



2012 Integrated Energy Policy Report Update Proceeding

Renewable Research and Development, American Recovery and Reinvestment Act, and Financing

California Energy Commission
June 6, 2012

DOCKET

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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
- *Renewable Status and Issues Report* in 2011
IEPR laid foundation for plan with 5 high-level strategies to address challenges
- Renewable Strategic Plan 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: R&D, ARRA, and Financing***
- June 11: Minimizing Integration Costs and Requirements



Strategy 5

“Promote and coordinate existing state and federal financing and incentive programs for critical stages including research, development, and demonstration; precommercialization; and deployment. In particular, the state should maximize the use of federal cash grants and loan guarantee programs by prioritizing the permitting and interconnection of California-based renewable energy projects (and their associated transmission or distribution infrastructure) vying for federal stimulus funds.”



Today's Agenda

- Panel 1: Renewable Technologies on the Horizon
- Public Comment
 - ~ Lunch ~
- Panel 2: Financing – Investors Panel
- Public Comment
 - ~ Break ~
- Panel 3: American Recovery and Reinvestment Act Projects: Status and Next Steps
- Case Studies of Project Development
- Public Comment



Renewable Power in California: Status and Issues Report

- Chapter 7: Investment and Financing Issues
- Chapter 9: Research and Development to Support California's Renewable Generation goals
- Appendix H: PIER Project Details

Full report available at:

www.energy.ca.gov/2011publications/CEC-150-2011-002/CEC-150-2011-002-LCF-REV1.pdf



Stages of Renewable Development

Stage 1 Research & Development	Stage 2 Proof of Concept	Stage 3 Deployment / Pilot Facility	Stage 4 Early Commercial	Stage 5 Commercial Maturity
Generate idea, technology, intellectual property	Design and test technology – prototype, build company, improve intellectual property	Prove technical validity in the field, market technology, product development	Prove manufacturing process can be scaled	Proven technology is sold and distributed
Financing Gap 1		Financing Gap 2		
Government				
	Venture Capital			
	Private Equity			
			Public Equity	
			Mergers and Acquisitions	
			Credit (Debt)	
			Carbon Finance	

Source: The Pew Charitable Trusts, Bloomberg New Energy Finance

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Financing Gap #1 – RD&D

- U.S. investments in energy-related R&D have dropped \$1 billion over last decade
- Solar and wind technologies face estimated \$2.6-\$6.2 million annual R&D shortfall
- Private sector share of energy-related R&D down from about $\frac{1}{2}$ in 80's and 90's to around $\frac{1}{4}$ today
- But: national VC investments in clean tech companies \$4 billion in 2010, \$1 billion Q1 2011, and California receives over half of national VC investments
- Government and universities help fill funding gap 8



Financing Gap #2 – Early Commercial

- Capital needed to demonstrate technology viability
- Traditionally use equity, debt financing, or tax equity markets for financing
- Financial crisis has affected ability to use these options
- Power purchase agreements, feed-in tariffs, financial incentives can help fill gap



Addressing Financing Challenges Utility-Scale Renewables

- Research investments by federal and state government, universities
 - National labs and DOE
 - UC research plus tech transfer and expertise
 - Public Interest Energy Research Program
 - \$170 million invested since 1996 in renewable research
 - Sunset of PGC funding on January 1, 2012
 - CPUC created Electric Program Investment Charge to provide \$162 million for renewables and R&D



Addressing Financing Challenges Utility-Scale Renewables

- Tax incentives and subsidies – ITC, PTC
- Accelerated depreciation - 50% bonus depreciation until 12-31-12
- Loan guarantees, program ended 9/2011
- Bonds – federal CREBs and QECBs, state and local bonds



Addressing Financing Challenges DG Renewables

- Leases
- Power purchase agreements
- PACE
- Property tax assessments
- On-bill financing



Next Steps

- Written comments due COB June 13
- For instructions on submitting written comments, see June 6 heading at:
www.energy.ca.gov/2012_energy_policy/documents/index.html
- Final Workshop:
 - 6/11: Integration Costs and Requirements