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# **2012 Integrated Energy Policy Report Update Proceeding**

## **Retail Rate and Cost Issues with Renewable Development**

California Energy Commission

May 22, 2012



## Background

- CEC prepares IEPR every two years and update in intervening years
- Governor's Clean Energy Jobs Plan in 2010 directed CEC to prepare renewable plan
- 2011 IEPR laid foundation for plan with 5 high-level strategies to address challenges
- Renewable Strategic Plan to be developed under 2012 IEPR Update



## Renewable Strategic Plan Workshops

- April 12: Evaluating and Capturing Benefits of Renewable Energy
- May 10: Identifying Priority Geographic Areas
- May 14: Minimizing Interconnection Costs/Time
- ***May 22: Retail Rate and Cost Issues***
- May 30: In-state Jobs and Economic Benefits
- June 6: Financing and R&D
- June 11: Minimizing Integration Costs and Requirements



## Strategy 2

Evaluate the cost of renewable energy projects beyond technology costs – including costs associated with integration, permitting, and interconnection – and their impact on retail electricity rates. This evaluation shall be coupled with a value assessment that could potentially lead to monetizing the various system and non-energy benefits attributable to renewable resources and technologies, particularly those benefits that enhance grid stability and reduce environmental and public health costs



## **Today's Agenda**

- Panel 1: Total Cost Estimates, Projections, and Drivers
- Public Comment
- ~ Lunch ~
- Panel 2: Cost Consideration in Procurement and Policies to Reduce Costs
- Presentation: Rate Design to Mitigate Cost Impacts
- Panel 3: Cost Consideration in Rate Design and Policies to Improve Rate Design
- Public Comment



# Renewable Power in California: Status and Issues Report

- Cost challenges to developers
- Cost trends
- Effects of subsidies and tax credits
- R&D efforts

*Full report available at:*

*[www.energy.ca.gov/2011publications/CEC-150-2011-002/CEC-150-2011-002-LCF-REV1.pdf](http://www.energy.ca.gov/2011publications/CEC-150-2011-002/CEC-150-2011-002-LCF-REV1.pdf)*



