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In the matter of:	)	Docket No. 19-ERDD-01
	)	
Request for Comments on Draft Solicitation	)	Research Idea Exchange
	)	RE: Comments on Draft Solicitation
	)	

Notice of Request for Comments on Draft Solicitation on Demonstrating Innovative Solutions to Convert California's Residual Forest Biomass Resources into Renewable Natural Gas

California Energy Commission staff is developing a competitive Grant Funding Opportunity (GFO) through the Natural Gas Research and Development (R&D) Program aimed at developing and demonstrating innovative technologies for the conversion of forest waste biomass to renewable natural gas (RNG). Staff is seeking input from stakeholders on the proposed research approach, and more specifically seeks input to the questions asked about the proposed research targets at the end of this document.

GFO Background

In October 2015, Governor Brown proclaimed a state of emergency in response to more than 22 million dead trees in California's forests.[1] Since then, the number of dead trees in California's forests has risen dramatically, totaling 129 million according to the U.S. Forest Service in December 2017.[2] Millions of additional trees are weakened and are expected to die in the coming months and years.

Dead and dying trees can elevate the risk of catastrophic wildfires, which pose a significant threat to human safety, human health, and the environment. Removal of dead and dying trees can help reduce the chances of catastrophic wildfires while also promoting forest health, reducing environmental impact, and contributing to habitat protection.

However, there are very high costs associated with the removal and transportation of the biomass waste material. Due to these high costs, typical practice is to pile the

[1] "Proclamation of a State of Emergency 10-30-2015 Tree Mortality State of Emergency." State of California Executive Department. Oct. 30, 2015. https://www.gov.ca.gov/docs/10.30.15_Tree_Mortality_State_of_Emergency.pdf.

[2] "Record 129 Million Dead Trees in California". U.S. Forest Service. December 12, 2017. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd566303.pdf

material and burn it in an open environment to dispose of it. Federal and state forest services, fire officials, local air districts, land owners, rural communities, and various other stakeholders have expressed a need to develop methods for using forest biomass to improve the cost-effectiveness of removing dead and dying trees.

Depending on economic and geographic considerations, bioenergy pathways that convert forest waste to energy could contribute to Renewable Portfolio Standard goals, contribute to Low-Carbon Fuel Standard goals, reduce environmental impact compared to open burning, and contribute to rural economies while simultaneously promoting sustainable forest management. Specifically, RNG from forest waste biomass could be used to produce renewable heat, renewable power, and renewable gas for transportation applications.

GFO Focus

This GFO aims to improve efficiency, reduce costs, and reduce the environmental impact for the forest waste to RNG energy pathway. There is up to $4,000,000 available for grants awarded under this GFO, with a minimum award of $750,000 and a maximum award of $2,000,000. Match funding will be required in the amount of at least 10 percent of the requested funds.

Technologies of interest include systems that convert biomass into intermediate products (e.g., synthesis gas) as well as cleaning and upgrading systems that further refine intermediate products into RNG. Projects must perform a pilot-scale demonstration of the proposed technology pathway and should meet technical targets specified in Table 1.

Table 1: Technical Targets for the Pilot Demonstration

Parameter	Target
Gas Quality:[3]	Of suitable quality to meet natural gas standards in California Investor Owned Utility (IOU) Territory including: Heat Content: 990 – 1150 British Thermal Units per Standard Cubic Feet (BTU/scf) Total Sulfur: <12.6 parts per million (ppm)
Scale of Pilot Demonstration:	50-100 scf/min RNG output (2.97-5.94 mmBTU/hr)
Length of Pilot Demonstration:	500 hours total runtime (including 16 hours of continuous, steady state operation)
Emissions:	Complies with local air district standards
Maturity:	TRL 3 to 6 at project initiation, TRL 6 or greater by project

[3] SoCalGas Rule 30 and PG&E Rule 21. If standards change during the agreement term, technical targets will change accordingly.

	conclusion

Projects must also provide analysis showing that when commercially mature, the proposed technology pathway can achieve the technical and cost targets specified in Table 2.

Table 2: Technical and Cost Targets for a Commercially-Mature System

Parameter	**Target**
Levelized Cost of Methane	$12-21/mmBTU
Payback	10 yr
System Lifetime	15 yr

In addition to the technical and cost targets above, proposed projects must:

- Perform the 500-hour pilot demonstration in natural gas IOU territory.
- Demonstrate a whole system approach from biomass feedstock to high quality RNG. Projects that focus on only one component (e.g., gas cleanup) are not eligible for funding.
- Sample and analyze the RNG produced to verify high quality consistent with natural gas standards.
- Include a techno-economic analysis for a full-scale facility as part of the proposed project. Include in the analysis the programs and incentives that would be leveraged to improve economics.
- Adhere to the following feedstock requirements:
    - All test and demonstration activities must be performed using woody biomass feedstocks (e.g., forest slash, orchard prunings, green waste) as fuel. Feedstock may be processed (e.g., ground, chipped, or pelletized) or unprocessed.
    - All feedstock used for test and demonstration activities must be **waste** biomass only – not purpose-grown energy crops.
    - At least half of all feedstock used for test and demonstration activities must be **forest waste** biomass.
    - Proposed projects must identify the feedstock strategy including where feedstock will be sourced and what types of feedstock will be used.

