U.S. Chamber of Commerce

Market and Policy Landscape

Introduction

Sustainable Aviation Fuel (SAF) development in the U.S. is entering a pivotal phase. While federal policy support, private investment, and commitments from airlines have built momentum, SAF remains at a nascent stage of commercial readiness and is significantly more expensive to produce —roughly two to four times the cost compared to conventional jet fuel.

To overcome the premium for SAF, airlines throughout the U.S. have made offtake commitments to drive demand and increase the financial viability to expand production capacity. Representative commitments to date include the following:

2.9-BILLION-GALLON
long-term commitment
United Airlines

10% SAF PROCUREMENT GOAL
by the end of 2030
Delta Airlines

620 MILLION GALLONS
offtake by 2030
American Airlines

1 MILLION GALLONS
per year at JFK airport
Jetblue

SAF producers have announced $44 billion of investments to expand domestic capacity, which would exceed federal production targets if completed.

This document provides a current landscape of the U.S. market and provides suggestions for potential supportive policies that can help achieve scale.

SAF 101

SAF is an alternative fuel made from renewable and waste resources, including agricultural and forestry residue; organic municipal solid waste; fats, oils, and greases from cooking waste and meat production; algae; and captured waste gases.

By using these feedstocks instead of conventional petroleum to produce jet fuel, the aviation sector can reduce its emissions and lower its carbon intensity — enhancing the industry's global competitiveness.

While there are 11 ASTM-certified SAF production pathways, only 2 are the most commonly used in producing commercial quantities today:

Hydroprocessed Esters and Fatty Acids (HEFA)

SAF is produced by removing oxygen from agricultural products and wastes and replacing it with hydrogen. HEFA is the most commercially mature process and can reduce SAF emissions by 85% compared to conventional jet fuel.

Co-processing of HEFA feedstocks

Using the same feedstocks and technologies as in the stand-alone HEFA pathway, these feedstocks are co-produced with petroleum in a conventional refinery, with similar emissions reduction benefits.

Other pathways of note are in varying stages of development and maturity and could expand the base of feedstocks used in future SAF production:

Alcohol-to-Jet (AtJ)

SAF is produced from ethanol sourced from corn, sugarcane, or other feedstocks, which is fermented into sugars and converted to SAF. AtJ is approaching its first commercial scale production and can reduce SAF emissions significantly compared to conventional jet fuel.

Gasification with Fischer-Tropsch (Gas-FT):

A wide variety of biomass waste and residual feedstocks from forestry, agriculture, or municipal sources can be gasified and then catalytically converted and refined into SAF. Several projects are in various states of project development.

Power-to-Liquid (PtL)

SAF is produced by synthesizing industrial point source or direct air captured CO_2 with electrolytic and other types of hydrogen. PtL is in the development phase and has the potential to reduce SAF emissions dramatically.

Federal Policy Overview

Through the SAF Grand Challenge, the federal government has set a 3-billion-gallon-per- year SAF target to expand domestic SAF production and use by 2030. To support this goal, policymakers have implemented a comprehensive policy framework to support SAF producers to champion supply growth, drive demand, and better coordinate agencies across the federal government. While the transition to a second Trump administration has seen the SAF policy framework evolve to align with a new energy agenda, the additional policy supports like the Grand Challenge and its related Roadmap, and grants and loan guarantees have been maintained.

Since returning to office, President Trump has advanced an expansive Energy Dominance agenda, which includes the following core tenets:

- Expand domestic fossil fuel production (e.g., oil, gas, coal).
- Increase energy exports to influence global energy markets.
- Roll back environmental and climate regulations that were seen as barriers to production.
- Reduce federal control over energy development on public lands and waters.
- Prioritize energy “independence” and “security” over decarbonization or climate goals.

