DE-FOA-0003157 - Sustainable Aviation Fuel (SAF) Grand Challenge: Building Supply Chains

DATE: September 21, 2023 Amended November 1, 2023
SUBJECT: Request for Information (RFI)

Description

The Sustainable Aviation Fuel (SAF) Grand Challenge[1] is a U.S. government-wide approach to work with industry to reduce cost, enhance sustainability, and expand production of sustainable aviation fuel. The goals of the SAF Grand Challenge are to (a) achieve production of 3 billion gallons per year of domestic sustainable aviation fuel with a minimum 50% reduction in life cycle greenhouse gas emissions (GHG) compared to conventional fuel by 2030, and (b) produce sufficient sustainable aviation jet fuel to meet 100% of projected jet fuel use, or 35 billion gallons of annual domestic production, by 2050. An interagency team led by the Department of Energy (DOE), the Department of Transportation (DOT), and the United States Department of Agriculture (USDA) worked with the Environmental Protection Agency (EPA); other government agencies; stakeholders from National Laboratories, universities, nongovernmental organizations (NGOs); and the aviation, agricultural, and energy industries to develop a SAF Grand Challenge Roadmap.[2] This roadmap outlines a whole-of-government approach, with coordinated policies and specific activities, that should be undertaken by federal agencies to support achievement of both the 2030 and 2050 SAF Grand Challenge goals.

A key action area in the SAF Grand Challenge Roadmap is building supply chains to meet the SAF Grand Challenge goals. The purpose of this RFI is to engage with stakeholders on the "Building Supply Chains" action area of the SAF Grand Challenge, understand the challenges facing critical elements within the SAF supply chain, and to identify opportunities to enable the rapid development of effective supply chains capable of meeting future SAF demand.

Background

The aviation sector is an important contributor to the American economy and a significant source of GHG emissions. Aviation generates approximately 2% of U.S. human-made carbon dioxide (CO2) emissions and contributes additional global warming impacts through high-altitude nitrogen oxide emissions and aviation-induced cloudiness. U.S. commercial aviation currently consumes approximately 10% of U.S. transportation energy. Aviation drives about 6% of the U.S. gross domestic product and just under 7% of national employment. The 2019 jet fuel

[1] https://biomassboard.gov/sustainable-aviation-fuel-grand-challenge
[2] https://biomassboard.gov/sustainable-aviation-fuel-grand-challenge-roadmap

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uplift[3] in the United States was approximately 23 billion gallons and is expected to grow to about 35 billion gallons by 2050.

In September 2021, DOE, DOT, and USDA launched the government-wide SAF Grand Challenge to meet growing demand for sustainable aviation fuels by working with stakeholders to reduce costs, enhance sustainability, and expand production and use of SAF. SAF is defined as drop-in fuel from wastes, renewable materials, and gaseous sources of carbon that achieves a reduction in life cycle GHG emissions compared to conventional fuel. The SAF Grand Challenge adopted the goals of supplying at least 3 billion gallons of SAF per year by 2030 and sufficient SAF to meet 100% of aviation fuel demand by 2050, which is projected to be around 35 billion gallons annually. The SAF Grand Challenge affirmed to stakeholders that the U.S. government, across multiple agencies, is committed to SAF research, development, demonstration, and deployment (RDD&D).

The SAF Grand Challenge Roadmap provides an outline of actions by U.S. government agencies to support stakeholders in realizing the goals set forth in the SAF Grand Challenge. Under the roadmap, federal government agencies will collaborate and coordinate with the aviation industry, fuel producers, agriculture, research, academia, state/local/tribal governments, and others to accelerate growth of a domestic SAF industry that utilizes U.S. manufacturing capacities and the U.S. workforce, contributes to U.S. energy security, aids economic growth in rural America, and supports a just transition to a low-carbon aviation future. This roadmap has and will continue to incorporate input from key stakeholders to ensure alignment of government and industry actions and coordination of government policies.

Purpose

The purpose of this RFI is to solicit feedback from industry, academia, research laboratories, government agencies, and other stakeholders on issues related to a key action area of the SAF Grand Challenge Roadmap, Building Supply Chains.[4] The "Building Supply Chains" action area encompasses feedstock production, collection, and distribution to SAF production facilities; conversion of feedstock to fuel; and transport of finished fuel to the infrastructure required to fuel aircraft. Because current fuel certifications require SAF to be blended with conventional fuels, the SAF supply chain also requires coordination with conventional jet fuel producers. Because SAF production is a nascent industry, SAF supply chains are immature, may be regionally unique, and will likely require significant resources and investment to establish. This action area will support SAF production expansion through R&D transitions from pilot- to large-

[3] Refers to fuel loaded onto aircraft at U.S. airports for all domestic flights (including general aviation, cargo, and passenger operations) and all international departures (including U.S. and foreign operators).
[4] SAF Grand Challenge Roadmap: Building Supply Chains Action Area | Biomass Research & Development (biomassboard.gov) https://biomassboard.gov/saf-grand-challenge-roadmap-building-supply-chains-action-area.

scale, demonstration projects to validate supply chain logistics and business models, and public–private partnerships and collaboration with regional, state, and local stakeholders.

