

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

In the Matter of: )  
 )  
Application for Certification for )  
the Carlsbad Energy Center Project )  
Carlsbad Energy Center, LLC )

Docket No. 07-AFC-6

<b>DOCKET</b>	
<b>07-AFC-6</b>	
DATE	JAN 06 2010
RECD.	JAN 06 2010

**PRELIMINARY IDENTIFICATION OF CONTESTED ISSUES**

This filing is in response to the revised Notice of Pre-hearing Conference and Evidentiary Hearings, issued December 21, 2009, for the Carlsbad Energy Center Project. That order instructs the “Staff and other parties [to] file opening testimony, witness lists, and preliminary identification of contested issues” on January 6, 2010.

Staff, of course, has already filed most of its testimony in the form of the Final Staff Assessment (FSA), which also identifies the witnesses for each topic area. Staff is sponsoring additional testimony, attached hereto as **Attachment A-1**, from the California Independent System Operator (CAISO) on the topic of Air Quality (greenhouse gas emissions) and Project Alternatives. Staff will sponsor the CAISO witness at the hearing.

Due to Richard Latteri’s retirement from the agency, Paul Marshal and Mike Conway will testify with regard to the Soil and Water testimony. Mr. Marshall is the supervisor of the unit in which Mr. Latteri once worked, and in which Mr. Conway currently works (Conway Declaration attached hereto as **Attachment A-2**).

Staff will file rebuttal testimony, if needed, on January 14. The issues that are contested will become apparent when intervenors file testimony on January 6. At this time, staff has identified the following issues with regard to testimony filed by the project applicant: (1) whether or to what extent Native American monitors are necessary during project construction (condition **CUL-6**); (2) Staff’s proposed **Worker Safety** requirement that employees be on-site at the power plant; (3) issues in **Land Use** regarding the location of the Coastal Rail Trail. Staff does not currently expect that these issues are of the nature that adjudication will be required to resolve them. Staff may, however, provide clarification comments in

its rebuttal testimony related to the applicant's opening testimony, which it filed on December 15, 2009.

Date: January 6, 2010

Respectfully submitted,

Original signed by: \_\_\_\_\_

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Attachments

**ATTACHMENT A-1**

California Independent System Operator (CAISO) TESTIMONY

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Before the State of California Energy Commission

Carlsbad Energy Center Project  
Docket No. 07-AFC-06

Prepared Testimony of Jim McIntosh, California Independent  
System Operator Corporation

Q1. What is your name?

A1. My name is Jim McIntosh.

Q2. By whom are you employed?

A2. I am employed by the California Independent System Operator Corporation (ISO), located at 151 Blue Ravine Road, Folsom, CA 95630. The ISO is a nonprofit public benefit corporation that operates the electric transmission grid serving over 80 percent of California's electric load for the benefit of California's citizens. My title is Director, Renewable Resource Integration and Grid Architecture.

Q3. Could you please describe your professional background?

A3. I am a professional Electric Grid Operator and I have a B.A. in Business Management from Saint Mary's College. Prior to joining the ISO as the Director of Scheduling in 2000, I worked for Pacific Gas and Electric Company for 29 years in various capacities, mostly in grid operations. I was trained as and became a Journeyman Hydro System, Steam Plant System and Substation Operator before moving into PG&E's Power Control Room in 1975, where I held the positions of Transmission Dispatcher, Scheduler, Generation Dispatcher, Shift Supervisor, Manager of Operations and Director of Grid Outage Coordination and Scheduling. I remain certified by the North American Electric Reliability Corporation (NERC) as a Reliability Coordinator. In my position as Director of Renewable Resource

Integration for the ISO, I focus on integrating renewable resources onto the electricity grid. I am currently the ISO/RTO representative to the NERC Operating Committee and am the past Chair of the NERC Interchange Authority Subcommittee. In addition, I serve as the ISO representative to the WECC Operating Committee and the WECC Operating Committee's representative to the Variable Generation Task Force. I am the past Chair of the WECC Interchange Subcommittee. I am a 30 year member of the American Power Dispatcher's Association.

Q4. What is the purpose of your testimony?

A4. The purpose of my testimony is to describe why the operating and performance characteristics of the proposed Carlsbad Energy Center Project (CECP) will facilitate the reliable integration of increasing levels of renewable resources onto California's electricity grid. The proposed CECP offers one or more operational or performance characteristics that complement the operational and performance characteristics of variable renewable generation that will interconnect to the grid over the next 10 or more years to meet current and anticipated Renewables Portfolio Standard (RPS) targets.

Q5. What are the current RPS targets?