Proposed projects are also encouraged to:

- Discuss the proposed technology's potential to displace open burning of biomass and contribute to decreased wildfire risk.
- Leverage generation of value-added co-products, such as bioproducts or biofuels, in addition to RNG.

- Use the RNG produced in an end-use application such as heating, electricity generation, or transportation fuel.

Possible projects funded include:

- A gasification to methanation process which uses innovative components and/or methods to significantly reduce capital and operating costs compared to conventional systems.
- A hybrid system which combines gasification with unconventional methods (e.g., dry fermentation, water electrolysis) to demonstrate an innovative biomass to RNG pathway.

Questions

Energy Commission staff is seeking input from interested stakeholders on the above excerpts from the draft GFO.

1. Are the technical targets for the pilot demonstration clear and reasonable? Should they be narrowed further? If not, why not? Please identify the specific targets that should be changed and the recommended change.

2. Are the target cost and technical specifications for a commercially-mature system clear and reasonable? Should they be narrowed further? If not, why not? Please identify the specific targets that should be changed and the recommended change.

3. Will a technology that achieves these targets have the characteristics required for a commercially-viable woody biomass to RNG system? What targets are missing that would help improve commercial viability?

4. Are the feedstock requirements clear and reasonable?

5. Are the correct technologies being focused on (conversion, cleanup, and upgrading systems)? Are there components that offer more opportunity for cost reduction?

6. What is the best way to evaluate the levelized cost of methane presented by proposed projects? Would requiring a technical overview of the pathway, assumptions used, and economic estimates be sufficient?

Natural Gas R&D Program Background

The Natural Gas R&D Program is funded by a surcharge on natural gas consumed by ratepayers of natural gas IOUs in California (see California Public Utilities Code section 890). The California Public Utilities Commission (CPUC) designated the California

Energy Commission as administrator of the program in August 2004.[4] The purpose of the program is to benefit California natural gas ratepayers by funding public interest research and development activities, which the CPUC has defined as "developing science or technology, the benefits of which accrue to California citizens and are not adequately addressed by competitive or regulated entities."[5]

The Energy Commission is committed to supporting the inclusion of a diverse group of participants from disadvantaged and underrepresented businesses and communities – including disabled veteran-, women-, LGBTQ- and minority-owned businesses.

To learn how to apply for Energy Commission R&D funding opportunities please see: http://www.energy.ca.gov/research/.

For additional information on the Natural Gas R&D Program, please see: http://www.energy.ca.gov/naturalgas_research/.

Written Comments

Comments should be submitted by **5:00 p.m. on Friday, August 24, 2018**. The Energy Commission encourages comments through the Energy Commission's docket system to Docket # 19-ERDD-01 (Research Idea Exchange). Please include your name and the name of the organization you represent. Comments should be in a downloadable, searchable format such as Microsoft® Word (.doc) or Adobe® Acrobat® (.pdf). Please include the title of the Request for Comments: Demonstrating Innovative Solutions to Convert California's Forest Biomass Resources into Renewable Natural Gas in the subject line.

If you prefer, you may send a paper copy of your comments to:

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1516 Ninth Street, MS-43
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Public Adviser and Other Commission Contacts

The Energy Commission's Public Adviser's Office provides the public assistance in participating in Energy Commission proceedings. If you want information on how to participate in this forum, please contact the Public Adviser, Alana Mathews, at PublicAdviser@energy.ca.gov or (916) 654-4489, or toll free at (800) 822-6228.

[4] See CPUC Decision 04-08-010, August 19, 2004, http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/39314.PDF.

[5] *Id.* at p. 46.

If you have a disability and require assistance to participate, please contact Poneh Jones at Poneh.Jones@energy.ca.gov or (916) 654-4425 at least five days in advance.

Media inquiries should be sent to the Media and Public Communications Office at mediaoffice@energy.ca.gov or (916) 654-4989.

If you have questions on the subject matter of this Request for Comments, please contact Kevin Uy at Kevin.Uy@energy.ca.gov or (916) 327-1533.

Mail Lists: opportunity, research, naturalgas