

Bipartisan Policy Center Response to Request for Information on Sustainable Aviation Fuel (SAF) Grand Challenge: Building Supply Chains

TO: Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy

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

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Summary

The Bipartisan Policy Center is writing in response to the Department's request for information on Sustainable Aviation Fuel (SAF) supply chains. The development of robust and sustainable SAF supply chains is of paramount importance to meeting the United States SAF Grand Challenge. To address the most significant barriers to scaling and commercial build out of SAF supply chain, BPC recommends the following:

1. Harness Regional Biomass Research Centers for Enhanced Biomass Supply Chain Support.
2. Increase Support for Biomass Feedstock beyond First Generation.
3. Institute Financial Support Mechanisms for Biomass Feedstock Producers.
4. Alleviate Regulatory Barriers for Biomass Access from Public Lands.
5. Advance a Comprehensive Strategy for Non-biogenic Aviation Fuels or E-fuels.
6. Bridge the Demonstration Gap.
7. Cultivate Market Certainty and Mitigate Regulatory Uncertainty.
8. Establish Consistent Carbon Accounting Metrics and Standards.

Q4. What are the most significant barriers to scaling and commercial build out of SAF supply chain elements and how should these be addressed?

1. Harness Regional Biomass Research Centers for Enhanced Biomass Supply Chain Support:

The Billion Ton Studies (2011, 2016, upcoming 2023) underscore the abundance of near-term, economically viable, and technically feasible biomass resources in the U.S. Conducting more regionalized assessments can yield deeper insights and facilitate coordinated efforts to develop essential infrastructure and interventions for establishing robust, region-specific biomass supply chains. The existing Regional Biomass Research Centers (RBRC) initiative by the U.S. Department of Agriculture (USDA) serves as a valuable platform for regional biomass

research and supply chain development. USDA and the Department of Energy (DOE) can broaden the RBRCs' focus beyond biorefining and biobased products, incorporating support for the establishment of biomass supply chain networks catering to sustainable aviation fuel (SAF) and other biomass-based solutions. DOE's Regional Carbon Sequestration Partnership program can serve as an example of success in the regional development of carbon storage in different regions.¹ Similarly, RBRCs can utilize regional educational institutions and local industries to optimize local biomass resources, promote place-based innovation and strengthen regional economies.

- 2. Increase Support for Biomass Feedstock beyond First Generation:** In addition to first generation feedstocks, second generation feedstocks, such as waste residue, agricultural waste, algae, and energy crops, must be considered when determining how to support feedstock production. These non-edible sources offer significant advantages, such as avoiding or minimizing direct and indirect land use concerns, while yielding additional co-benefits like reduced water and fertilizer usage and enhanced soil organic carbon content.² Increasing support for research, development, demonstration, and deployment of second and third-generation biomass sources using existing policies and programs at the DOE and USDA will be valuable.
- 3. Institute Financial Support Mechanisms for Biomass Feedstock Producers:** Our examination of the biomass supply chain and prevailing policies highlights a crucial necessity for policy and program support during the early stages of feedstock production, spanning establishment, collection/harvest, distribution, and conversion phases. Feedstock collectors, growers and producers commonly encounter a profitability gap (up to 5 years) while establishing feedstock production and the corresponding supply chain infrastructure to connect with processing facilities or off-takers. Conventional agricultural financial institutions often lack a comprehensive understanding of risk management during this transitional period. Therefore, it is critical to address this financial challenge for the development of robust biomass supply chains.
- 4. Alleviate Regulatory Barriers for Biomass Access from Public Lands:** Forest biomass, encompassing residues remaining after harvesting forest products, fuelwood from forestlands, residues from forest products processing mills, and residues from silvicultural treatments designed to reduce hazardous fuel and enhance forest health, represent an

¹ <https://netl.doe.gov/carbon-management/carbon-storage/RCSP>

² <https://www.carbon-direct.com/insights/a-primer-on-the-future-of-sustainable-aviation-fuel>

underutilized resource. Existing regulatory constraints inhibiting forest biomass removal from public land, many of which are outlined in U.S. Forest Service’s own report, create unnecessary hurdles in establishing an effective supply chain.³ Collaborative efforts between USDA, DOE, USFS and other federal and management agencies is needed to dismantle these barriers and establish biomass supply chains from public lands.

5. **Advance a Comprehensive Strategy for Non-biogenic Aviation Fuels or E-fuels:** While the DOE, USDA, and Department of Transportation have predominantly centered their efforts on biomass feedstocks and biofuels as primary SAF solutions, it is paramount to acknowledge the significant potential of non-biogenic alternatives such as e-fuels or synthetic fuels. To ensure the development, scaling, and commercialization of these innovative fuels, a well-defined strategic plan and a coordinated, multi-agency approach are imperative. DOE can play a pivotal role in establishing the necessary supply chain infrastructure for e-fuels.
6. **Bridge the Demonstration Gap:** DOE has a long history of research and development on low technology development level solutions. As technologies mature, pilot and demonstration-scale studies become important for scale-up. Currently, investment in demonstration projects lags significantly behind other similar technology development efforts at DOE. Some technologies like gasification are critical for processing heterogenous biomass feedstock sources and need to be demonstrated at scale. The United Kingdom can serve as a great example in this case as it continues to invest in a portfolio of biomass development, integration, demonstration projects.⁴ Transitioning technologies from the lab-scale to demonstration-scale is a key barrier that needs to be addressed to expand the SAF supply chain.⁵
7. **Cultivate Market Certainty and Mitigate Regulatory Uncertainty:** The absence of demand certainty for SAF at a price capable of recovering investments is a critical challenge. This uncertainty impedes SAF producers from committing to building the necessary supply chain and feedstock production networks. Demand-support mechanisms and regulatory signals that enable long-term commitment are critical to cost competitive SAF supply. Federal incentives, like the Inflation Reduction Act (IRA) SAF tax credit, hold a pivotal role in incentivizing SAF investment. These incentives not only offer essential financial support but also instill confidence for both producers and buyers, enhancing the appeal of investments in

³ https://www.fs.usda.gov/rm/pubs_journals/2022/rmrs_2022_page_dumroese_d001.pdf

⁴ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1178897/bio-mass-strategy-2023.pdf

⁵ <https://bipartisanpolicy.org/report/innovation-at-scale/>

new SAF capacity and infrastructure. Several of these incentives are set to expire within the year, with no guarantees of extensions or replacements, hindering long-term investments including in the feedstock supply chain. Legislative proposals that extend the SAF tax credit and provide complementary grant, loan and loan guarantee programs are needed to underpin emergent SAF markets. Recognizing the potential challenges for the private sector in establishing a SAF supply chain, the federal government can also leverage its influence as a substantial buyer. Federal procurement initiatives have the potential to play a pivotal role as significant buyers in driving the development and sustainability of the SAF supply chain.⁶

8. **Establish Consistent Carbon Accounting Metrics and Standards:** The selection of different models for calculating lifecycle greenhouse gas (GHG) emissions can have significant impacts on the value of incentives and investment decisions in the SAF market. Lack of consistent standards, differences in model estimation regarding emissions from land use change, absence of clear governance structures can affect the value of incentives and credibility of the metrics and tools employed. Therefore, it is important to establish reliable, consistent, and precise methodologies for the measurement and reporting of GHG emissions to support a sustainable SAF supply chain.

⁶ <https://www.gao.gov/assets/gao-23-105300.pdf>