

PIER Staff Workshop Community Scale Renewable Energy Development, Deployment and Integration

TUESDAY JANUARY 10, 2012

1:30 p.m. to 4:00 p.m.

Hearing Room A

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California Energy Commission**



Meeting Agenda

- Introduction and Welcome 10 minutes 1:30pm
- CEC Presentation 45 minutes 1:40pm
 - Workshop Purpose
 - State Renewable Energy Policy Goals
 - Background
 - Research Funding Areas
 - Administrative Requirements
 - Needed Public Input
- Questions and Comments 2:25pm



Workshop Purpose

1. Share information about the forthcoming Renewable Energy Development, Demonstration and Integration Solicitation
2. Receive public feedback from the public about the content of the Renewable Energy Development, Demonstration and Integration Solicitation and encourage broad participation
3. Seek participation from California Investor Owned Utilities (IOUs) on the problems and issues that can be resolved by this solicitation.
4. Describe emphasis of this solicitation - integration of renewables at the community scale, with a component of breakthrough renewable energy technology development



Workshop Purpose

USE OF GATHERED INFORMATION

The information gathered during this workshop related to issues and potential solutions will be used to design a solicitation that will:

- Result in research to accelerate community scale renewable energy Deployment
- Optimize market penetration of potentially breakthrough renewable energy (RE) technologies,
- Make California's electricity sector more diverse, safe, cleaner, affordable, and able to meet California's 2020 energy goals.



Needed Public Input

- **What are the major concerns of California's IOUs with community scale renewables? How can they be addressed in this solicitation?**
- **How can the solicitation be structured to ensure awarded projects will balance IOU and community-specific concerns?**
- **What is the appropriate role for the IOUs to participate in these projects?**
- **How can intermittent DG resources be best integrated into communities to provide baseload generation and potential backup support during outages?**
- **What are the appropriate metrics of success for high penetration renewable energy integration demonstration projects (cost of generation, renewable capacity deployed, or GHG emissions offset)?**
- **What other significant community scale RE knowledge gaps should demonstration projects aim to address?**
- **How can the Energy Commission encourage proposals from a broad applicant base?**

