# Sustainable Aviation Fuel
## Grand Challenge
## Roadmap Implementation Update

April 9, 2024

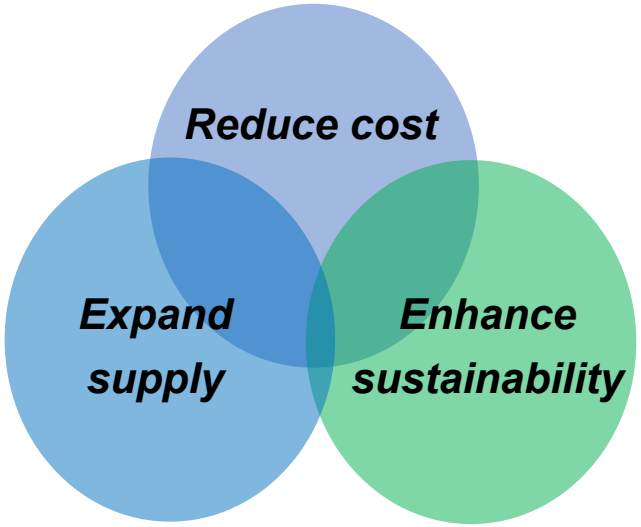
*To enable the production of 3 billion gallons of SAF per year by 2030 and 35 billion gallons by 2050*

# The SAF Grand Challenge

MEMORANDUM OF UNDERSTANDING
SUSTAINABLE AVIATION FUEL GRAND CHALLENGE

Among the
THE U.S. DEPARTMENT OF ENERGY,
THE U.S. DEPARTMENT OF TRANSPORTATION and the
THE U.S. DEPARTMENT OF AGRICULTURE

September 9, 2021



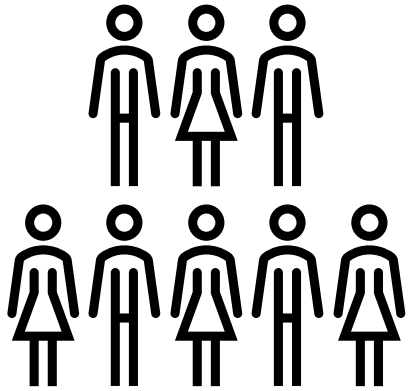

https://www.energy.gov/sites/default/files/2021-09/S1-Signed-SAF-MOU-9-08-21_0.pdf

# Roadmap Structure

- Feedstock Innovation
- Conversion Technology Innovation
- Building Supply Chains
- Policy and Valuation Analysis
- Enabling End Use
- Communicating Progress and Building Support


- **26 Workstreams**
- **140 Activities**
- **2030 & 2030-2050 impact timeframes**

# SAF GC Roadmap Implementation Framework



Soon to be published

Many Federal Agencies,  One Aggressive Goal

- Inventory and map current federal agency capabilities and programs to the actions called out in the roadmap.
- Identify gaps in currently funded programs

# SAF GC Roadmap Implementation Framework

- **Need for certainty in USG policy support is a key barrier to build-out of SAF supply chains.**
- **Expanded data and analysis and improved models are needed to perform transparent and credible SAF supply chain analysis to inform business models and policy development.**
- **Expanded purpose grown feedstocks and tapping the potential of waste and residual feedstocks will be critical to meeting the SAF GC production goals.**
- **Economically viable and sustainable feedstock supply chains need to be developed.**
- **Rapid scale-up and deployment requires utilizing existing ethanol and petroleum industry assets and infrastructure.**
- **Risk reduction and coalition building will be critical in scaling up SAF supply chains.**
- **Transparent and effective communication of SAF GC progress and benefits is tantamount to achieving the SAF GC goals.**

# Policy Support

PROGRESS: IRA 40B/45Z Tax Incentive, growing number of states with LCFS Incentives

NEEDS:

- Supportive and durable policies demonstrate the near-, medium-, and long-term commitment of the U.S. government to U.S. production and use of SAF can play a key role in catalyzing effective private investment in SAF projects.
- U.S. and international policies must align to ensure that domestically produced SAF will be useful for airlines serving international markets
- Continuous commitment to improving data collection, model development, analyses, and verification and tracking programs to ensure that the availability and use of SAF continues to grow

# SAF Supply Chains

PROGRESS

- USDA **funded over $210M** Partnership for Climate Smart Commodities/ Sustainable Agricultural Systems
- USDA **published Building a Resilient Biomass Supply Plan and Implementation Framework** as part of Executive Order 14801
- DOE **published Billion Ton Report** to update renewable carbon resource assessments to underpin key economic, life cycle and SAF production potential (DOE)
- DOE announced **Clean Fuels and Chemicals Earthshot**

NEEDS

- Data and analysis to
  - quantify, validate, and appropriately credit the environmental impacts and ecosystem co-benefits of SAF supply chains from feedstock production (e.g., soil health, soil organic carbon sequestration, water quality, nutrient management) to end use (e.g., contrails).
  - to understand and validate the ecosystem impacts of induced land use change.

# Access/Improving Quality of Purpose Grown Feedstocks and Utilizing Waste Feedstocks

PROGRESS

- DOE **$15M Upgrade** to the Biomass Feedstock National User Facility at INL
- DOE **Announced $29M** to establish Regional Resource Hubs for Purpose Grown Energy Crops
- USDA **Announced $80M** Agriculture and Food Research Initiative - Sustainable Agricultural Systems
- USDA Released ARS Crop Production and Protection 10-year strategic plan for the U.S. National Plant Germplasm System including genetic resources used to improve many crops used as feedstocks for SAF.

NEED

- Better policy analysis, better understanding
  - waste and residual aggregation and collection
  - expansion of wood biomass use and incentives,
  - long-term biomass crop production
- Need to ensure an adequate supply of affordable lipids (vegetable oils, fats, oils, and greases) at scale and address competing markets for lipids. Build out harvestable oilseed cover crops.

# Rapid Scale up and Utilizing Existing Ethanol and Petroleum Industry Assets

PROGRESS

- DOE **Awarded $10M** for four existing ethanol facilities funding to reduce carbon intensity scores
- USDA's Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program (9003 program) graduate Fulcrum, LanzaJet and **support 7 additional projects in 7 different states**
- DOE **Awarded $182M for 39 projects** across pre-pilot, pilot and demonstration scales.
- FAA **Announced FAA-FAST $245 million** to advance the deployment of jet fuels made from renewable sources,

NEED

- Continue reducing the carbon intensity of ethanol
  - Applying climate-smart agriculture to reduce the carbon intensity of starch-based ethanol.
  - Renewed and expanded effort to develop low-CI sugar feedstocks from celullosics.
- RD&D on the compatibility of existing petroleum hydrotreaters and infrastructure assets with emerging bio-intermediates like bio-oils.
- RD&D to adapt catalysts to new seed oils

# Thank You

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