Under several executive orders, the administration has identified oil, natural gas, coal, hydropower, biofuels, critical minerals, and nuclear energy resources as the energy solutions it will prioritize. Agencies across the federal government were also ordered to initiate reviews of Biden-era climate and clean energy programs, which resulted in program terminations, personnel cuts, and cancellation of grants and projects.

The administration’s energy agenda was reinforced by the passage of the One Big Beautiful Bill Act (OBBBA), which made significant changes to the energy tax credits passed under the Inflation Reduction Act (IRA). To limit federal funds from benefiting adversarial energy industries abroad, Congress imposed strict Foreign Entities of Concern (FEOC) requirements to be eligible for the IRA tax credits.

Despite significant shifts in federal energy priorities, support for SAF and biofuels has been largely maintained through the extension of the Section 45Z Clean Fuel Production Tax Credit, preservation of multibillion-dollar loan guarantees under the Department of Energy (DOE), and support for the Renewable Fuel Standard (RFS). Coordinated executive actions further demonstrate the level of federal commitment to SAF development. States have also built off the momentum of the federal government support for SAF and have adopted new state-level tax incentives and programs to help encourage targeted state and regional investment and production capacity.

Supply-Push: Tax, Grants, and Loans

Section 45Z Clean Fuel Production Tax Credit

In 2022, Congress established the three-year Section 45Z Clean Fuel Production Tax Credit to incentivize the buildout of SAF capacity and other biofuels as a successor credit to the long-standing 40A and the newly established 40B Blenders Tax Credits. Notably, under the SAF-specific 40B credit (2023-2024), SAF with a minimum 50 percent reduction in lifecycle GHG emissions was eligible for a base credit of $1.25, up to $1.75; while under the 40A credit, biodiesel and renewable diesel projects were eligible for a flat $1.00 credit. With the transition to the fuel neutral 45Z credit, policy support was enhanced to also capture ethanol and qualifying SAF facilities could claim up to $1.75 per gallon of SAF produced, with the value of the credit starting at a roughly near zero value for SAF based on lifecycle carbon-intensity reductions and an emissions factor that prioritizes lower carbon intensity fuels including many not yet commercially available.

In 2025, under the OBBBA, Congress extended the duration of the 45Z credit for an additional two years through December 31, 2029. In addition, eligible facilities will have to source production feedstocks from the U.S., Canada, and Mexico to receive the credit. Congress also reduced the credit's maximum value for SAF to $1.00 per gallon—on par with already established on-road fuels, a change that created an uneven playing field for this nascent fuel. Indirect land use change (ILUC) emissions are excluded from consideration as well and changes were made prohibiting eligible fuels from being used as a feedstock will impact how ethanol may claim the credit.

While the extension of the 45Z credit for an additional two years will provide a four-year runway with some certainty for project developers, the reduction of the credit's value impairs the affordability of SAF procurements and could diminish the economic case for SAF investment. The changes affecting ethanol producers also make it more challenging for the AtJ pathway unless a producer is vertically integrated and they do not take into account the higher cost nor increase in emissions associated with processing ethanol into SAF. Additionally, limitations on feedstocks produced outside of North America and the exclusion of ILUC requirements will complicate U.S. producers' ability to access the global renewable fuels market. Some developers could explore the use of other federal tax incentives, like the 45V Clean Hydrogen Production Tax Credit or the 45Q Carbon Oxide Sequestration Tax Credit.

These changes bolster the need for state-level policy support to supplement federal support as a key driver for long term SAF investment across the United States. (See Appendix A.)

Federal Grants and Loan Programs

Federal agencies have continued to support SAF development through grant programs and loan guarantees.

In February 2025, the DOE closed a $1.44 billion loan guarantee for Montana Renewables' MaxSAF project, enabling a 300-million-gallon-per-year biorefinery expansion. At the same time, the DOE's Bioenergy Technologies Office committed up to $23 million in R&D funding to accelerate SAF feedstock and processing innovations—many of which directly benefit rural economies and agricultural producers.

