# Pre-Solicitation Staff Workshop
# Utility Scale Renewables Energy (USRE)

**TUESDAY, APRIL 6, 2010**

1:30 p.m. to 3:30 p.m.

Hearing Room A
California Energy Commission
1516 Ninth Street
Sacramento, CA, 95814

# Energy Commission Contacts

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# Workshop Purpose

## NEEDED INFORMATION

- To gather input from experts and stakeholders regarding RD&D needs related to more rapid and environmentally responsible deployment of utility scale renewables energy (USRE) power plants in the California electricity grid

- Discuss technology development and deployment scenarios, barriers to future deployment including environmental constraints, the role of energy storage, improving information for planners to avoid costly deployment delays and sub-optimal system and plant performance

- Discuss enabling technologies that can be used to better integrate power plant and transmission grid operation while minimizing impacts to sensitive environmental resources and fresh water consumption

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# Workshop Purpose

## USE OF GATHERED INFORMATION

The information gathered during this workshop related to issues and potential solutions will be used to

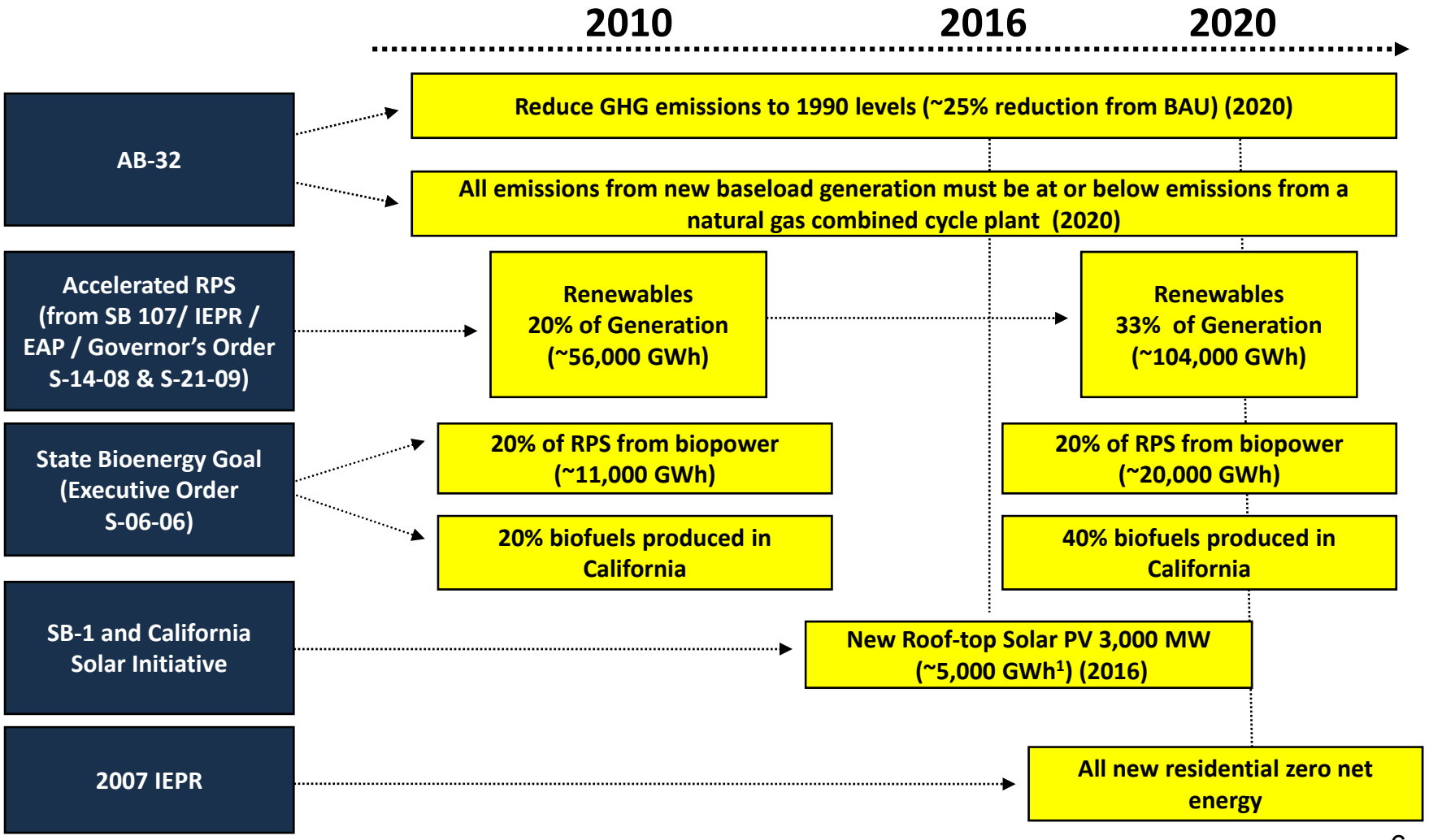
- design a solicitation that will provide funding to support accelerated USRE RD&D and deployment, and
- will help to optimize market penetration of multiple renewable energy (RE) technologies,
- make California's electricity sector more diverse, safe, cleaner, and affordable.

