Request for Information on Renewable Propane Production Technologies and Uses

DATE: 7/9/2024
SUBJECT: Request for Information (RFI)

Description

The U.S. Department of Energy (DOE), Office of Energy Efficiency and Renewable Energy (EERE) Bioenergy Technologies Office (BETO) is requesting information and feedback on areas relating to activities in the Conversion Research & Development (R&D) Program. This RFI is focused on understanding the supply chains for production and uses of renewable propane and other renewable gaseous intermediates. Specifically, DOE would like to understand the potential for R&D to increase the viability of renewable propane to pursue new production pathways to sustainable aviation fuel and other high-impact products from municipal waste; agricultural residue; forest resources; and fats, oils, and greases.

Background

In the United States, propane consumption averages approximately 1 million barrels per day[1] and accounts for approximately 1% of total energy consumption.[2] The propane supply chain traditionally originates as natural gas processing byproduct or crude oil refining byproduct.

Recently, renewable propane has become a new byproduct or product in the biofuels sector. For example, in the hydroprocessing of biogenic fats, oils, and greases (including hydrotreated esters and fatty acids (HEFA)), propane is cleaved off the triglyceride with propane yields of 5% by weight. If the hydrocarbon is further hydrotreated severely to increase sustainable aviation fuel yield, there may be additional propane and other gaseous intermediates as well.[3]

Other methods of renewable propane and other renewable gaseous intermediates production, utilizing municipal waste, agricultural residue, and forest resources, may also be under

[1] U.S. Energy Information Administration, *Monthly Energy Review*, Tables 3.7A, B, and C, September 2023, available at https://www.eia.gov/energyexplained/hydrocarbon-gas-liquids/uses-of-hydrocarbon-gas-liquids-in-depth.php
[2] U.S. Department of Energy, Office of Cybersecurity, Energy Security, and Emergency Response: Learning Series: Energy Security & Resilience: How it Works: Propane Supply Chain, available at https://www.energy.gov/sites/default/files/2023-08/Propane%20Supply%20Chain%20Backgrounder_v3-Formatted_041723_508.pdf
[3] Baldwin, Robert M., Mark R. Nimlos, and Yimin Zhang, *Techno-Economic, Feasibility, and Life Cycle Analysis of Renewable Propane: Final Report*. Golden, CO: National Renewable Energy Laboratory. NREL/TP-2A00-83755, 2022, available at https://www.nrel.gov/docs/fy23osti/83755.pdf

This is a Request for Information (RFI) only. EERE will not pay for information provided under this RFI and no project will be supported as a result of this RFI. This RFI is not accepting applications for financial assistance or financial incentives. EERE may or may not issue a Funding Opportunity Announcement (FOA) based on consideration of the input received from this RFI.

consideration in the research and industry community. This RFI seeks to understand what technologies exist for near-term production of propane and other gaseous intermediates from these renewable feedstocks.

Purpose

The purpose of this RFI is to solicit feedback from industrial entities that currently produce, or are considering producing, renewable propane and other renewable gaseous intermediates. EERE is specifically interested in information on the costs and benefits to a refinery that hydroprocesses biogenic fats, oils, and greases of utilizing renewable propane produced *in situ* as process energy compared to separation and recovery of the renewable propane for sale externally in the propane market. This is solely a request for information and not a Funding Opportunity Announcement (FOA). EERE is not accepting applications.

Disclaimer and Important Notes

This RFI is not a Funding Opportunity Announcement (FOA); therefore, EERE is not accepting applications at this time. EERE may issue a FOA in the future based on or related to the content and responses to this RFI; however, EERE may also elect not to issue a FOA. There is no guarantee that a FOA will be issued as a result of this RFI. Responding to this RFI does not provide any advantage or disadvantage to potential applicants if EERE chooses to issue a FOA regarding the subject matter. Final details, including the anticipated award size, quantity, and timing of EERE funded awards, will be subject to Congressional appropriations and direction.

Any information obtained as a result of this RFI is intended to be used by the Government on a non-attribution basis for planning and strategy development; this RFI does not constitute a formal solicitation for proposals or abstracts. Your response to this notice will be treated as information only. EERE will review and consider all responses in its formulation of program strategies for the identified materials of interest that are the subject of this request. EERE will not provide reimbursement for costs incurred in responding to this RFI. Respondents are advised that EERE is under no obligation to acknowledge receipt of the information received or provide feedback to respondents with respect to any information submitted under this RFI. Responses to this RFI do not bind EERE to any further actions related to this topic.