A5. California's current RPS target requires renewable resources to supply 20 percent of energy to California consumers by 2010. The compliance burden falls on retail load serving entities, such as the investor-owned utilities and municipal utilities.

Q6. Are there other anticipated RPS targets?

A6. Yes. In 2005, the California Public Utilities Commission (CPUC) and the California Energy Commission (CEC) adopted the Energy Action Plan II that advocates for a 33 percent RPS target by 2020. The Governor also recently endorsed this goal in Executive Order S-21-09. A 33 percent RPS target is also a critical component of the California Air Resource Board's plan to implement the greenhouse gas emission reduction requirements embodied in Assembly Bill 32.

Q7. Can you briefly describe how much additional renewable generation capacity California needs to achieve the 33 percent RPS target in 2020?

A7. Currently, renewable generation resources, including wind, solar, geothermal, biomass and small hydroelectric comprise over 7,400 MW of installed generation capacity in California. As reported in the CEC's 2009 Integrated Energy Policy Report, the in-state renewable resources, and renewable imports, delivered approximately 32,532 gigawatt hours of energy to California consumers in 2008. These deliveries represented approximately 10.6% of California's total system power, significantly less than the amount of energy from renewables required to meet the 20% RPS target. The current estimate for the amount of energy from renewables that will be needed to achieve the RPS target of 33 percent by 2020 for the State is approximately 103,770 Giga-watt hours. This amount is based on the CEC's "California Energy Demand 2010-2020 Staff Revised Forecast" published in September 2009. The target number for the three large investor owned utilities operating in the ISO's balancing authority area is approximately 87,500 Gigawatt hours. This energy requirement translates into more than 20,000 megawatts of additional renewable generation capacity. Since RPS compliance is based on energy delivered from qualifying renewable resources as a percentage of total energy consumed, the exact amount of needed renewable energy needed will depend on customer load in 2020, and the exact amount of needed renewable capacity will depend on the portfolio of procured renewable resources in that different renewable technologies have different capacity factors.

Q8: Could you please describe the meaning of the phrase *capacity factor*?

A8. The capacity factor of a resource is the ratio of the actual output of the resource over a period of time (typically 1 year) divided by the resource's maximum potential energy production if it operated at full capacity during the entire time period. For example, a resource with a nameplate of 100 Megawatts and an energy production of 262,800 MW-hours per year would have a capacity factor of 30% (262,800 MW-Hrs / (8760 hours per year \* 100 MW)).

Q9. Why, if at all, are renewable resources different from conventional generation from the perspective of operating the electricity grid?

A9. Reliable operation of the power system requires ongoing and constant changes to balance energy supply to meet customer demand and unforeseen outages both on and off peak. The ISO must meet mandatory operating and reliability standards for the bulk power system. These standards require reliable operation for both normal and emergency operating conditions. The ISO must maintain the performance of the bulk power system and also restore the system to a balanced state of power flow, frequency and voltage after disturbances. To this end, the ISO continuously sends dispatch commands to generators to start-up or shut-down or change their energy production to match changes in system conditions. High levels of renewable generation that has variable and uncertain production characteristics, increases the challenge to balance loads and resources and ensure adequate system performance. Variability refers to the fact that the generator's output fluctuates according to the availability of the primary fuel source, i.e., the wind or the sun. Uncertainty refers to the fact that the timing and magnitude of the variability is difficult to predict. Although system operators can handle a certain level of variability and uncertainty, significant increases in variability and uncertainty introduced by renewable resources will impact system performance unless adequate management tools and generation are available all 24 hours of the day.

Q10. What impacts, if any, do variability and uncertainty associated with generation resources create for grid operations?

A10. Although there are many impacts, the fact that fuel for intermittent renewable resources may not be available at the same time as peak electricity demand creates an adverse impact for grid operations. Wind in California generally demonstrates a diurnal and seasonal pattern where peak output occurs on a daily basis in the morning and evening and on a seasonal basis during summer and spring. This inversely correlates to customer load demand, such that wind energy will likely be prevalent during low load periods and exacerbate morning and evening load ramps.

Demand increases sharply in the morning as people wake up and get ready for their day, creating an upward morning ramp, and decreases at night as businesses close and it becomes cooler, creating a downward evening ramp. High levels of wind generation at night when combined with high levels of hydro generation during spring run-off periods have already created over-generation problems in California. Similarly, where wind production rapidly declines while load simultaneously rises in the morning, other generating units must ramp up their energy output to cover the increase in load and decrease in wind generation energy production.

