



QUESTIONNAIRE SUBMITTED BY COALITION FOR RENEWABLE NATURAL GAS

Title of Proposed Initiative (Short and concise): *Demonstration and support for the operation of anaerobic digestion, gasification and emerging conversion technologies to produce energy from California's plentiful biomass resources – particularly waste biomass resources.*

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

- Applied Research and Development
XX 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.

- Grid operations/market design
XX 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).

Emerging bioenergy projects from waste need a significant commitment of financial support up-front with generous project development assistance to prove their commercial success and increase the beneficial reuse of waste into electricity. Cost is the major barrier to adoption of these advanced and highly beneficial technologies.

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.

EPIC funding should be available for demonstration of anaerobic digestion, gasification and emerging conversion technologies to produce energy from California's plentiful biomass resources – particularly waste biomass resources. The lowest carbon fuels potentially available for development are waste biomass resources – as clearly documented by CARB's own Low Carbon Fuel Standard (LCFS). The lowest carbon fuels in CARB's LCFS are waste-derived biofuels. AB341 (Chesbro, 2011) set a statewide solid waste diversion goal of 75% and CalRecycle is currently focusing on ways to get the organic waste component of the waste stream out of landfills. The EPIC program should support efforts to enhance existing and develop new anaerobic digestion technologies at wastewater treatment plants and other locations to accept organic wastes to maximize biomethane production to meet California's renewable energy needs. Furthermore,

grants should be available to encourage development of gasification and emerging conversion technologies that generate electricity from biomass and waste biomass.

Recommended funding level: \$10 million - \$15 million.

Stakeholders:

Identify the stakeholders who support the initiative.

Stakeholders include California electricity consumers, rural and urban municipal governments, renewable energy industry, general public, solid waste industry.

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)?

Existing anaerobic digestion technologies are available for use at wastewater treatment plants and other locations; however, advanced technologies also should be encouraged and will promote acceptance of organic wastes to maximize biomethane production to meet California's renewable energy needs. Gasification and emerging conversion technologies for waste are poised for pilot plant demonstration and scale up.

- 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.

Failure or success most often is a result of proper funding. Technology is available for beneficial use of organic waste to generate biomethane, and advances in technology, technological design and invention of new technology will result as more facilities are built and operated and new technology is demonstrated.

- 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.).

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 renewable energy sector/solid waste sector/wastewater treatment sector/municipal government sector.

- Quantifiable performance improvements for the proposed technology/strategy.

Support is needed to retrofit existing wastewater treatment facilities and other organic waste facilities to generate electricity from organic waste. Performance can be improved at these facilities by the demonstration of advanced and more efficient technologies and project designs. Conversion technologies will benefit from increasing market size and innovations that result from funding availability.

- Maximum market potential, if successful. *California disposes of an estimated 37 million tons of waste in landfills each year, of which more than 10 million tons is combustable organic waste that is suitable for anaerobic digestion, gasification and conversion to energy.*
- Number of direct jobs created in California. *TBD*
- Why this research is appropriate for public funding.

EPIC funds should be used to assist public entities such as municipalities who are responsible for waste disposal and benefit from the generation of electricity from waste. Current state policy calls for diversion of organic wastes, and public funding through EPIC will support this public policy as well as provide California's electricity customers with a more diverse, cleaner and more stable energy supply.

Ratepayer Benefits (Check one or more):

- Promote greater reliability
- Potential energy and cost savings
- Increased safety
- Societal benefits
- Environmental benefits – specify – lower emissions of greenhouse gases/beneficial use of waste
- 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

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.

Support for organic waste to energy technologies offers a high probability of providing benefits to ratepayers and supports, but does not duplicate current research. Projects support:

- (1) Environmental improvement.*
- (2) Public and employee safety.*
- (3) Conservation by efficient resource use.*
- (4) Development of new resources, particularly renewable resources.*
- (5) Improve operating efficiency and reliability and otherwise reduce operating costs.*