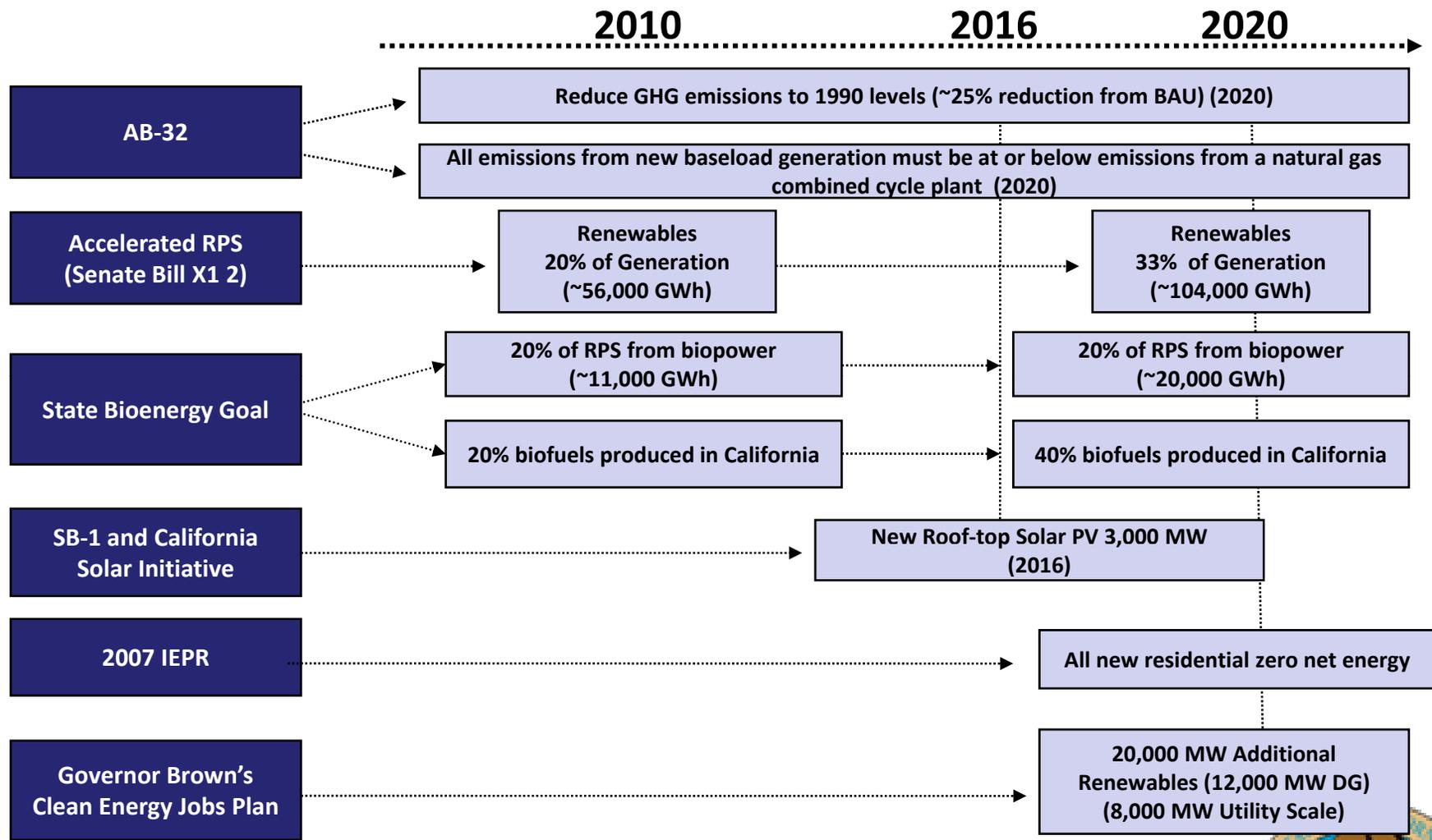
Renewable Energy Policy Goals

Major policies in California driving the deployment and integration of utility-scale renewable energy resources and the need for RD&D in this area include:

- **Governor Brown's Clean Energy Jobs Plan**, which calls for 12,000 MW of localized renewable generation by 2020 and 6500 MW of additional CHP capacity by 2030.
- **Senate Bill X1 2**, which orders the Renewable Portfolio Standard (RPS) to be increased to 33 percent by 2020, and
- **Assembly Bill 32** (Global Warming Solutions Act), which sets the maximum allowable level of statewide greenhouse gas emissions in 2020 at the level of emissions in 1990.



California Energy Policies



Barriers Limiting Renewable Energy Deployment

- **High System Cost**

- The major barrier in deploying renewable energy is the high upfront cost. This can be mitigated with lower cost or higher efficiency technologies and finding applications for waste by-products.

- **Intermittency and Variability**

- Another barrier is that many renewable energy sources are intermittent in nature, this variability has a negative impact on the grid. Thus there is a need for innovative ways to integrate renewable resources in a manner that minimizes the effects of variable generation on the grid.

- **Permitting and Optimizing the Use of Finite Resources**

- Permitting issues, especially when the environmental impacts are not understood can cause delays in a renewable energy project. Understanding the environmental impacts and reducing the water and land use of renewable energy technologies can speed up the permitting process and minimize the effects on California's climate.