Confidential Business Information

Pursuant to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit via email, postal mail, or hand delivery two well-marked copies: one copy of the document marked “confidential” including all the information believed to be confidential, and one copy of the document marked “non-confidential” with the information believed to be confidential deleted. Submit these

---

This is a Request for Information (RFI) only. EERE will not pay for information provided under this RFI and no project will be supported as a result of this RFI. This RFI is not accepting applications for financial assistance or financial incentives. EERE may or may not issue a Funding Opportunity Announcement (FOA) based on consideration of the input received from this RFI.

documents via email or on a CD, if feasible. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

Evaluation and Administration by Federal and Non-Federal Personnel

Federal employees are subject to the non-disclosure requirements of a criminal statute, the Trade Secrets Act, 18 USC 1905. The Government may seek the advice of qualified non-Federal personnel. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The respondents, by submitting their response, consent to EERE providing their response to non-Federal parties. Non-Federal parties given access to responses must be subject to an appropriate obligation of confidentiality prior to being given the access. Submissions may be reviewed by support contractors and private consultants.

Request for Information Categories and Questions

Category 1: The following questions pertain to the production of propane and other gaseous intermediates from the hydroprocessing of biogenic fats, oils, and greases. The term "renewable propane and other renewable gaseous intermediates" below is used to refer to such production.

1. What process are you currently using to produce renewable propane and other renewable gaseous intermediates? Please explain.
2. If you are considering producing or increasing your production of renewable propane and other renewable gaseous intermediates, please explain why.
3. If you are not considering producing or increasing your production of renewable propane and other renewable gaseous intermediates, please explain why you are not.
4. If you are currently producing renewable propane and other renewable gaseous intermediates, what are your management practices for recovering the renewable propane and other renewable gaseous intermediates?
5. How do you currently utilize any recovered renewable propane and other renewable gaseous intermediates? E.g. reformed on-site to make hydrogen; used on-site for heat and power; separated, stored, and sold; flared, etc.
6. What are the key factors (e.g. capital cost, operating cost, propane prices, incentives, logistics) that drive your decision(s) for your answer(s) to question #5 above?
7. What types of technology improvements do you think would address or change some of the key factors you identified in question #6 above? If so, how?
8. What scale makes sense for this type of system (e.g., separation and purification of all propane and other gaseous intermediates, separation and purification of a slipstream, etc.)?

This is a Request for Information (RFI) only. EERE will not pay for information provided under this RFI and no project will be supported as a result of this RFI. This RFI is not accepting applications for financial assistance or financial incentives. EERE may or may not issue a Funding Opportunity Announcement (FOA) based on consideration of the input received from this RFI.

9. If you currently are, or are considering, severe hydrotreating to increase sustainable aviation fuel production, are you seeing or do you expect to see additional propane and other gaseous intermediates yield? What do you plan to do with this additional propane and other gaseous intermediates product?

Category 2: The following questions pertain to the production of propane and other gaseous intermediates from municipal waste, agricultural residue, and forest residues. The term "renewable propane and other renewable gaseous intermediates" below is used to refer to such production.

1. What feedstocks and conversion technologies do you see as near-term (less than five years from commercialization) pathways to produce renewable propane or other renewable gaseous intermediates? What is the state of deployment and technology readiness level of this/these pathway(s)?
2. What are the technical challenges that remain for further developing these pathways?
3. What are the major drivers in your interest for new pathways to produce renewable propane and other renewable gaseous intermediates?

Request for Information Response Guidelines

Responses to this RFI must be submitted electronically to RenewablePropaneRFI@ee.doe.gov no later than 5:00pm (ET) on 8/5/2024. Responses must be provided as attachments to an email. It is recommended that attachments with file sizes exceeding 25MB be compressed (i.e., zipped) to ensure message delivery. Responses must be provided as a Microsoft Word (.docx) attachment to the email, and no more than 5 pages in length, 12-point font, 1 inch margins. Only electronic responses will be accepted.

Please identify your answers by responding to a specific question or topic if applicable. Respondents may answer as many or as few questions as they wish.

EERE will not respond to individual submissions or publish publicly a compendium of responses. A response to this RFI will not be viewed as a binding commitment to develop or pursue the project or ideas discussed.

Respondents are requested to provide the following information at the start of their response to this RFI:

- Company / institution name;
- Company / institution contact;
- Contact's address, phone number, and e-mail address.

This is a Request for Information (RFI) only. EERE will not pay for information provided under this RFI and no project will be supported as a result of this RFI. This RFI is not accepting applications for financial assistance or financial incentives. EERE may or may not issue a Funding Opportunity Announcement (FOA) based on consideration of the input received from this RFI.