While solar resources correlate better with the ISO's daily demand curve, it may have similar impacts, in that the sunrise and sunset may not temporally correspond with the morning and evening load ramps. Because the aggregate variability of the system will increase at higher levels of intermittent generation, the ramping requirements from conventional or other innovative resources, such as advanced storage devices, must also increase. For example, the nearly instantaneous loss of output from a photovoltaic solar plant resulting from cloud cover will require a quick response from other generating units to rebalance the system.

Q11. What is over-generation?

A11. Over-generation occurs whenever the amount of energy from generation exceeds customer load for a sustained period of time after all efforts have been made to reduce or shut down excess generation. A high level of wind production during the off-peak hours contributes to over-generation when the existing hydro and thermal generating fleet has little flexibility to ramp down. Minimum generation constraints include water management requirements, generators with "must take" status, base loaded plants such as nuclear power, and generators with long startup times that the system needs to operate the next day. The long start-up time units move to their minimum operating levels, so that they will still be available the following morning to meet the morning load pull and peak demand. Over-generation has operational consequences if it persists such that frequency elevates above 60 Hz and the system lacks the ability to quickly arrest frequency decline following a disturbance because

the generators at minimum operating levels have poor governor response. Over-generation is also an economic and regulatory compliance problem because it may require the curtailment or shut-down of renewable generation resources to the detriment of a RPS program. Furthermore, over-generation can drive real time wholesale energy prices to negative values. Negative energy prices mean that generators must pay to stay on-line.

Q12. Has the ISO quantified the projected operational impacts from increased reliance on renewable generation resources?

A12. As I mentioned above, in 2007, the ISO performed an operational analysis that focused on integrating approximately 6,700 MW of wind, including approximately 4,100 MW of new wind capacity in the Tehachapi area.

Q13. What were the results of the ISO's operational analysis?

A13. The 2007 study reached the following conclusions:

- The morning and evening generation ramps are expected to increase depending on the season.
- Regulation capacity and ramping requirements will increase in the "up" and "down" direction depending on the hour and season.
- Load following ramping requirements will increase and require more generation to be available for both upward and downward dispatch.

Q14. Given those results, what did the ISO's report recommend?

A14. There were many recommendations, including the implementation of improved wind forecasts. The ISO report also recommended securing generation resources with increased operating flexibility.

Q15. What types of flexibility or operational characteristics does the ISO need from conventional generating resources to successfully integrate renewable resources?

A15. The ISO's report identified the need for, among other things, generation units with the following capabilities:

- faster ramp rates, both up and down, and wider operating ranges to meet the additional ramp requirements due to wind variability; and
- units with quick start capability so their energy is available to accommodate hour ahead forecasting errors and intra-hour wind variations.

Q16. Are you familiar with the proposed CECP?

A16. Yes, generally. I reviewed the Preliminary Staff Analysis published by the CEC Staff in December 2008 and the Final Staff Analysis published by the CEC Staff in November 2009.

Q17. Can you describe your understanding of the proposed CECP?

A17. As proposed, the CECP would be a combined cycle power plant generating electricity with two gas turbines and two steam turbines operating on heat energy recovered from the gas turbines' exhaust. This configuration allows the power plant to reach full load and operate at a combined cycle efficiency of approximately 55-56 percent in approximately 45 minutes for a hot start and approximately 125 minutes for a cold start.

Q18. Can you please describe regulation service?

A18. Yes. Regulation is an ancillary service provided by generation resources equipped and capable of responding to direct digital control signals from the ISO. Regulation service allows the ISO to control the electrical output of generating units in either an upward or downward direction in order to, among other things, maintain system frequency. This is an important service the ISO uses to continuously rebalance the system and to correct problems created by a sudden loss of output from another generation resource or over-generation conditions.

Q19. Would the proposed CECP have the capability to provide ancillary services such as regulation service?

A19. Yes, the proposed CECP would have this capability. The ISO expects the CECP would participate in the ISO's ancillary services markets and provide regulation service.

Q20. Would the proposed CECP meet some of the flexible characteristics recommended in the ISO report?

A20. Yes, the proposed CECP would have faster operating reserve ramp rates than most of the existing conventional combined cycle generators. As proposed, the CECP would be capable of ramping up and down between approximately 25 and 100 percent of its capacity to support dispatch service in response to demands for electricity or variability of wind production.

Q21. Would the proposed CECP also provide quick start capability as specified in the ISO's 2007 report?