Background

- PIER Renewable Research has recently focused on addressing deployment and integration issues at these 3 market scales:
 - Building Scale – Making technological advances towards Zero-Net Energy (ZNE) Buildings
 - Utility Scale (>10MW)– Ensuring affordable, reliable and environmentally responsible deployment of utility scale renewables
 - Utility Scale Renewable Energy (USRE, 2010)
 - Community Scale (<10MW) – Developing and deploying the tools, models, and integration strategies to make strides toward ZNE communities
 - Renewable Energy Secure Communities (RESCO, 2009)

- The upcoming solicitation addresses *community scale* deployment and integration of renewables



Background

Utility Scale Renewable Energy (USRE)

- Research to allow more reliable and environmentally responsible deployment of Utility-Scale Renewable Energy (USRE) to the California electricity grid. Key issues addressed include:
 - Mitigation of intermittent renewables (wind and solar)
 - Minimization of utility scale solar development impacts

- Solicitation released on Nov. 2, 2010 and NOPA released on March 21, 2011

- Funding 8 projects out of 27 proposals covering 4 topic areas:
 - A. Renewable Hybrid Generation and Energy Storage Integration Demonstration
 - B. Monitoring and Forecasting Analysis
 - C. Thermal Energy Storage Modeling
 - D. Environmental Mitigation for Utility-Scale Solar Energy Technologies

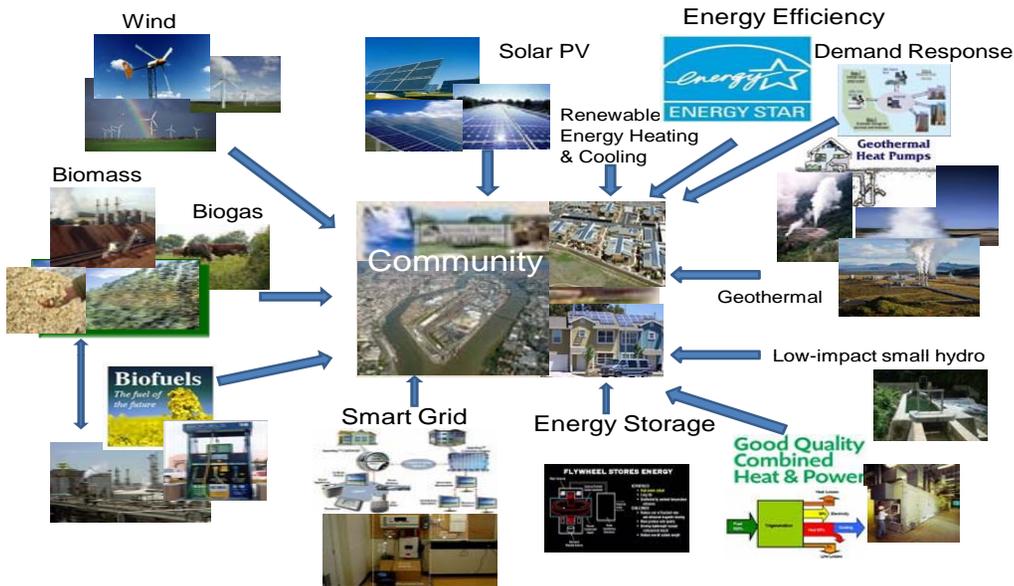
- Total Funding - \$7 Million



Background

RESCO - Renewable Energy Secure Community

Building Blocks of Renewable-based Energy Secure Communities (RESCO)



- 11 projects from 2009 solicitation
 - \$12.3 Million awarded
 - Integration projects (8)
 - Exploratory
 - Pilot Stage
 - Implementation
 - Collateral projects (3)

- Communities took steps to secure up to 100% energy supply (electricity and fuel) from locally-available renewables.
- Solicitation received over 50 proposals.

Example Demonstration: UC Davis West Village

Project Objective: Build a zero-net energy mixed use community that offers:

- Housing for ~2,000 students
- 340 homes
- An education center
- A ten-acre recreation field complex
- A village square with neighborhood-serving retail uses.

