encina Site. Staff's conclusion that the reduced capacity alternative would not provide potential benefits in the areas of Air Quality and Public Health are founded in Staff's assumptions that preferred resources and energy storage are not available to reduce LCR needs from the loss of San Onofre and other Southern California OTC units.⁹ Potentially one third or more of the criteria pollutant, TAC, and GHG emissions from the amended CECP could be eliminated by utilizing preferred resources and storage to meet the other 200 MWs of LCR need in the SDG&E service territory.¹⁰ Visual resource impacts at the Encina site would also be reduced.

Staff also testifies that, "Project schedule delays associated with the reduced capacity alternative would reduce its potential feasibility and viability as an alternative to the amended CECP."¹¹ That issue was discussed at the March 18th 2015 pre hearing conference. Dr. Steve Moore from the SDAPCD stated that, "*The way the FDOC is structured, that -- there would not be any problem with them not building two of the units for example, as long as they're building the same units and nothing else has changed.*"¹² Staff stated that, "*If -- if they built four of the six units, I don't think we'd require an amendment to not build the other two, but maybe eventually.*"¹³ Staff's concerns that schedule delays from the reduced capacity alternative would reduce the projects feasibility appear to be minimal or nonexistent as far as the projects permits are concerned.

Q.6 The CEC alternatives testimony eliminates the licensed CECP from consideration for several reasons. One reason is that the licensed CECP, "*While operating in simple cycle mode (while waiting for the steam system to warm up), fast-start combined-cycle units will have efficiencies that are no better than, and are likely worse than, those achieved with advanced simple-cycle turbines such as the GE LMS100.*" Do you agree with that assessment?

A.6 I will note that the CEC is basing its testimony on information supplied by the applicant. The FSA presents no analysis comparing the efficiency of the licensed CECP in "simple cycle mode" to the efficiency of the LMS-100 in its multiple operating scenarios. According to the 2009 CEC Staff FSA, "*The licensed CECP generating system is designed to start and ramp up to 150 MW in ten minutes and operate at an average of 37 percent efficiency during this period.*"¹⁴ Staff does not present an estimate of what the amended CECP's heat rate would be in its first ten minutes of operation so no comparison can be made.

⁹ FSA Page 4.2-21 (213 of 1111)

¹⁰ SCE signed contracts with NRG for 124 MW of energy efficiency from its 2014 RFO.

¹¹ FSA Page 4.2-21 (213 of 1111)

¹² March 18, 2015 pre hearing conference Page 20

¹³ March 18, 2015 pre hearing conference Page 20

¹⁴ 2009 CEC FSA Licensed CECP Page 681 of 838

A better comparison would be the average total heat rate of the licensed CECP over the entire year compared to the average total heat rate of the amended CECP over the entire year. Of course that information is not available since neither plant has been constructed. There is information available on average heat rates for similar units that are currently operating in Southern California. NRG's Walnut Creek Energy Center utilizes 5 LMS-100 turbines in simple cycle mode an almost identical plant to the amended CECP. For 2013 the average heat rate for the Walnut Creek Energy Center was 9.6735 MM/Btu approximately 36 percent efficiency.¹⁵ NRG also owns and operates the new El Segundo Project which utilizes the R2C2 technology (Siemens Rapid Response Combined Cycle technology) proposed for the licensed CECP. The average heat rate for the El Segundo facility for 2013 was 8.2119 MM/Btu. The El Segundo Plant achieved an average heat rate approximately 17 % better than the Walnut Creek Energy Center.¹⁶

Q.7 CEC Staff also eliminates the licensed CECP from consideration in the alternatives analysis because, "such units cannot perform up to four starts per day, as required for the amended CECP project, without substantially shortening the life of the unit. What is your response?"

A.7 CEC Staff when it analyzed the licensed CECP in 2009 stated that, "*The CECP would normally operate in daily cycling duty (plant shut down 8 hours) (CECP 2007a, AFC §2.3.3). In this mode, the CECP would be able to reach full load and operate at a combined cycle efficiency of approximately 48 percent in approximately 45 minutes for a hot start and approximately 125 minutes for a cold start.*"¹⁷ It is likely that the licensed CECP would operate in that manner as that is the way most combined cycles are currently operating. It is highly speculative how a combined cycle project located at the Encina site would operate in the future in the absence of Encina. But CAISO has conducted production simulations one called "**A Case of Local Capacity to Replace OTC Resources**" which simulates the operation of a flexible 373 MW CCGT in SDG&E's service territory in the absence of Encina.¹⁸ The simulation estimated that the flexible 373 MW CCGT would have a capacity factor of 57.1%¹⁹ and would perform an annual average of 19 starts.²⁰

¹⁵ http://www.energyalmanac.ca.gov/electricity/web_qfer/Heat_Rates.php 2013 CEC QFER heat rates.