Achieving the SAF Grand Challenge objectives for SAF production by 2030 and beyond will require rapid development of effective supply chains capable of meeting future SAF demand. The following key actions support the development of SAF supply chains to further SAF supply expansion:

- **Convene regional stakeholder coalitions** to lead the exploration and development of SAF supply chains and provide outreach, extension, and education supporting SAF supply chain growth.
- **Develop and disseminate comprehensive data, analysis, and modeling tools** as a foundation for the development of low-GHG, cost-effective deployment of feedstock to fueling supply chains, SAF manufacturing, and logistics solutions.
- **Support feedstock-to-fueling demonstration projects** to de-risk and mature key elements in the supply chain from feedstock through airport distribution.
- **Invest in commercial-scale SAF production infrastructure and facility development** with existing and new public–private partnerships to expand domestic SAF supply.

Regional stakeholder coalitions will provide important recommendations to advance deployment, attract investment, advocate for policy change, support workforce development, and identify solutions to deployment barriers and risks. It is necessary to understand not only how to form effective SAF supply chain coalitions, but also to identify what is needed to accelerate the efforts and impacts of newly established coalitions.

These stakeholder coalitions will benefit greatly from access to critical data and tools that empower rapid, informed decision-making when evaluating SAF supply chain options. Such data and tools will especially include data and information related to feedstock availability, policy incentives, existing fuel infrastructure, fuel infrastructure siting, process economics, permitting requirements, and process technology. Establishing a comprehensive inventory of data resources, modeling, and simulation tools, as well as continuing to develop and evolve these resources, will be critical to the success of emerging SAF supply chains. It is necessary to understand which resources and tools can most effectively be utilized by participants along the supply chain to enable progress and make impactful steps towards a mature, functional SAF supply chain.

The demonstration of these new SAF supply chains in conjunction with the operation of fully integrated demonstration scale biorefineries will also provide plant operators, equipment manufacturers, technology vendors, and engineering/design firms with the data necessary to

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de-risk key areas in operations and infrastructure. Identifying and overcoming the critical gaps associated with demonstration of supply chain elements will help avoid costly changes at the commercial scale and reduce the risk of process upsets and failures in the biorefinery and along the supply chain.

These SAF supply chains encompass an extremely complicated system of systems, including feedstock production, collection, and distribution to SAF production facilities; construction or retrofitting of SAF production facilities including outfitting facilities with all necessary equipment; conversion of feedstock to fuel; and transport, storage, and delivery of the finished fuel to the infrastructure required to fuel aircraft. For these complex systems it is critical to identify significant barriers to scaling and commercial build out of SAF supply chain elements and to understand how these barriers should be addressed.

EERE is specifically interested in information on how to accelerate the formation of effective supply chain coalitions, develop effective decision-making modeling and simulation tools to enable supply chain development, demonstrate technologies and production along the supply chain, and facilitate investment in commercial scale supply chain elements. 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.

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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 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 Questions

1. Are you aware of effective regional supply chain coalitions that have been formed for renewable fuels?
    a. **If yes**, what factors contributed to the successful establishment of those coalitions, what challenges have they faced in their development and operation, and how can SAF stakeholders best apply these learnings to accelerate the development of their own coalitions across the United States?
    b. **If no**, how can effective SAF supply chain coalitions be formed and what is needed to accelerate their efforts to supply SAF to regions across the United States?
2. What modeling and simulation tools would enable participants along SAF supply chains to be more effective at maturing functional, integrated supply chains?
3. What are the most critical gaps in demonstration (pre commercial validation) of supply chain elements and how can these be overcome?
4. What are the most significant barriers to scaling and commercial build out of SAF supply chain elements and how should these be addressed?

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5. Is there a beneficial role that DOE and other U.S. Government agencies could serve in informing potential SAF producers about the wide range of potential investors and financial contractual structures in the SAF ecosystem? **If yes**, please describe what types of additional resources and activities the DOE and other U.S. Government agencies could provide to help advance SAF goals.

Request for Information Response Guidelines

Responses to this RFI must be submitted electronically to SAFSupplyChainRFI@ee.doe.gov no later than 5:00pm (ET) on November 17, 2023. 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 10 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.

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