The Department of Agriculture (USDA) and the Federal Aviation Administration (FAA) are also reinforcing SAF-related job growth in rural areas. The USDA's Rural Energy for America Program (REAP) has supported several bioenergy projects that produce SAF as a co-product, helping strengthen the economic viability of integrated biorefineries in agricultural regions. Moreover, the FAA Reauthorization Act allocated funding to build out SAF blending and storage infrastructure at airports, creating skilled labor opportunities while enabling fuel distribution across regional hubs.[1]

Congress could further bolster federal support for SAF through the reintroduced Farm to Fly Act, which would leverage existing USDA programs to promote SAF made from U.S. agricultural products. The act would support economic growth by creating new markets for American farmers and supporting job creation in rural communities. It also enhances U.S. energy security by reducing reliance on foreign oil and diversifying the nation's fuel supply with domestically sourced, renewable alternatives.

It is worth noting that the FAA FAST Grant was revoked in OBBBA even after the original grants for SAF infrastructure were already awarded.

[1] Note that OBBBA cut unspent SAF grant monies under the program.

Demand-Pull: Regulatory Mandates and Incentive Mechanisms

The Renewable Fuel Standard (RFS), administered by the EPA, continues to play a role in creating market certainty and economic incentives for SAF producers. Under the RFS, SAF qualifies as an "advanced biofuel," making it eligible for D5, Renewable Identification Numbers (RINs) and in some cases D4 RINs for biomass-based diesel. These credits provide an incremental revenue stream for SAF producers and signal long-term market demand, which helps attract investment and support new fuel production facilities.

To further accelerate SAF deployment, the EPA finalized updated lifecycle analysis methodologies in 2024 and 2025 that streamline the approval process for key SAF pathways, including those derived from waste oils and fats.

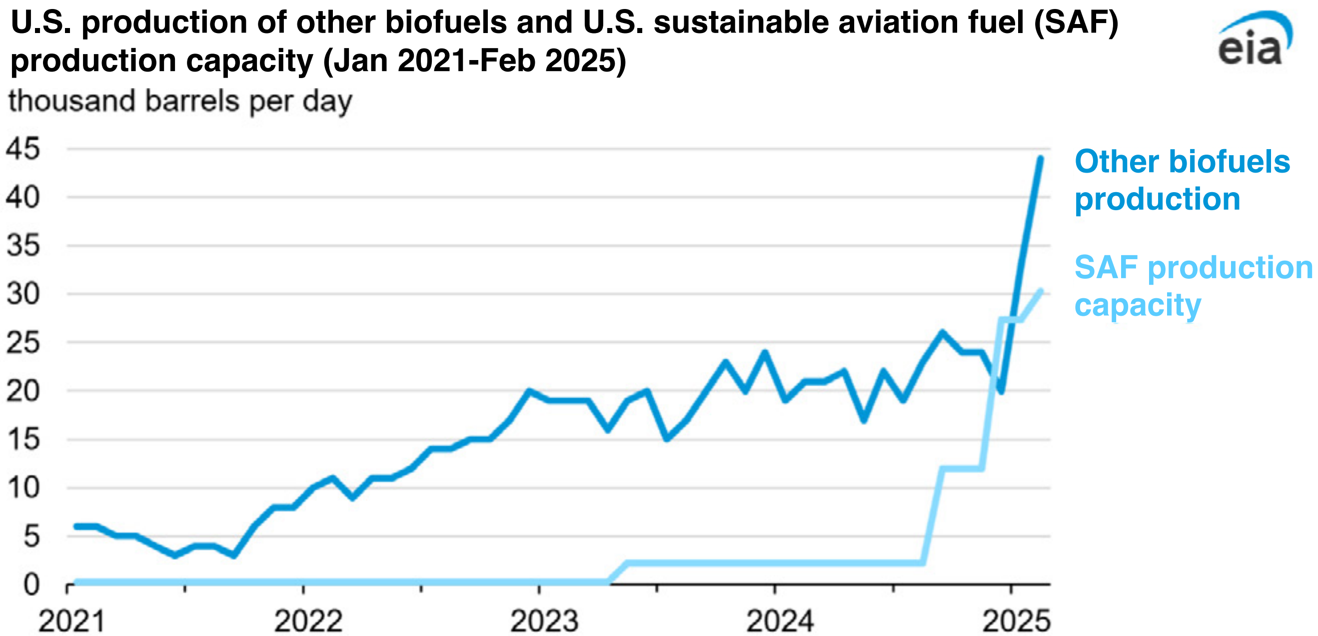
Coordination: Executive and Interagency Actions