# RENWABLE POLICY GOALS

Two major policies in California driving the deployment and integration of utility-scale renewable energy resources and the need for RD&D in this area are

- **Executive Order S-14-08**, 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.

# Solicitation will help Achieve State Policy Goals



# Background

- An increasingly diverse array of renewable energy technologies is currently under development and deployed in an equally diverse array of ways, ranging from utility scale power plants to energy sources for buildings that require no net energy from the local grid.
- The primary technical challenges relate to the technologies, tools and strategies that enable integrated technology use.
- Technical challenges confront the integration of renewable energy facilities with the surrounding environment in a manner that has low environmental impact.
- Barriers to the large scale adoption of renewable energy technologies continue to include cost and environmental considerations.

# Funding Availability

| | |
|---|---|
| **PIER Renewables:** | **$4.2 million** |
| **PIER Environmental:** | **$1.0 million** |
| **GRDA:** | **$4.8 million** |
| **TOTAL:** | **$10.0 million** |

**Maximum amount for a single proposal: $1 million to $2 million**

**Anticipated number of Projects: 5 to10**

**Multiple proposals from same applicant: Yes****

****However, each proposal must be for a distinct, separate project and must be submitted separately adhering to all requirements contained in this solicitation.**

# Eligible Projects

The Utility Scale Renewables Energy (USRE) Program at the California Energy Commission will identify and develop data, technologies, and tools needed to plan and operate large RE power plants in concert with state, regional, and local transmission resources. This solicitation aims to fund projects whose results will enable accelerated and optimized USRE deployment in an environmentally responsible manner.

Proposed projects should address technology solutions that support planning for high levels of RE penetration in the California electricity grid at the lowest cost, highest value grid and RE plant operation, and lowest environmental impact and fresh water consumption.

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# Eligible Projects

There are ***five major research areas*** to target in this research endeavor, taking into account 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.

# Eligible Projects

## Hybrid Generation

Addresses the synergistic integration, at the power plant level, of a renewable generation source with another generation resource (renewable or fossil) and/or a storage resource in a way that enhances the value or reduces the cost of generation.

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# Eligible Projects

## Monitoring and Forecasting

Focuses on the forecasting and monitoring of variable/intermittent output renewable energy in a way that helps the grid accommodate its variable output. Particular emphasis will be placed on solar given the relative importance of this area and the potential for solar generation to be deployed more diversely across system sizes and locations.

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# Eligible Projects

## Renewable Energy Integration

Resolve renewable energy integration issues across regions and technology mixes and provide quantitative metrics to address those issues. This work will build on existing intermittency/variability and integration projects and will focus on continued development of modeling tools while also convening key stakeholders.

