

# **Agenda for Staff Workshop: Improving Techniques for Estimating Costs of California Generation Resources**

**MONDAY, May 16, 2011, 9:00 a.m. to 5:00 p.m.  
California Energy Commission  
1516 Ninth Street  
First Floor, Hearing Room A  
Sacramento, California**

<p><b>Participation through WebEx: <a href="https://energy.webex.com">https://energy.webex.com</a> Meeting Number: 928 585 112    Password: CEC@051611 Call-In Number: 1-866-469-3239    Telephone Only: 1-866-229-3239</b></p>
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- 9:00 Challenges to Producing Transparent Cost Estimates for New Power Plants for Electricity Resource Planning Studies – Ivin Rhyne, California Energy Commission**
- 9:15 Overview of Different Levelized Cost of Generation Models and Applications:**
- **California Cost of Generation Model – Joel Klein, California Energy Commission**
  - **Black & Veatch Cost of Generation Calculator – Ryan J. Pletka, Black & Veatch**
  - **Market Price Referent Model – Eric Cutter, Energy + Environmental Economics**
  - **Pro Forma Calculator - Michele Chait, Energy + Environmental Economics**
- 12:00 Lunch**
- 1:00 Continued - Overview of Different Levelized Cost of Generation Models and Applications:**
- **CREST – Jason Gifford, National Renewable Energy Laboratory**
  - **SAM – Nate Blair, National Renewable Energy Laboratory**
  - **Options for Comparing Generation Technologies with Different Operating Attributes – Justin Kubassek, Southern California Edison**
- 3:00 Panel Discussion on Steps to Advance Cost of Generation Models and Update Characterizations of Different Generation Technologies**
- 4:30 Next Steps – Al Alvarado, California Energy Commission**

### **Key Questions for Presentations:**

1. What is the purpose for developing your levelized cost of generation model?
2. Who are the intended end-users of your model and how are they expected to use it?
3. How should your tool not be used in electricity resource planning studies?
4. How is the choice made to use revenue or cash-flow accounting methodologies in calculating levelized costs? If you have only one method, why was this chosen?
5. What generation technologies are included in the model, and why were these technologies selected?
6. What variables are included in your levelized a cost of generation model?
7. Do you add environmental implications and benefits into the levelized cost of electricity calculations?
8. What are the sources of the cost drivers, escalation assumptions and generation characterizations that are used as inputs to your levelized cost of electricity calculations?
9. What is the frequency for updating the modeling inputs information?
10. Are future cost projections included, and if so, what is the basis for these projections and what in-service years are included?
11. What is the relationship between your resulting levelized cost estimates and expected market prices?

### **Questions for the Panel Discussion:**

1. What technology innovations and industry developments are expected to occur that will change future generator development and operating costs?
2. Do you have recommendations on how environmental implications and benefits may be included in levelized cost of electricity calculations?
3. How can the uncertainty of tax credits be captured in a cost of generation model?
4. How should the uncertainties associated with each key input variable (that is, fuel costs, cost of materials, market value of components, etc.) be reflected in a levelized cost evaluation?
5. How can levelized costs be used to derive wholesale market price estimates and the market value of different generator technologies to help investment and procurement decisions (that is, resource adequacy or emergency capacity pricing, time-of-day market value)?
6. Should system integration costs, such as what is needed to firm up intermittent generation technologies to become comparable to a dispatchable resource, be captured in a cost of generation model?

**Links to the cost of generation models that will be discussed at the workshop:**

The Energy Commission Cost of Generation Report can be found at:

<http://www.energy.ca.gov/2009publications/CEC-200-2009-017/CEC-200-2009-017-SF.PDF>

Energy Commission, Cost of Generation Model and User's Guide:

<http://www.energy.ca.gov/2010publications/CEC-200-2010-002/index.html>

Black & Veatch, Cost of Generation Calculator and Manual:

<http://www.energy.ca.gov/reti/documents/index.html>

Energy + Environmental Economics, Market Price Referent Model (No Manual):

<http://www.cpuc.ca.gov/PUC/energy/Renewables/mpr>

Energy + Environmental Economics, Pro Forma Model (No Manual):

[https://www.opendrive.com/folders?4298182033\\_Pj7oE](https://www.opendrive.com/folders?4298182033_Pj7oE)

National Renewable Energy Laboratory, CREST and Manual:

<http://financere.nrel.gov/finance/content/crest-model>

National Renewable Energy Laboratory, SAM (No Manual):

<https://www.nrel.gov/analysis/sam/>