In addition to support for private sector development of SAF, the federal government has strengthened interagency coordination to accelerate SAF deployment and unlock associated economic benefits. The Interagency SAF Coordinating Council—chaired by DOE and including USDA, DOT, EPA, DOD, and FAA—meets quarterly to align R&D priorities, streamline permitting, and coordinate federal investment.

Internationally, the FAA and the Department of Transportation's engagement at the International Civil Aviation Organization (ICAO) has secured recognition of U.S.-produced SAF under the CORSIA framework. This enables U.S. airlines to reduce their offsetting liabilities while expanding the global market for domestically produced SAF. Continued alignment of U.S. lifecycle assessment methods (e.g., GREET, EPA, CORSIA) will be essential to preserve international market access and ensure that U.S.-produced SAF can be used to meet global compliance and offsetting requirements.

U.S. Market Progress

According to the Energy Information Administration, SAF production capacity significantly increased from December 2024 to February 2025 to around 30,000 barrels per day (b/d) or 1.26 million gallons per day. This increase is due to new facilities operated by Phillips 66 and Diamond Green Diesel— with a combined 25,000 b/d—beginning operations.



SAF production capacity is expected to continue growing through 2030 and announced projects could surpass the DOE SAF Grand Challenge goal of 3-billion-gallon-per-year production by 2030 but will be subject to timely third-party financing and facility development. However, because of continuing SAF buyer affordability challenges, actual SAF production remains underutilized well below its potential capacity. Actual production and use are not on track to meet the shared airline and government goal of 3 billion gallons of affordable SAF available to U.S. operators. Additionally, post-OBBBA impacts to the market remain to be seen.

Global Opportunities and Challenges

Worldwide, aviation accounts for almost 3% of all carbon dioxide (CO_2) emissions, and 12% of all CO_2 emissions are from transportation. ICAO's CORSIA caps net CO_2 emissions for international aviation at 85% of 2019 levels through 2035. The global aviation industry, including pledges by U.S. airlines, has set an aspirational goal to reach net zero carbon by 2050. Beyond fleet modernization, air traffic modernization, and operational efficiencies, residual emissions reductions necessary to achieve net zero will require the commercialization and scaling of new technologies. Of those technologies, SAF is viewed as the most promising, as it is a drop-in solution that can be used with today's aircraft and fueling infrastructure.

CORSIA plays a central role in driving the global adoption of SAF. Under CORSIA, airlines can reduce their carbon offset obligations by using SAF that meets strict lifecycle emissions and sustainability criteria. A key mechanism for enabling greater SAF availability in the U.S. and globally is book-and-claim.[2] Book and claim allows the environmental benefits of SAF to be disaggregated from the SAF physical fuel, avoiding unnecessary costs and emissions of physically deploying quantities of SAF to every specific location where someone wants to obtain emissions. This allows airlines to concentrate on the customers with the highest willingness to pay the higher cost of SAF, even if they are decentralized in their flying. This system decouples the physical distribution of SAF from its environmental benefit, which provided greater flexibility for airlines operating in regions where SAF is not yet readily available.

