ACA
AMERICAN CARBON ALLIANCE

SAF SHEET

Sustainable Aviation Fuel

Provides the Ethanol Industry with Great Opportunity

SAF expected to add value to ethanol of $1.25 to $2+ per gallon translating to $125 - $200+ million annually for a typical 100 mgpy ethanol plant

What is Sustainable Aviation Fuel?

Ethanol-based sustainable aviation fuel (SAF) is used by airlines in their effort to become more carbon neutral. With limited alternatives to power today's modern aircraft, SAF is expected to make up the majority of emissions reductions for the aviation industry. In 2022, global production of SAF amounted to just ~80 million gallons with additional capacity being planned around the globe to meet growing demand.

Growing Demand for SAF

Countries and companies around the world are planning to increase SAF usage, setting the stage for industry development and expansion. Corporate targets of SAF usage amount to 3.3 billion gallons annually by 2030. Governments are also incentivizing or requiring SAF usage through targets (U.S. – 3 billion gallons), mandates (EU, Japan) or various credits (Canada's Clean Fuels program, state level low-carbon markets, state level tax incentives, Clean Fuel Production Credit – 45Z).

How is SAF Made?

Ethanol to Jet (ETJ)

Ethanol is a low-carbon, scalable feedstock for the production of SAF. The industry has steadily improved its carbon intensity through efficiency gains and now has the opportunity to make a step-change reduction with carbon capture and storage (CCS). With reputable ETJ technology providers, ethanol is poised to supply the growing SAF market.

Hydroprocessed Esters & Fatty Acids (HEFA)

The vast majority of SAF produced today is through the HEFA process using fats, oils and greases. While a proven production process, the segment faces headwinds due to feedstock supply constraints and competition for the same inputs as the growing renewable diesel industry.

Emerging Technologies (Fischer-Tropsch & eFuels)

New technologies being developed for SAF include gasification and electricity to liquid fuels. Technological maturity, high capital & operating costs and large renewable energy requirements present challenges for large-scale deployment.

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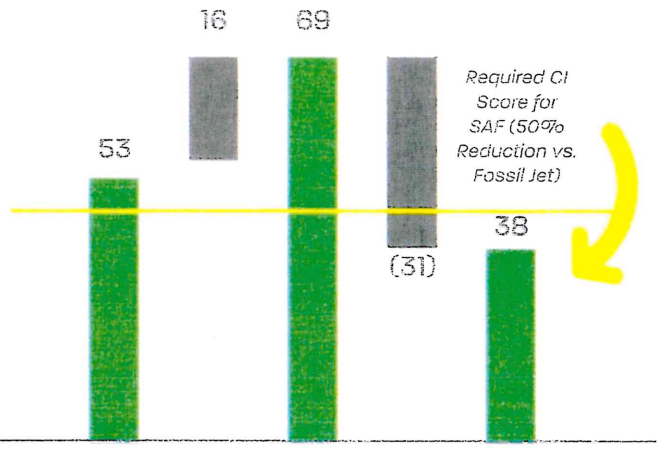
CCS enables SAF from ethanol that will create value and investment throughout the supply chain

Carbon Intensity Requirements for SAF

grams CO2e per megajoule

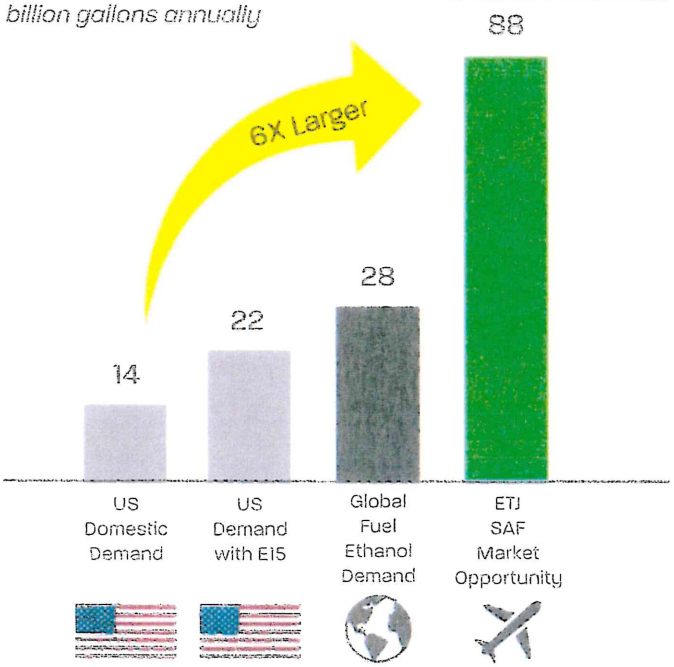


CCS Required for U.S. Corn ethanol SAF

D4 RINS & RFS | 45Z Tax Credits | SAF Buyers

Ethanol Market Size

billion gallons annually



- *SAF is a drop in fuel currently approved at up to 50% blend rates by ASTM International*
- *Upgrading SAF drives investments (Example: gevo's South Dakota project of over $1 billion not possible without CCS)*
- *SAF diversifies ethanol's major end markets beyond light passenger vehicles*

Sources: International Air Transport Association, ANL GREET, U.S. EIA, USDA, Industry Estimates Note: Assumes 57% SAF Yield per Ethanol Gallon

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