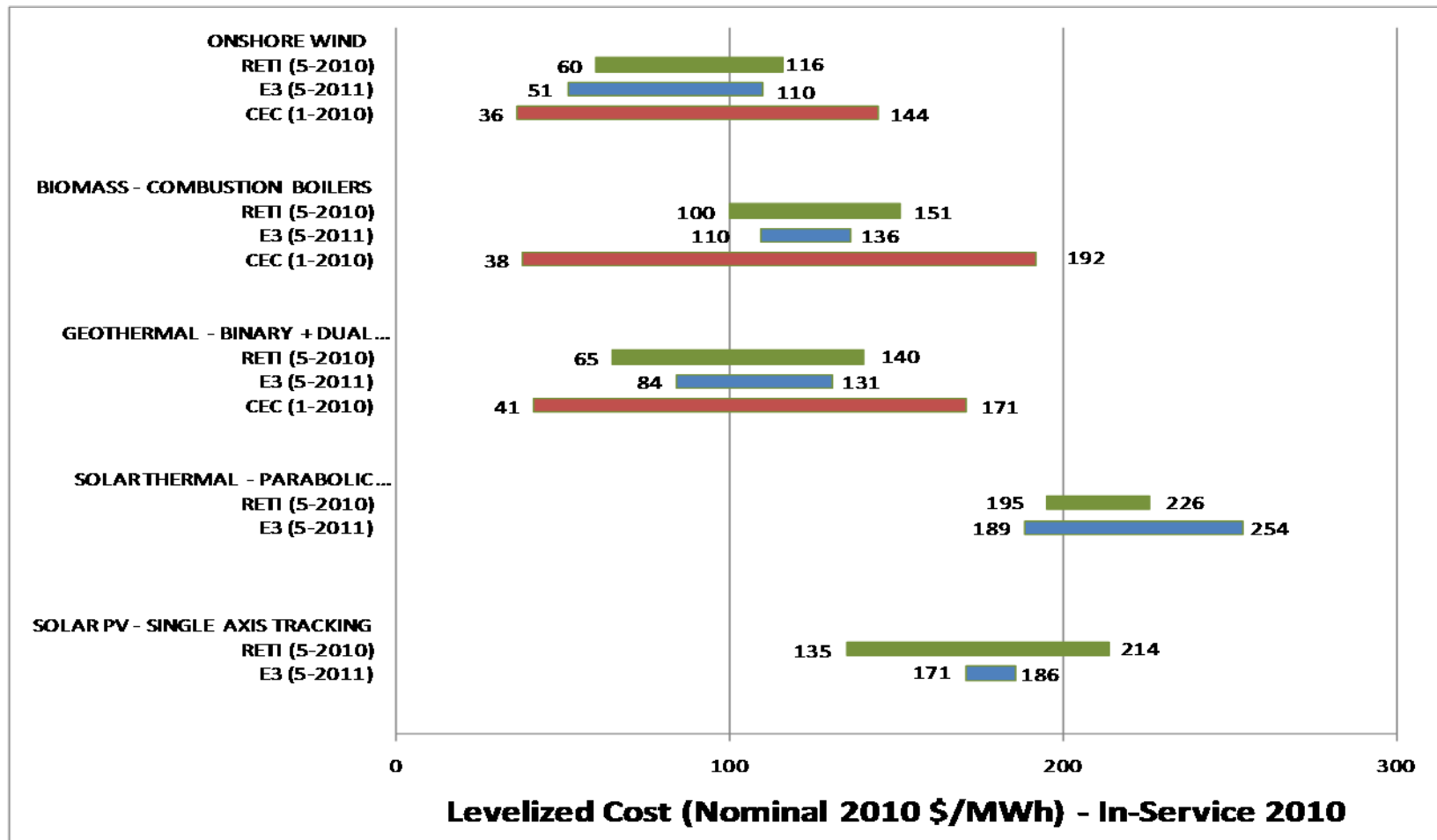


# **Levelized Cost of Energy**

- Fixed cost components – bulk of costs for renewable plants
  - Capital and financing
  - Fixed O&M (primarily labor)
  - Insurance
  - Real estate and corporate taxes
- Variable cost components – bulk of costs for combined cycle natural-gas plant
  - Fuel costs
  - Variable O&M



## Comparison of Levelized Cost Estimates







# Levelized Cost Studies' Limitations

- Do not reflect recent cost reductions
- Do not consider time of delivery payments
- Do not consider transmission/integration costs
- Do not include DG technologies
- Do not reflect technological advances



## **Other Important Cost Factors**

- Environmental review and permitting
  - Delays, overlapping/duplicative processes, legal challenges, mitigation requirements, varying codes, standards, fees
- Transmission/distribution interconnection
  - Time consuming, expensive
- Integration
- Financing and investment



# **Reducing Environmental/ Permitting Costs**

- Renewable Energy Transmission Initiative
  - Identified cost-effective areas for renewable development
- Desert Renewable Energy Conservation Plan
  - Help developers choose sites with minimal environmental impact
- Local governments pre-designating priority sites



# Reducing Interconnection Costs

- RETI, DRECP
- Upsize transmission projects
- Local government coordination with utilities to identify sites near existing infrastructure
- Fast track processes for DG projects
- Use lessons learned from European DG interconnection
- Improvements to interconnection processes



## **Reducing Integration Costs**

- Energy agencies working together to determine costs of transmission and renewable integration
- Support infrastructure to integrate renewables (storage, demand response, natural gas plants)



# **Effect of Tax Benefits on Levelized Cost Estimates**

- Biomass – 29-34% reduction
- Geothermal – 48-50% reduction
- Hydro – 18-51% reduction
- Solar – 53-55% reduction
- Wind – 49% reduction





# Reducing Financing/Investment Challenges

- Tax credits
  - Investment tax credit – 30% of project costs
  - Production tax credit – per kWh, expires 2012 (wind), 2016 (solar)
- Accelerated depreciation
  - Depreciate over 5 yrs, can reduce total PV system cost by 26%
- Property tax exemptions – solar only