Planned technologies to achieve Zero-net Energy (ZNE) include:

- Energy efficiency (passive & active)
- Demand response
- Distributed Solar, Photovoltaic
- Distributed Solar Thermal
- Biogas digester
- Fuel Cells
- Advanced energy storage
- Smart Grid technologies
- Bio-methane upgrade system
- Bio-fuels for transportation



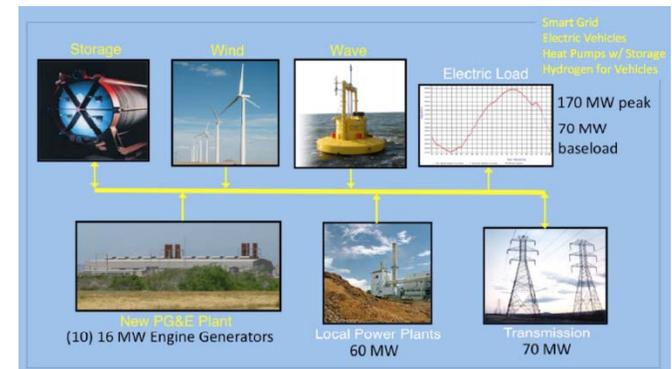
* Photo Credit: UC Davis

Example Exploration: Humboldt County RESCO

Goal: Develop an optimal clean energy portfolio for Humboldt County to meet 75% of electricity and a majority of heating and transportation energy

Highlights:

- Resource and Technology Assessment
 - Primarily Biomass and Wind, some small hydro
- Economic Assessment
 - Created economic impact model for energy efficiency, utilized JEDI and NREL models for other resources
- Strong Stakeholder Support
 - Conducted several stakeholder workshops to ensure public buy-in
- Utility Support
 - PG&E assisted with project analysis and has been helpful for the effort
- Strategic Plan
 - Formulating community plan for smart development of renewables in Humboldt County



Community Scale Renewable Energy Development, Deployment and Integration Solicitation

- Builds from and broadens the concept introduced in the 2008 RESCO solicitation
- Incorporates feedback from the 2011 RESCO Contractor survey
- A minimum of one renewable resource is required, along with at least one “enabling technology”
- Potential for advancing exploratory projects into the next phase
- Increased focus on localized RE development and DG technologies
- Participation of Investor Owned Utilities (IOUs) is highly encouraged
- Includes a breakthrough renewable energy technology development component



Research Funding Areas

- I. **Community Scale Renewable Energy Integration Demonstration**
- II. **Community Scale Renewable Energy Integration Exploration**
- III. **Breakthrough Renewable Energy Technology Demonstration**

Total Solicitation Funding ~ \$9 Million



Eligible Projects

I. Community Scale Renewable Energy Integration Demonstration

- Demonstrate the integration of locally-available community scale (less than 10MW) renewables as a reliable and affordable source of energy generation.
- Proposals should focus on conducting demonstration projects that:
 - Take advantage of locally-available renewable resources
 - Leverage existing community and utility energy development plans
 - Achieve a significant reduction in the amount of electricity imported from external sources
 - Achieve reliance on an affordable portfolio of local renewable energy resources for electricity
 - Support the advancement of renewable energy for heating and transportation energy demand
- Proposals which receive the consent and support of an electricity investor-owned utility (IOU) will receive a scoring preference

Eligible Projects

II. Community Scale Renewable Energy Integration Exploration

- Development of the strategies, models and tools to assist communities in the optimum deployment of community-scale renewable energy generation portfolios, consistent with the specific needs and available resources of that community.
- Proposals should:
 - Leverage lessons learned from previous renewable energy integration projects
 - Customize and develop any necessary modeling tools
 - Formulate a community wide energy action plan that identifies a long-term vision of reliance on renewable energy as well as near-term actions to achieve that vision.
- Proposals which receive the consent and support of an electricity investor-owned utility (IOU) will receive a scoring preference.