A21. Yes generally. The proposed CECP start-up characteristics are more efficient than a typical combined cycle generating plant. Start-up times are different for different plants and depend on their current equipment temperatures. The start-up times are limited by the heating conditions of the equipment and environmental constraints. A typical one-by-one combined cycle generating unit has a cold start time of 4 to 6 hours. A warm start requires about 5 hours and a hot start requires about 1 to 3.5 hours. As proposed, the CECP plant will be able to start up in less than one-half of the time compared to a typical combined cycle plant. A new combined cycle power plant normally requires 160 minutes or more to reach full load and operates at an average of 30 percent efficiency during this period before finally reaching a combined cycle efficiency of approximately 55 percent at full load.

For additional comparison, units 1 and 2 at the South Bay Power Plant (legacy steam boiler units) take approximately 14 hours to start if the unit has been shut down for 2 or more days. In the event these units are down for 10 hours or less, they

can be restarted in 4 hours. In other words, the earliest the ISO can rely on a South Bay unit after shut down is approximately 4 hours.

Q22. The ISO's report also stated that the installation of large amounts of wind generation would likely exacerbate potential over-generation conditions. How can the CECP help in mitigating potential over-generation conditions?

A22. As proposed, the CECP would include auxiliary equipment such as evaporative inlet air coolers, steam injection power augmentation, and single-pressure heat recovery steam generators to make the plant slightly more efficient than the typical combined cycle power plan. Also, the configuration of two gas turbines and two steam turbines operating on heat energy recovered from the gas turbines' exhaust allows the ISO to shut down half or the whole unit during over-generation conditions.

Q23. Could the ISO shut down the proposed CECP if there were an over-generation condition in the middle of the night and restart it in time to meet load pick-up the next morning?

A23. Yes, if it were operating in the middle of the night, the ISO could shut-down and restart the proposed CECP and it would reach full energy production in approximately 45 minutes. As proposed, the CECP would operate at a combined cycle efficiency of approximately 55 percent once operating.

Q24. If the ISO under-forecasts energy demand or over-estimated wind production, how much time does it take to commit CECP?

A24. The CECP would be able to reach full load and operate at a combined cycle efficiency of approximately 55 percent in approximately 45 minutes for a hot start and approximately 125 minutes for a cold start.

Q25. How will the CECP affect policies to reduce emissions of greenhouse gases (GHGs)?

A25. The ISO has not undertaken an independent analysis of the GHG emissions impacts of the proposed CECP. However, as reflected in my testimony, the proposed CECP's generation characteristics would foster the integration of renewable resources that will displace other less efficient fossil generation.

Q26. What type and quantity of renewable resources are likely to be integrated in the San Diego area?

A26. The ISO anticipates solar and wind resource development in the San Diego area and imports of renewable generation from the Imperial Valley area, including geothermal, solar and wind generation.

Q27. How would the proposed CECP support integration of these resources?

A27. The proposed CECP would provide required dispatchable energy to compliment the variability of energy from not only these resources that are intermittent – solar and wind – but intermittent resources that are added throughout the ISO balancing authority area as California progresses towards its renewable energy goals.

Q28. If roof-top solar is installed throughout the San Diego area, will that eliminate the need for or reduce the value of the proposed CECP?

A28. No. I understand approximately 200 MW of roof-top solar development is already embedded in the current CEC load forecast for San Diego. Rooftop solar, both inside and adjacent to the San Diego area, is non-dispatchable and does not effectively assist in the integration of wind resources – unlike central solar with storage. As such, rooftop solar does not eliminate the need or reduce the value of flexible resources such as the proposed CECP that can ramp up and down and provide regulation services.

**ATTACHMENT A-2**

DECLARATION OF MIKE CONWAY

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**DECLARATION OF**  
Mike Conway

I, Mike Conway, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division as an Engineering Geologist.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I am familiar with, and have reviewed the analysis and preparation of, staff testimony on **Soils & Water** for the Carlsbad Energy Center Project. Therefore, based on the independent analysis of the Application for Certification and associated supplements; based on data from reliable documents and sources; and, based on my professional experience and knowledge: I attest to the accuracy of this testimony, and support its conclusions, finding and recommendations hereto.
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: 1-6-10 Signed: Original signed by M. Conway

At: Sacramento, California

## Resume For: Mike Conway

**Education:** Bachelor of Science in Geology, University of California, Davis, August 2003.  
Master of Science in Geology, California State University, Sacramento, expected 2011

**Certifications:** Certified Professional in Erosion and Sediment Control (CPESC)  
Certified Erosion, Sediment and Storm Water Inspector (CESSWI)  
Leadership in Energy and Environmental Design Accredited Professional (LEED AP)