Book-and-claim offers several strategic advantages. It enables broader global access to SAF markets, encourages investment by creating liquidity and flexibility in SAF credits, and supports emerging producers in regions with strong feedstock availability but limited infrastructure. It also helps airlines mitigate exposure to increased GHG policies like CORSIA by lowering carbon offsets and giving more in sector pathways to demonstrate emissions reductions. Ensuring the integrity of book-and-claim systems through systems such as registries—including airline-level attribution, third-party verification, and prevention of double counting—will be essential to maintain public confidence and climate credibility.

Within this global context, Brazil is well positioned to become a key player in SAF production. The country's abundant low-carbon feedstocks, such as sugarcane ethanol and macaúba oil, offer favorable lifecycle emissions that align well with ICAO/CORSIA criteria. Brazil is also rapidly expanding its corn grain production, with the intent to produce corn ethanol AtJ SAF to international markets in competition with U.S. producers. Brazil's policy landscape— like its forthcoming domestic SAF mandate—creates a strong foundation for both domestic use and export.

Similar to the U.S., Brazil will need to address challenges related to land use change, international sustainability verification, and certification system compatibility. With credible governance and international alignment, Brazil could emerge as a global hub for SAF under CORSIA and other national commitments, supporting both decarbonization goals and economic development.

[2] A4A-Position-SAF-Accounting-Book-and-Claim-Rev-April-2024-Final-R1.pdf

Trade and Tariffs Assessment

With global trade relations fluctuating due to the Trump administration's evolving trade relations and Congress' changes to the tax credits, SAF producers that are reliant on the global supply chain for SAF feedstocks will need to navigate a market with increasing complexity. Specifically, the Trump administration's tariffs could lead to the following impacts:

Feedstock Supply Chain Disruption and Price Uncertainty

Increase cost of imported feedstocks due to supply disruptions, reduced availability, and increased uncertainty.

Higher Costs for Critical Equipment and Infrastructure

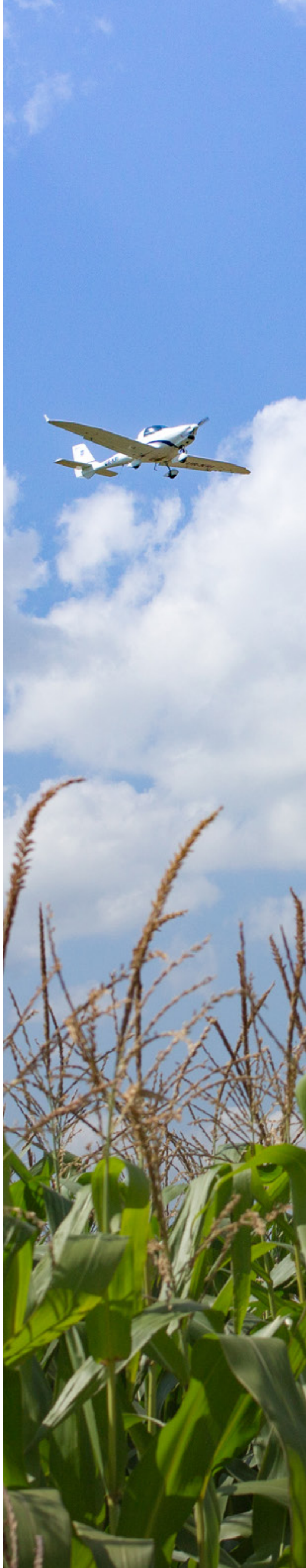
Increased costs for SAF production facilities and infrastructure (e.g., biorefineries, processing equipment, steel, aluminum).

Investor Confidence and Market Certainty

SAF development requires 10- to 20-year planning horizons; unpredictable tariff environments and the lack of a longer-term incentive structure complicate developers' ability to secure financing.

Retaliatory Tariffs Limiting SAF Export Potential

Countries affected by U.S. tariffs (e.g., China, EU, Brazil) could impose retaliatory tariffs on U.S. energy or fuel products, harming potential export markets for U.S.-produced SAF.