Eligible Technologies

- Proposals should include at least 1 renewable and at least 1 “enabling technology”, including:

Renewable Resources

Solar PV
Concentrating PV
Solar Thermal
Wind Energy
Biomass/Biogas
Small Low-Impact Hydro
Geothermal

Enabling Technologies

Energy Storage
Fuel Cells
Combined Heat, Cooling and Power
Grid integration Technologies
Biofuel Generation
Electric Vehicle (EV) Charging
Energy Efficiency
Demand Response
Geothermal Heat Pumps
Solar Hot Water

Possible Demonstration Sites

- Commercial business parks
- Industrial business parks
- Urban neighborhoods
- Suburban neighborhoods
- Shopping centers
- Rural Communities
- Military Complexes
- Institutional/Municipal Facilities
 - E.g. Hospitals, prisons
- College Campuses



Potential Project Partners

- **State Agencies** – Strategic Growth Council, CPUC, CARB, CalTrans, etc.
- **Regional and Local Agencies** – AQMD's, Metropolitan Planning Organizations (MPOs), etc.
- League of California Cities/California State Association of Counties
- **Military** – US Air Force, US Navy, US Army, etc.
- **Federal Agencies** – USDOE, US EPA, Housing and Community Development (HCD), etc.
- **Investor Owned Utilities** – PG&E, SCE, SDG&E
- **Equipment Manufacturers and Installers**
- **Industrial Plant Owners and Operators**
- **Building Owners, Real Estate, Home Owner Associations.**

Eligible Projects

III. Demonstration of Breakthrough Renewable Energy Technology

- Proposals should aim to develop an innovative and breakthrough renewable energy technology or application that offers significant advantages over existing technologies or applications at the community scale (less than 10 MW).

- Breakthrough Technology proposals should provide:
 - Significant commercial potential by 2020
 - Cost-effective in high penetration community renewable applications
 - Large improvement of similar existing technologies
 - Application to a large number of communities in California
 - Ability to be licensed in the near term
 - A “think outside the box” mentality

Breakthrough Renewable Energy Technologies

- Potential research themes
 - Major cost reductions to existing technology
 - Major efficiency increases
 - Applications in a wide range of industries and sectors
 - Ability to expand renewable resource available

Preferable Proposal Attributes

- **Broad support across sectors such as utilities, local, state, and federal agencies, equipment manufacturers and installers, and research institutions.**
- **Visibility and community outreach such as:**
 - Proximity to job centers and other high traffic locations.
 - Accessibility to the public.
 - Strong Project Advisory Team.
- **Potential to develop replicable and integrated decision-making frameworks for future projects.**
- **Thorough project plan that demonstrates “shovel readiness”.**
 - Permits in place.
 - Cost share funding secured.
 - Project will be completed no later than March 2015
- Other criteria such as connection to state energy policy, opportunities unaddressed by other research entities, potential impact per dollar spent, and the potential for partnership with other organizations, particularly Investor-Owned Utilities (IOUs).



Administrative Requirements

- Demonstration sites must be located in California IOU service territory
- At least 60% of Energy Commission award must be spent in California
 - Additional points awarded incrementally for up to 100% California spending
- Projects with IOU support will receive additional points
- Loaded hourly rates (direct labor plus overhead, G&A) will be scored as part of the proposal

Solicitation Schedule

Task	Tentative Schedule
Informational Workshop	January 10, 2012
Release Solicitation	February 16, 2012
Proposals Due	April 2012
Projects Begin	September 2012
Projects End	March 2015*

* March 2015 is a hard deadline for all research to be completed



Needed Public Input

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Availability of Workshop Documents and Information

Documents and presentations for this meeting will be available online at

<http://www.energy.ca.gov/research/notices/>

Interested parties may also sign on to the Energy Commission electronic mailing list to ensure they are notified of future solicitations.

<http://www.energy.ca.gov/research/>



Thank you

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**Please submit comments by:
Friday January 13, 2012**