### Experience:

***Engineering Geologist: California Energy Commission, Sacramento, CA*** **2009**

- Conduct analyses of soil and water resource reports submitted to Commission
- Assess impacts to soil and water resources from construction and operation of energy producing facilities
- Perform onsite evaluations of soil and water resources pre and post-project
- Implement a CEQA-like review of proposed energy projects to evaluate environmental impacts

***Environmental Scientist: Central Valley Water Board, Rancho Cordova, CA*** **2009**

- Wrote municipal storm water permits for Phase I communities in the Central Valley
- Reviewed storm water annual reports for Phase I and II municipalities
- Conducted audits of industrial sites for compliance with storm water permits
- Conducted audits of municipalities for compliance with municipal permits
- Help communities better understand how to effectively implement storm water programs
- Represented Water Board in large technical workshops and other public forums

***Environmental Consultant: Wood Rodgers, Inc., Sacramento, CA*** **2006-2009**

- Consulted clients on how to comply with Federal, State and local storm water quality and environmental regulations
- Helped public and private sector clients gain State Water Resources Control Board (SWRCB) permit coverage under Large and Small MS4 General Permits, NPDES Permits, CWA Section 401 Permits
- Consulted clients on Army Corps of Engineers, 404 Permitting
- Developed a storm water quality manual for Yolo County
- Prepared Caltrans environmental documentation and design for all project phases
- Prepared Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP)
- Drafted water pollution control exhibits using both AutoCAD and MicroStation
- Prepared Caltrans Storm Water Data Reports including cost estimates
- Designed landscaping plans for Caltrans' Modesto Ramp Rehabilitation Project
- Prepared Spill Prevention Control and Countermeasure (SPCC) plans
- Created Hazardous Materials Business Plan for City of Fort Bragg, California
- Prepared proposals for outgoing environmental quality project bids
- Performed field visits to evaluate Best Management Practice (BMP) effectiveness in reducing erosion and sedimentation
- Facilitated multiple storm water quality training workshops for groups up to 20 plus

***Storm Water Quality Consultant: EnviroSafety Services, Elk Grove, CA*** **2004-2006**

- Wrote site specific SWPPPs to include guidance specific to city, county, and geographical constraints
- Designed BMP exhibits using AutoCAD
- Conducted inspections at construction sites throughout the Central Valley for (SWPPP) compliance
- Resolved storm water compliance issues in cooperation with site superintendents, county and city inspectors
- Researched current storm water protection regulations to best protect clients

***Post-Graduate Researcher: Dept. of Land, Air, and Water Resources, U.C. Davis, CA*** **2003**

- Studied the effects of irrigation practices on wetland ecology and water quality
- Independently organized monthly analyses and data processing of selenium contaminated invertebrate, algae, and water samples from the Tulare Lake Drainage District
- Managed concentrated acids, carcinogenic solutions, and final fluorescence measurements
- Compiled research data and presented findings to a team of eight colleagues

***Lab Technician: Raney Geotechnical Laboratory, West Sacramento, CA*** **2001**

- Conducted moisture density, unconfined compression tests, Atterburg Limit, curve, plasticity tests, and basic calculations for soil samples
- Administered load tests on concrete cylinders and mortar samples
- Performed percolation tests and Dynamic Cone Penetrator (DCP) tests in the field and gathered water samples for environmental analysis



**BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT  
COMMISSION OF THE STATE OF CALIFORNIA  
1516 NINTH STREET, SACRAMENTO, CA 95814  
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**APPLICATION FOR CERTIFICATION  
FOR THE CARLSBAD ENERGY  
CENTER PROJECT**

**Docket No. 07-AFC-6  
PROOF OF SERVICE  
(Revised 12/30/2009)**

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**DECLARATION OF SERVICE**

I, April Albright, declare that on January 6, 2010, I served and filed copies of the attached, Preliminary Identification of Contested Issues, dated January 6, 2010. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: [\[http://www.energy.ca.gov/sitingcases/carlsbad/index.html\]](http://www.energy.ca.gov/sitingcases/carlsbad/index.html). The document has been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

**(Check all that Apply)**

**For service to all other parties:**

sent electronically to all email addresses on the Proof of Service list;

by personal delivery or by depositing in the United States mail at Sacramento, California with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses **NOT** marked "email preferred."

**AND**

**For filing with the Energy Commission:**

sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (**preferred method**);

**OR**

depositing in the mail an original and 12 paper copies, as follows:

**CALIFORNIA ENERGY COMMISSION**

Attn: Docket No. 07-AFC-6  
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I declare under penalty of perjury that the foregoing is true and correct.

Original signed by: \_\_\_\_\_  
**April Albright**