Barriers to Scale

- **Airline affordability:** Among renewable fuel buyers, airlines pay the largest premium after incentives by far for SAF compared to road transport fuel buyers of their respective fuels (e.g., ethanol, biodiesel, renewable diesel). This economic disadvantage significantly suppresses demand below its potential production capacity and is the result of incentive structures not fully accounting for the higher production cost of SAF.
- **Feedstock Supply and Competition:** Limited availability of low-carbon feedstocks (e.g., used cooking oil, animal fats) constrains medium-term combined SAF and renewable diesel production. Intense competition with renewable diesel often drives SAF price premiums. Emerging feedstocks (e.g., ethanol, waste biomass, green hydrogen, algae, intermediate oilseeds) face technical and scalability hurdles.
- **Regulatory Uncertainty and Delays:** Delays in the EPA fuel pathway approvals under the RFS limit access to RINs and stall projects. A short-time horizon of federal tax credits and delays in rulemaking and guidelines discourage investment. Misalignment between federal and state policies (e.g., RFS vs. LCFS, tax credit eligibility) adds compliance burdens. Evolving lifecycle and sustainability standards (e.g., EU RED, CORSIA, CA LCFS) increase investor uncertainty.
- **Global Trade and Standards Misalignment:** Tariffs and protectionist trade policies disrupt access to international feedstocks, raising costs. Regulatory misalignment across jurisdictions further complicates implementation, and over reliance on book-and-claim may slow the development of physical SAF infrastructure by allowing stakeholders to defer local supply investments.
  - U.S. feedstocks not aligned with global standards (e.g., EU RED, CORSIA) reduce export potential. Competitors like Brazil benefit from having globally accepted, low-carbon alternatives (e.g., sugarcane ethanol, macaúba oil, second crop corn ethanol).
- **Co-Processing Limitations:** Many refineries are only able to co-process 5%biogenic material by volume. Higher blends can cause fouling, catalyst poisoning, and corrosion issues in traditional refining units not designed for bio-feedstocks. Refiners need economies of scale to produce SAF fuels at existing facilities. Requiring separate refineries without investment or production support drives investment toward foreign production and makes project economics unworkable in the U.S. And co-processing is not universally eligible for SAF tax credits across U.S. federal and state jurisdictions.
- **High Production Costs:** SAF is currently 2x–4x more expensive than conventional jet fuel. Capital costs for first-of-a-kind biorefineries are high, especially for advanced pathways like alcohol-to-jet (ATJ) and gasification-Fischer–Tropsch (GFT). Market premiums or policy incentives (e.g., tax credits, RINs) often do not fully close the cost gap. Airlines are not committing to long-term offtake agreement, demand signals at substantial price premiums.
- **Infrastructure and Distribution Bottlenecks:** Pipelines are not yet configured for unblended SAF compatibility, requiring trucking or higher cost distribution of blended SAF. Last-mile delivery challenges create a chicken-and-egg problem for fuel availability at specific airports.
- **Uneven policy design:** Future policy frameworks should balance incentives between producers, suppliers, and end users to enable sustainable, competitive adoption.
- **Workforce and Technology Gaps:** A lack of skilled workers in advanced biomanufacturing, fuel logistics, and feedstock processing slows deployment. Many conversion technologies are still pre-commercial, requiring significant R&D and demonstration support.

