

Fueling the Future

Six hydrogen atoms, two carbon atoms, and one oxygen atom come together to form one of the world's greatest molecules: ethanol. In fact, because of its simplicity, ethanol is one of the oldest organic chemicals known to man. And while many know ethanol for its use in alcoholic beverages or as a gasoline substitute, they may not know that ethanol is an important chemical involved in the manufacture of many other products. As an industrial raw material, ethanol can be used to make adhesives, cosmetics, detergents, explosives, inks, chemicals, hand creams, plastics, paints, textiles, vinegar, and other products. Ethanol's use as a key ingredient for sanitizers and disinfectants also gained notoriety in 2020 and 2021, as global demand for hand sanitizer surged due to COVID-19.

As policymakers and others focus on climate change and the need to rapidly decarbonize, they are turning to ethanol again. All eyes are now focused on the role ethanol can play in new areas such as sustainable aviation fuel, offroad and heavy-duty equipment, and even generating low-carbon electricity.

In September 2021, RFA joined other industry leaders and officials from the Biden administration for a White House roundtable discussion on the future of sustainable aviation fuel, or SAF. In conjunction with the event, the White House announced a goal to achieve 3 billion gallons of

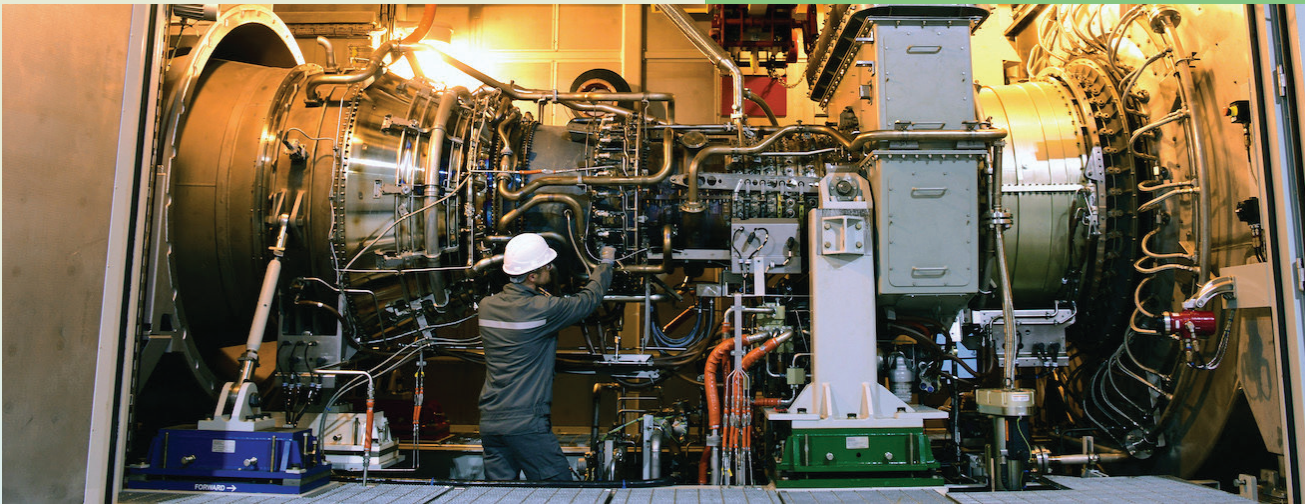
SAF production and reduce aviation-related emissions by 20 percent by 2030. RFA's members believe that with proper lifecycle accounting methods and the right policy incentives, ethanol can play a leading role in lowering the carbon intensity of the aviation sector.

At the same time, as the world focuses on expanding the power grid to accommodate more electric vehicles, ethanol could also serve as an excellent low-carbon, low-cost feedstock for power generation—especially as a fuel source for backup generators. Natural gas turbine power plants have traditionally used diesel as a backup fuel, but low-carbon ethanol can be used instead. In addition to lowering GHG emissions, the use of ethanol for stationary power generation would improve air quality and reduce water consumption. Going into 2022, RFA has recommended that the U.S. Department of Agriculture help develop “ethanol-to-electrons” technology via its Rural Energy Pilot Program.

Meanwhile, RFA member companies continue efforts to commercialize ethanol-powered engines for semi-trucks, farm equipment like tractors and combines, construction equipment, and other heavy-duty vehicles.

As we move into 2022, RFA expects the ethanol molecule to continue getting more and more attention as the transition to a low-carbon economy picks up speed.





The first power plant in the world using ethanol, the power plant at Saint-Pierre on Reunion Island in the Indian Ocean came into service in 2019 to produce energy for peak periods, securing the French island's power grid.



In December 2021, United Airlines became the first airline to fly a commercial jet full of passengers using 100 percent sustainable aviation fuel, on a flight from Chicago to Washington. Photo courtesy United.

White House Plan for Sustainable Aviation

Federal actions include:

- A new Sustainable Aviation Fuel Grand Challenge to help increase the production of sustainable aviation fuel to at least 3 billion gallons per year by 2030;
- New and ongoing funding opportunities of up to \$4.3 billion to support sustainable aviation fuel projects and producers;
- An increase in R&D activities to demonstrate new technologies that can achieve at least a 30 percent improvement aircraft fuel efficiency; and
- Efforts to improve air traffic and airport efficiency to reduce fuel use, eliminate lead exposure, and ensure cleaner air in and around airports.