¹⁶ http://www.energyalmanac.ca.gov/electricity/web_qfer/Heat_Rates.php

¹⁷ 2009 CEC FSA Licensed CECP Page 681 of 838

¹⁸ Exhibit 6009 APPENDIX F California ISO Renewable Integration Study in Support of the California Air Resources Board for Meeting Assembly Bill (AB) 1318 Pages 9-14 of 19

¹⁹ Exhibit 6009 APPENDIX F California ISO Renewable Integration Study in Support of the California Air Resources Board for Meeting Assembly Bill (AB) 1318 Page 10 of 19

²⁰ Exhibit 6009 APPENDIX F California ISO Renewable Integration Study in Support of the California Air Resources Board for Meeting Assembly Bill (AB) 1318 Page 13 of 19

Q.8 CEC staff states in its alternatives testimony that the amended CECP, “*would include many improvements over the licensed CECP, including the elimination of all but one of the overrides in the area of Land Use.*”²¹ What is your response to that?

A.8 Most of the overrides in Land Use would no longer be necessary for the licensed CECP because the City of Carlsbad has modified its Land Use LORS to accommodate the amended CECP. The 35 foot height limitation in the Carlsbad Land Use LORS would still apply to both projects. Staff does not provide a list of improvements that the amended CECP would have over the licensed CECP in their alternatives testimony. Staff only notes that the amended CECP would have a greater potential thermal plume exhaust velocities from the simple-cycle turbine exhaust stacks.²²

Staff’s alternatives testimony does not mention the fact that the licensed CECP would produce approximately 17% less GHG emissions than the amended CECP.²³ Staff’s alternatives analysis doesn’t mention that the licensed CECP would produce 34% less NOx emissions per MWh than the amended CECP.²⁴ Staff’s alternatives analysis doesn’t mention that the licensed CECP would emit 42 % less VOC emissions per MWh than the licensed CECP.²⁵ Staff doesn’t mention that the amended CECP has potential significant visual impacts in its discussion of the elimination of the licensed CECP from consideration on page 4.2-23. Staff’s analysis also fails to include a very important analysis, the comparative costs of the two projects. In May of 2014 CEC issued its Estimated Cost of New Renewable and Fossil Generation in California. The CEC study estimates that an advanced simple cycle facility like the Carlsbad peaker would have a leveled cost of \$460.38 MWh²⁶ while a combined cycle project like the Carlsbad 540

²¹ FSA Page 214 of 1111

²² FSA Page 214 of 1111

²³ FSA Page 159 of 1111

²⁴ FSA Page 137 of 1111

Emissions per MWh for Amended and Licensed CECP (lb/MWh)

Project	NOx	CO	VOC	SOx	PM	NH ₃
Amended CECP	0.096	0.088	0.027	0.006	0.032	0.062
Licensed CECP	0.072	0.208	0.019	0.005	0.037	0.051

²⁵ FSA Page 137 of 1111

²⁶ The estimate of the amended CECP advanced simple cycle cost per MW seems reasonable in this case assuming CEC Staff project capacity factor of 6%. Carlsbad Energy has a 20 year contract with SDG&E for the output of the amended CECP. According to SDG&E’s July 2014 bill insert the capital cost of the PPTA will be 2.6 billion dollars over 20 years. This would amount to an average of 130 million dollars a year in capacity payments. If as CEC staff has estimated the amended CECP has a 6% capacity factor the project will produce 322,700 MW a year approximately. That would mean that each MW produced would have a capital cost of

MW project would have a levelized cost of energy of \$147.74 MWh.²⁷ The cost per MW and the substantial reduction in NOX and VOC emissions provided by the licensed CECP justify its selection as the preferred alternative.

Q.9 Does that conclude your testimony?

A.9 Yes it does.

approximately \$412. The PPTA with SDG&E also requires SDG&E to provide the natural gas so the \$460.38 per MW appears reasonable in this case.

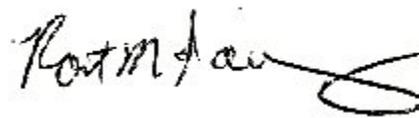
²⁷ <http://www.energy.ca.gov/2014publications/CEC-200-2014-003/CEC-200-2014-003-SD.pdf> Page 145 mid case merchant plant

**DECLARATION OF
Robert Sarvey**

I, **Robert Sarvey**, declare as follows:

1. I prepared the Rebuttal Testimony of Robert Sarvey on Alternatives.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. My testimony is based on my independent analysis of the Petition to Amend, Petition to Remove, the 2012 Commission Decision for the Carlsbad Energy Center Project (CECP), and supplements hereto, the Final Staff Assessment, data from reliable documents and sources, the outcome of A. 14-07-009, and my professional experience and knowledge.
4. I attest to the accuracy of my testimony, and support its conclusions, findings and recommendations hereto.
5. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.
6. 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: March 27, 2015



Robert M. Sarvey

At: Tracy, California

Resume of Robert Sarvey

Academic Background

BA Business Administration California State University Hayward 1975

MBA California State University Hayward 1985

Experience

San Joaquin Valley Air Pollution Control District Citizens Advisory Board Industry

Representative: Analyzed proposed air quality regulations and made recommendations to the Governing Board for approval.