Recommendations

- **Restore SAF-specific Incentives:** Restoring the SAF special value to 45Z, at a minimum, or reinstating the now expired 40B tax credit would provide a critical SAF-specific financial incentive. In the case of 40B, this would provide a base credit of $1.25 per-gallon if lifecycle GHG reductions reached 50% and an additional $0.50 if greater reductions are achieved. However, this would leave ethanol producers without a clear incentive structure, such as the one provided under the original Section 45Z credit. While the 45Z has shifted to a feedstock-neutral, carbon intensity-based model that fosters competition and innovation but introduces more complexity and dramatically less certainty for SAF-specific investments. This is compounded by the removal of the bonus credit for SAF production and the changes impacting the AtJ pathway further complicate the role of ethanol for SAF production. Additionally, the removal of ILUC undermines the environmental advantage of intermediate crops, reducing the market incentive and policy signal to scale additive rotational oilseeds. Regional and state-level incentives can complement federal incentives to address the key airline affordability problem.
- **Provide Feedstock Support:** Incentivizing climate smart agricultural practices and focusing on the development of an all of the above approach to sustainable, biobased feedstocks, such as those derived from waste streams, renewable energy sources, or biomass, and removing non-tariff barriers that prevent such access.
- **Eliminate Co-processing Limitations:** Prioritizing the development and deployment of advanced refining technologies and retrofitting existing infrastructure to handle higher volumes of biogenic feedstocks. This includes targeted funding for pilot projects, tax incentives for refinery upgrades, and streamlined permitting for domestic SAF facilities to avoid reliance on foreign production and ensure that U.S. refiners can achieve the economies of scale necessary for market competitiveness.
- **Enhance Book-and-Claim Harmonization:** Ensuring the harmonization of voluntary book-and-claim systems requires robust traceability, third-party verification, and safeguards against double-counting and will ensure the integrity of SAF.
- **Support Airport Infrastructure:** Expand federal grant and loan programs to fund SAF blending, storage, and distribution infrastructure at airports, ensuring that supply availability aligns with airline offtake commitments.
- **Continue Loan Guarantees and Financial Support:** Providing loan guarantees and other financial support, such as grants, can help SAF producers secure funding for infrastructure and production facilities. Enhancing the RIN value for SAF under the RFS could provide additional financial support for SAF, helping to shift refining economics in favor of enhanced production.
- **Research and Development:** Funding for research and development can accelerate the development of new SAF production technologies and pathways.
- **Robust Standards and Certification:** Establishing clear, harmonized, and rigorous standards, such as those developed by the ICAO and ASTM, while equitably treating U.S. agricultural feedstocks is crucial for ensuring that SAF meets environmental and market requirements.

Appendix

California's Low Carbon Fuel Standard (LCFS) helped establish a market-based framework for low-carbon fuels, including SAF, through an opt-in crediting pathway based on lifecycle carbon intensity reductions. While SAF investment remains modest relative to other biofuels, California's approach has catalyzed early market activity and inspired a growing number of states to take action.

Building on this momentum—and spurred by recent federal SAF incentives - states have moved quickly to implement SAF-specific policies aimed at attracting production, blending, and infrastructure investment. These incentives vary widely in structure, targeting producers, blenders, end users, and developers, and include:

- Washington: $1–$2/gal credit for producers/ blenders; through 2033; SAF also eligible under state Clean Fuel Standard
- Illinois: $1.50/gal credit for air carriers; 2023–2032
- Minnesota: $1.50/gal refundable credit for in-state production/blending, plus infrastructure support; 2024–2030
- Iowa: $0.25/gal producer credit for SAF with ≥50% GHG reduction; 2026–2035
- Arkansas: 30% equipment credit (up to $10M) for producers; starts 2025
- Nebraska: Up to $1.25/gal producer credit based on GHG reductions; 2027–2032
- Colorado: 30% refundable credit for SAF infrastructure and R&D; 2024–2032
- Oregon: SAF eligible under Clean Fuels Program with lifecycle-based crediting

Additional states are in various stages of policy action to support SAF scaling, as well.

State programs vary widely in structure and scope—supporting SAF through production, blending, end-use, and infrastructure—with credit values ranging from $0.25 to $2.00 per gallon and durations extending up to 10 years, often exceeding the shorter federal incentives.

Crucially, these state incentives are designed to be stackable with federal tax credits, helping to reduce the price premium of SAF and enhance its cost competitiveness with conventional jet fuel. This layered approach is essential to unlocking near-term deployment and building long-term market confidence.

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