

Proposed Energy Research Initiative  
Questionnaire

**Title of Proposed Initiative: Deployment of Bioenergy Solutions That Support California's Industries, the Environment, and the Grid.**

**Investment Areas** (Check one or more) – *For definitions, see First Triennial Investment Plan, page 12:*

- Applied Research and Development
- X Technology Demonstration and Deployment
- Market Facilitation

**Electricity System Value Chain (Check only one):** See CPUC Decision 12-05-037, Ordering Paragraph 12.a. [http://docs.cpuc.ca.gov/PublishedDocs/WORD\\_PDF/FINAL\\_DECISION/167664.PDF](http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/167664.PDF).

- Grid operations/market design
- X Generation
- Transmission
- Distribution
- Demand-side management

California Energy Commission

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**Issues and Barriers:**

Describe the issues and barriers that are impeding full market adoption of the proposed clean energy technology or strategy (such as cost, integration, or lack of information).

Biopower technologies have a variety of challenges limiting full-scale commercial deployment. The Governor's Bioenergy Interagency Working Group has identified these challenges in the 2012 Bioenergy Action Plan, and the CEC addressed a section of its 2012-2014 Triennial Investment Plan to addressing those challenges (S13.1). The identified challenges included cost-effective pollution control technologies, biomass feedstock transportation and handling systems, perceived technical risks, and high capital costs. The 2012-14 investment plan proposed to advance pre-commercial technology demonstration and early-stage deployment of biopower and biogas technologies and systems, including technologies, processes, and strategies successfully demonstrated at pilot scale. The overall goal was to address issues limiting full-scale deployment and develop publicly available data on the operational characteristics of these technologies and best practices to reduce the overall cost of generation.

Because of delays in the adoption of CPUC policies to implement SB 1122 and because the first funding from the 2012-14 triennial investment plan will not be made available to the technologies and issues identified in S 13.1 until the end of 2014, none of the issues and barriers targeted by these programs have been addressed.

With a reduced timeline to deploying these beneficial renewable technologies within the timeframes set forth by the CA legislature, it is even more critical that resources be made available to address the identified barriers.

**Initiative Description and Purpose:**

How will this technology or strategy help address the issue/issues? Describe knowledge to be advanced to overcome critical barriers. Include the recommended funding level (minimum and maximum) for each project under this initiative.



It is proposed that the CEC include S13.1 in the 2015-17 Triennial Investment Plan along with associated funding initiatives to address the identified challenges to community-scale bioenergy facility development.

**Stakeholders:**

Bioenergy Association of California (BAC)  
State Wood Energy Team (SWET)  
US Forest Service  
Biomass Working Group  
Sierra Nevada Conservancy  
CalFire

**Background and the State-of-the-Art:**

What research development and demonstration has been done or is currently being done to advance this technology or strategy (cite past research as applicable)?

As previously noted, research and demonstration on the identified initiatives has been delayed. Some CEC funding has been allocated to gasification research, but this has been in laboratory settings and not focused on forest bioenergy.

Describe any public and/or private successes and failures the technology or strategy has encountered in its path through the energy innovation pipeline: lab-scale testing, pilot-scale testing, pre-commercial demonstration, commercial scale deployment, market research, workforce development.

Early phase development and technologies have been commercially deployed in different settings and/or with different feedstocks with mixed results. Many projects have been very challenged due to low capitalization common to new technology deployment. Feedstock handling and preparation is particularly challenging for forest bioenergy. Funding support for improved feedstock handling/preparation/syngas cleanup would be helpful.

Identify other related programs and initiatives that deal with the proposed technology or strategy, such as state and federal programs or funding initiatives (DOE, ARPA-E, etc.).

While several sources of funding have been used to complete feasibility studies for forest bioenergy facilities (USDA, HUD CDBG, Air District TAP programs, etc.), no other federal or state initiatives currently address the targeted issues at the demonstration or deployment level.

**Justification:**

Describe how this technology or strategy will provide California IOU electric ratepayer benefits and provide any estimates of quantified annual savings/benefits in California, including:

- Name of sector and estimated size and energy use – The proposed program will primarily benefit the 250 MW of projects promoted under SB 1122, though other projects in rural areas will also be benefitted.
- Quantifiable performance improvements for the proposed technology/strategy. The most critical metrics will be reduced costs and increased deployment.
- Maximum market potential, if successful. The proposed technology will be the 250 MW identified in the SB1122 legislation, as well as additional markets for bioenergy distributed generation developed

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CALIFORNIA ENERGY COMMISSION

outside of that program.

- Number of direct jobs created in California. 1000 jobs (estimate based on average 4 jobs/MW)
- Why this research is appropriate for public funding. SB 1122 is an indication that the CA legislature believes there will be a public benefit from the development of community-scale bioenergy facilities, and that these benefits justify potential higher price for power generated from these facilities. By overcoming technical obstacles to bioenergy project implementation and developing best practices for operations, this research will promote the legislature's intent as stated in SB 1122 and will reduce costs of generation, allowing for reduced power costs.

**Ratepayer Benefits** (Check one or more):

Promote greater reliability

Potential energy and cost savings

Increased safety

Societal benefits

Environmental benefits – reduction of greenhouse gases from waste materials used to generate power

GHG emissions mitigation/adaptation in the electricity sector at the lowest possible cost

Low emission vehicles/transportation

Waste reduction

Economic development

Describe specific benefits (qualitative and quantitative) of the proposed initiative

Quantitative benefits include:

- Reduction in the capital costs of community scale bioenergy facilities and the corresponding increase in facility development;
- Increased jobs generated in rural areas from community-scale distributed generation facilities;
- Reduction in GHGs from disposal of wastes through conversion into renewable power

Qualitative benefits will include:

- Increase in forest health from promotion of forest bioenergy industry
- Increase in water quality from promotion of dairy digester industry
- Reduced landfill impacts on communities from waste diversion

**Public Utilities Code Sections 740.1 and 8360:**

Please describe how this technology or strategy addresses the principles articulated in California Public Utilities Code Sections 740.1 and 8360. The California Public Utilities Code is available online at [www.leginfo.ca.gov/cgi-bin/calawquery?codesection=puc](http://www.leginfo.ca.gov/cgi-bin/calawquery?codesection=puc). The technology will provide benefits to ratepayers by protecting IOU infrastructure in forested areas from danger of wildfire. The project will also support the objectives of environmental improvement, development of energy renewable resources, and reduction in operating costs. The project will also support 8360's policy to deploy cost-effective generation using renewable resources.