# Eligible Projects

## Renewable Environmental Mitigation Technologies

- environmental issues of land and water use,
- mitigation of negative environmental impacts in sensitive regions, particularly in the desert while enhancing value of renewable energy projects.
- e.g. developing new solar power technologies, designs or approaches that mitigate adverse impacts of solar development on sensitive biological and water resources in the California desert, such as:
  - reduced solar plant footprint, and/or
  - land impact,
  - reduced water consumption,

# Eligible Projects

## GRDA Renewable Energy Projects

Projects that support or develop plans and scenarios that will help the development, deployment and integration of geothermal and other RE sources, and aim to increase the penetration of geothermal into the energy generation mix.

# Examples of PIER Projects

- cost-effective wind/solar/geothermal/storage /grid integration for USRE power plants
- intermittent renewable (wind/solar) forecasting demonstration
- Identification of technology gaps and needed development and demonstration of collaborative Integration technologies
- data collection in support of day- and hour-ahead solar and wind forecasting
- field demonstrations and pilot projects to address use of larger energy storage systems (greater than 5 MW ratings for at least four hours) that can be connected to the transmission system.
- evaluation of very large energy storage systems, such as compressed air energy storage (CAES) and pumped hydroelectric systems, for situations in which there is a need for storage systems that can store hundreds of MWs for several hours.
- Evaluation of generation designs to reduce environmental impacts, including reduced water consumption.

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# Needed Public Input

- **What are the goals and desirable benefits in advancing RD&D and deployment of USRE?**

- **What are the key technical, economic, environmental, and institutional issues or opportunities for USRE implementation?**

# Needed Public Input

- **What are the RD&D solutions and market mechanisms for accelerated development and deployment of USRE?**

- **What are the RD&D solutions and market mechanisms for reducing land and fresh water demands, and biological and environmental impacts of utility scale solar energy development, particularly in the California desert?**

# 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.

# Questions

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## Geothermal Resources Development Account Program

### *Mission*

- Promote the research, development, demonstration and commercialization of California's geothermal resources

# GRDA and PIER Joint Solicitation

**GRDA Project Funding**

- The Commission will allocate at least 25% of GRDA available funding to projects in each of three project categories:
  1) Resource Development,
  2) Planning, or
  3) Mitigation

# GRDA Projects Eligible for Funding

**Resource Development Projects**

- An eligible activity, including research, that assesses, develops, or converts a geothermal resource in conjunction with another renewable resource for electrical generation

**Examples of Resource Development Projects**

- Demonstrations or commercialization of geothermal technologies
- Resource assessment including geological, hydrological, geophysical and geochemical.
- Evaluation, drilling, and testing of exploration, production, and injection wells
- Co-production from oil and gas fields, low temperature resources, integrated renewable energy sources, etc.
- Development of direct-use projects including space heating/domestic water supply and industrial process heat

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# GRDA Projects Eligible for Funding

## Planning Projects

- An eligible activity that regulates or guides the development and use of geothermal resources in conjunction with other renewable energy resources

## Example of Planning Project

- Collection and analysis of environmental data

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# GRDA Projects Eligible for Funding

**Mitigation Projects**

- An eligible activity that identifies the adverse environmental or public service impacts of geothermal in conjunction with other renewable energy developments, or implements measures to reduce or eliminate those impacts

**Examples of Mitigation Projects**

- Identification and control of adverse impacts to water, air, wildlife, vegetation, viewshed, ground surface levels, and ambient noise levels
- Environmental enhancement

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# Needed Public Input

- **What are the goals and desirable benefits in advancing RD&D and deployment of USRE?**
- **What are the key technical, economic, environmental, and institutional issues or opportunities for USRE implementation?**
- **What are the RD&D solutions and market mechanisms for accelerated development and deployment of USRE?**
- **What are the key technical, economic, environmental, and institutional issues or opportunities for USRE implementation?**

# THANK YOU