

HONEYWELL ETHANOL TO JET TECHNOLOGY

Ethanol to jet fuel offers a more readily available feedstock supply to chart a more efficient pathway to profit.

The impending transition to a carbon-neutral world is creating the need for new fuel sources, such as ethanol, to support new applications. In response, we're expanding our Sustainable Aviation Fuel portfolio to include new ethanol to jet fuel technology.

NEW TECHNOLOGY CREATES NEW OPPORTUNITIES FOR ETHANOL

Ethanol to jet fuel charts a more efficient path to profits and represents a new revenue stream for ethanol producers looking for diversification to satisfy the needs of the large and growing aviation market.

Our revolutionary solution is a low carbon intensity, low CAPEX, low technology risk option that helps producers take advantage of existing supply chains, proven conversion technologies and feedstocks to create new revenue streams for ethanol in the aviation sector, allowing them to grow beyond the automotive sector. It is highly scalable, reliable, profitable and creates a more efficient route for converting renewable and waste-derived ethanol into useful platform chemicals to produce jet fuel. Adopting this technology also helps producers meet oncoming regulations and take advantage of the financial incentives that come along with them. Our world is evolving, and at Honeywell, we're focused on helping the refining industry evolve along with it. For us, this means making renewable fuels, like ethanol to jet, more accessible while helping to make refining more sustainable and profitable, and our planet more livable. We call that fueling the future.

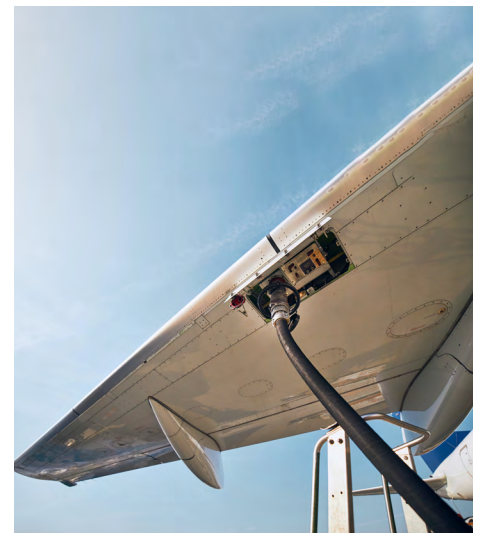
VALUE PROPOSITION

Honeywell's ethanol to jet process leverages more than a decade of Ecofining™ experience, low process carbon intensity and high yield of jet fuel. This is proven by UOP's track record in catalyst development and ability to economically scale from 30K to a billion gallons per year.¹ With our deep engineering experience and modular design, Honeywell's ETJ offers low utility costs and low catalyst costs ensuring low operating costs over the life of the plant.

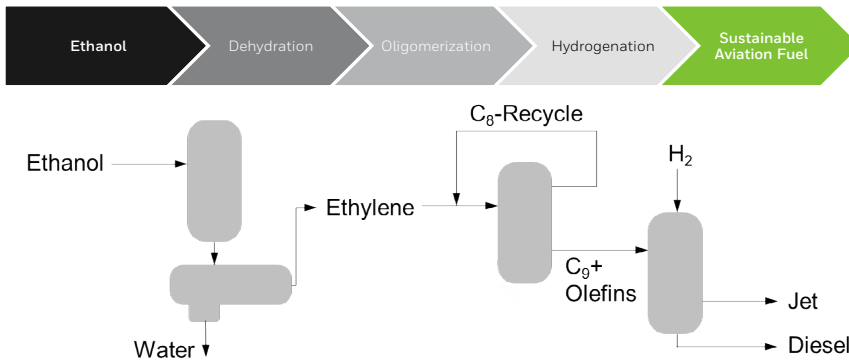
- Leverage experience from adjacent commercialized technologies such as MTA, Oleflex, In-Alk, Catolene and OCP
- FastFEED solutions such as a module for a fast-to-market solution
- Full scope catalyst and process supplier, enabling optimized solutions, minimizing recycle during execution and single point guarantee accountability

FEATURES & BENEFITS

- Proven technologies at an economic scale
- High selectivity to SAF
- Low carbon intensity
- Low CAPEX design
- Low cost of catalyst vs. liquid catalysts saves \$10-15M per year
- Low cost per gallon of SAF produced
- Low rates of wastewater generation
- Drop-in fuel replacement
- Meets ASTM D7566 standards



PROCESS/FLOW SCHEME



INFLATION REDUCTION ACT (IRA) IMPLICATIONS FOR UNITED STATES PROJECTS

The Inflation Reduction Act's support of SAF will greatly enhance the capabilities of fuel sustainability within the aviation industry. You can stack these credits in addition to the California LCFS and Renewable Fuel Standard RIN credits.



FIT FOR 55 PACKAGE PUTS THE EU ON THE PATH TO CLIMATE NEUTRALITY

Higher targets for renewable energy sources and requirements to cut greenhouse gas emissions by 55% by 2030 increase the need for solutions like SAF. Because SAF only represents 0.05% of total fuel consumption in the aviation sector, there's potential on the table to significantly reduce aircraft emissions.²

1. Based on internal analysis of related process technologies that have been commercially demonstrated
2. <https://www.consilium.europa.eu/en/policies/green-deal/fit-for-55-the-eu-plan-for-a-green-transition/>

For more information

www.uop.honeywell.com

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TARGET APPLICATIONS



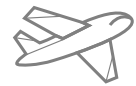
REFINING & PETROCHEMICAL



ETHANOL PRODUCTION



FUEL PRODUCTION



AIRLINES



POLICY MAKING



CONSULTING

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