## **R&D Investments**

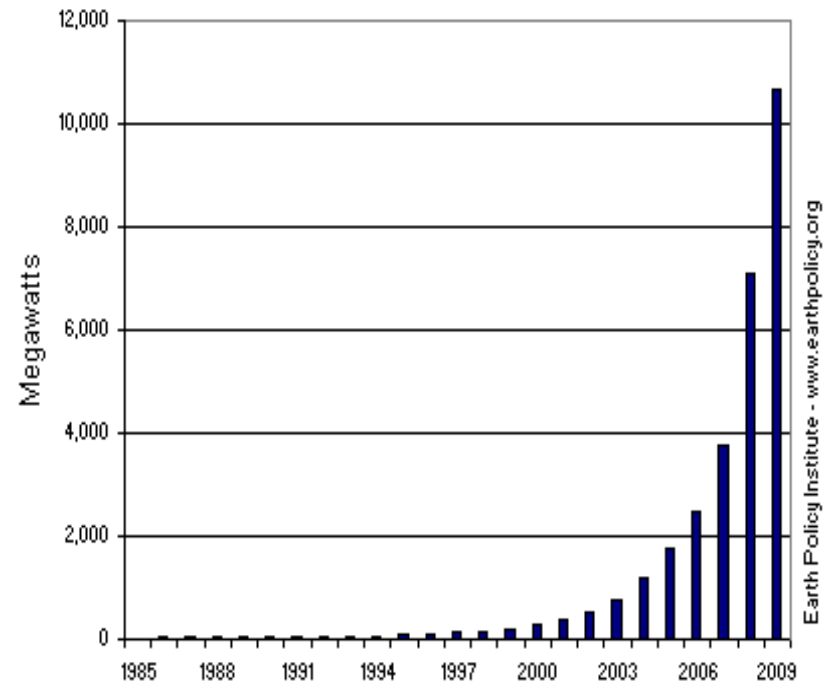
- **PIER Program Investments**
  - GreenVolts, Inc. – concentrating PV system with low installation and manufacturing costs
  - Community Power Corporation – BioMax 50kW modular biopower system
  - Wind Turbine Company – demonstrating cost savings by reducing weight and manufacturing cost for turbine components
  - LLNL/DOE – extraction technology for geothermal waters that produces high purity silica marketable to solar industry and others



# Solar PV Cost Trends

- Dramatic cost reductions in recent years
- Production increases lead to decreased costs.