GWF Peaker Plant 01-AFC-16: Participated as an Intervenor in the project and helped negotiate and implement a 1.3 million dollar community benefits program. Successfully negotiated for the use of local emission reduction credits with GWF to offset local air quality impacts.

East Altamont Energy Center 01-AFC-14: Participated as an Intervenor and helped develop the conditions of certification for hazardous materials transportation, air quality, and worker safety and fire protection. Provided testimony for emergency response and air quality issues.

Tesla Power Project 01- AFC-04: Participated as an Intervenor and provided air quality testimony on local land use and air quality impacts. Participated in the development of the air quality mitigation for the project. Provided testimony and briefing which resulted in denial of the PG&E's construction extension request.

Modesto Irrigation District 03-SPEE-01: Participated as Intervenor and helped negotiate a \$300,000 air quality mitigation agreement between MID and the City of Ripon.

Los Esteros: 03-AFC-2 Participated as an Intervenor and also participated in air quality permitting with the BAAQMD. Responsible for lowering the projects permit limit for PM-10 emissions by 20%.

SFERP 4-AFC-01: Participated as an Intervenor and also participated in the FDOC evaluation. My comments to the BAAQM D resulted in the projects PM -10 emission rate to be reduced from 3.0 pounds per hour to 2.5 pounds per hour by the District. Provided testimony on the air quality impacts of the project.

Long Beach Project: Provided the air quality analysis which was the basis for a settlement agreement reducing the projects NOx emissions from 3.5ppm to 2.5ppm.

ATC Explosive Testing at Site 300: Filed challenge to Authority to Construct for a permit to increase explosive testing at Site 300 a DOE facility above Tracy. The permit was to allow the DOE to increase outdoor explosions at the site from 100 pounds per charge to 300 pounds per charge and also grant an increased annual limit on explosions from 1,000 pounds of explosive to 8,000 pounds of explosives per year. Succeeded in getting the ATC revoked.

CPUC Proceeding C. 07-03-006: Negotiated a settlement with PG&E to voluntarily revoke Resolution SU-58 which was the first pipeline safety waiver of GO112-E granted in the State of California. Provided risk assessment information that was critical in the adoption of the Settlement Agreement with PG&E which, amongst other issues, resulted in PG&E agreeing to withdraw its waiver application and agreeing to replace the 36-inch pipeline under the sports park parcel after construction.

East shore Energy Center: 06-AFC-06 Intervened and provided air quality testimony and evidence of cancellation of Eastshore's power purchase agreement with PG&E.

Colusa Generating Station: 06-AFC-9 Participated as air quality consultant for Emerald Farms. Filed challenge to the PSD Permit.

CPUC proceeding 08-07-018: Tesla Generating Station CPCN participated in proceeding which was dismissed due to motion by IEP. Reviewed all filings, filed protest, signed confidentiality agreement and reviewed all confidential testimony.

GWF Tracy Combined Cycle 08-AFC-07: Participated in negotiation of the Air Quality Mitigation Agreement with the San Joaquin Valley Air Pollution Control District and GWF.

CPUC Proceeding 09-09-021: Demonstrated PG&E failed to follow its environmental protocol in the LTPP. Provided testimony and evidence that PG&E's need had fallen since 2007 and that the Commission should limit PG&E's procurement to the 950-1000 MW Range.

CPUC Proceeding A. 09-04-001: Negotiated settlement with PG&E on the construction of the Mariposa Power Plant. Set limits on PG&E procurement which PG&E subsequently violated.

CPUC Proceeding A. 09-10-022: Provided confidential evaluation of PPA value. Provided testimony and evidence that PG&E had violated the Mariposa Settlement. Provided testimony that demonstrated PG&E's demand had fallen sharply since the issuance of D. 07-12-052.

Oakley Generating Station 09-AFC-04 Participated as an intervenor. Provided testimony in Alternatives, Air Quality, Environmental Justice, water quality. Negotiated settlement with CCGS to not use ERC's and instead exclusively use 2.5 million dollars to create real time emission reductions through BAAQMD real time emission reduction programs.

Pio Pico PSD Permit Participated in the Pio Pico PSD permit. Comments resulted in a remand to the air district and a lowering of particulate matter emission limits by 10%

CPUC Proceeding A.11-12-003 Was credited by the decision for demonstrating that an additional 5 MW of firm capacity was not needed from the Thermal Energy Biomass Plant.

CPUC Proceeding A. 12-03-026 Provided testimony and briefing on need for the facility and CAISO Renewable Integration Study.

CPUC Proceeding A. 14-07-009 Provided testimony and briefing on Alternatives, value of PPTA, and need for the Carlsbad PPTA. Reviewed all evidence including the confidential testimony and confidential exhibit 20 C.