World Annual Solar Photovoltaics Production,  
1985-2009



Source: EPI from Worldwatch; Prometheus Institute; Greentech Media



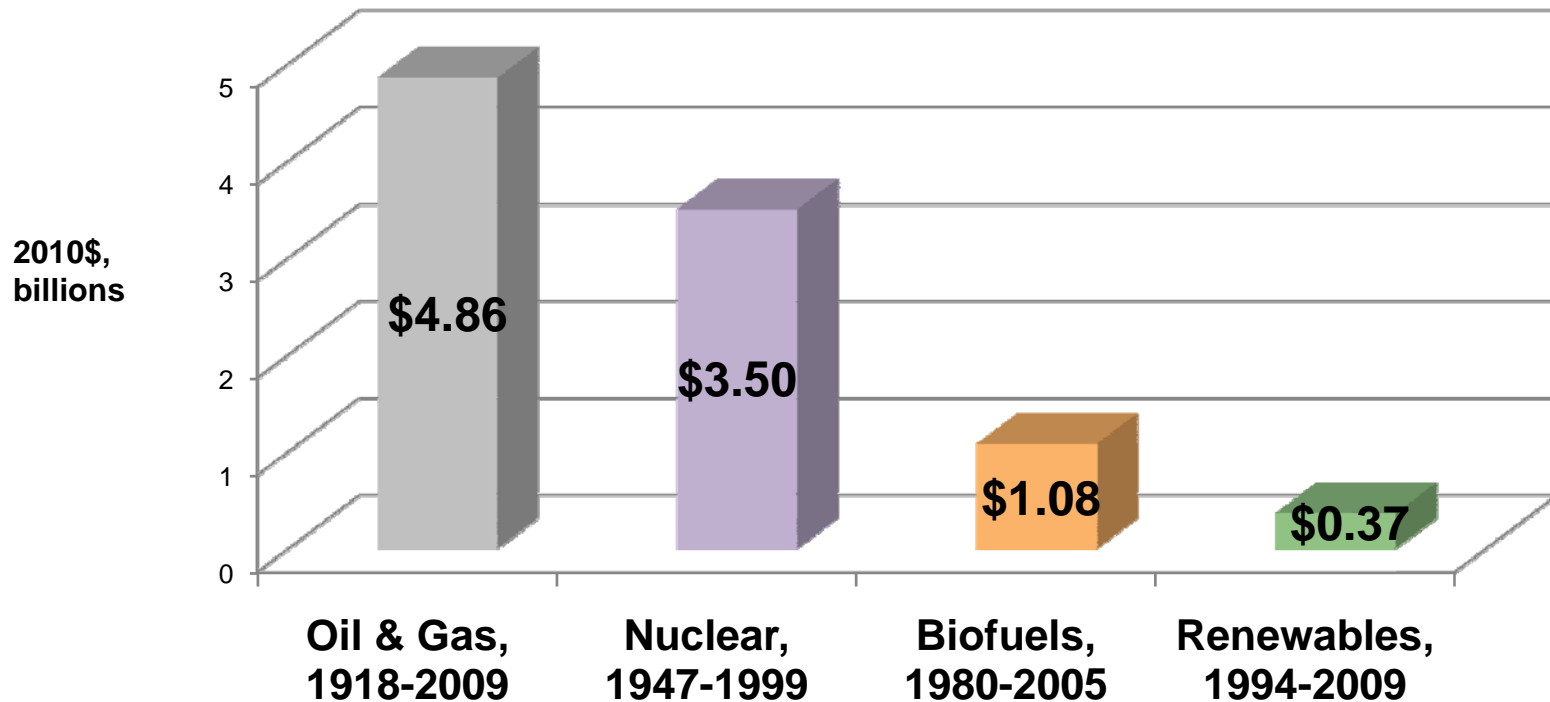
## **Solar Cost Trends**

- Solar power tower contracts under RPS solicitations below 2009 MPR
- Contracts for utility solar PV programs below MPR
- Could see additional cost savings from cap and trade
- Reform permitting/interconnection processes now to take advantage of future cost reductions



# Renewables Oversubsidized?

Historical Average of Annual Energy Subsidies

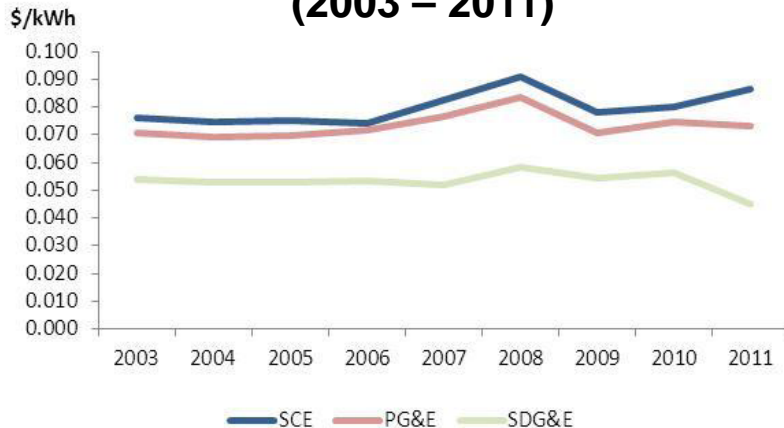






## RPS Procurement Costs for IOUs

**Weighted Average TOD-Adjusted Cost of Delivered Renewable Energy by Year (2003 – 2011)**



Source: California Public Utilities Commission, 4th Quarter 2011

*“... bids from the 2011 RPS Solicitation.....show significantly lower costs than bids from the past few years, which will be reflected in future IOU contracts.”*

*“The weighted average time-of-delivery adjusted cost of all contracts approved from 2003-2011 was approximately 11.9 cents per kilowatt hour (kWh), with a range of 5.4 cents in 2003 to 13.3 cents in 2011.”*

**Weighted Average TOD-Adjusted Cost of Contracts Approved (2003 – 2011)**



Source: California Public Utilities Commission, 4th Quarter 2011





## **Next Steps**

- Written comments due COB May 29
- For instructions on submitting written comments, see May 22 heading at:

**[www.energy.ca.gov/2012\\_energypolicy/documents/index.html](http://www.energy.ca.gov/2012_energypolicy/documents/index.html)**