

BRAND NEW AGAIN

Advances in Ecofining™ technology provide a cost-efficient, fast-to-market path to renewable diesel and jet fuels

Honeywell UOP

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MARKETS ARE DRIVING DEMAND FOR CHANGE

Refiners are facing a new world and new markets as the drive toward sustainability accelerates. Business is leading the change as major global corporations move to increase sustainability and lower greenhouse gas (GHG) emissions. The endgame is to produce low-carbon, sustainable fuels while maximizing available resources and reducing waste.



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MAKE YOUR REFINERY BRAND NEW AGAIN

Honeywell UOP has shaped the refining process since it began. As a global leader in sustainable fuel technologies, UOP helped pioneer the production of renewable fuels over a decade ago. Now, we've reinvented the renewable diesel and jet fuel process to help you reduce carbon emissions.

Our Ecofining™ technology for producing renewable diesel and jet fuel offers a fast, cost-effective roadmap to help turn underutilized assets into profit centers and make your business brand new again.



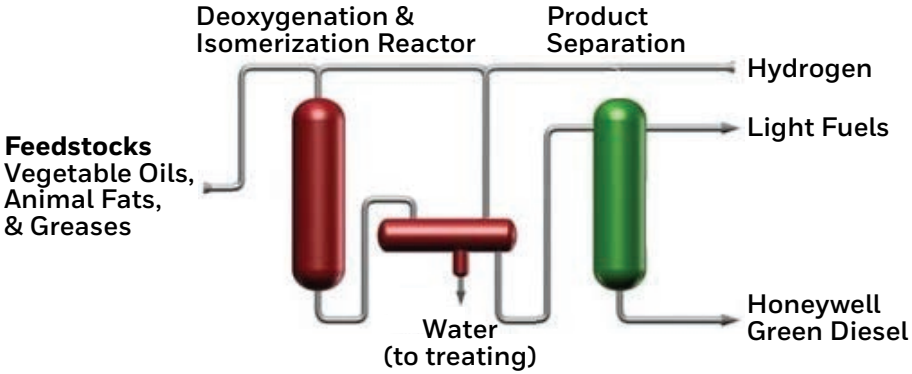
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RENEWABLE DIESEL AND JET FUELS OPEN DOORS TO NEW PROFITS

UOP Ecofining™ technology, originally developed with ENI of Italy, was first licensed in 2013. Now we've re-engineered our Ecofining process to reduce capital costs and increase profits. The addition of our new single-stage technology makes your transition to renewable fuels easy and affordable.

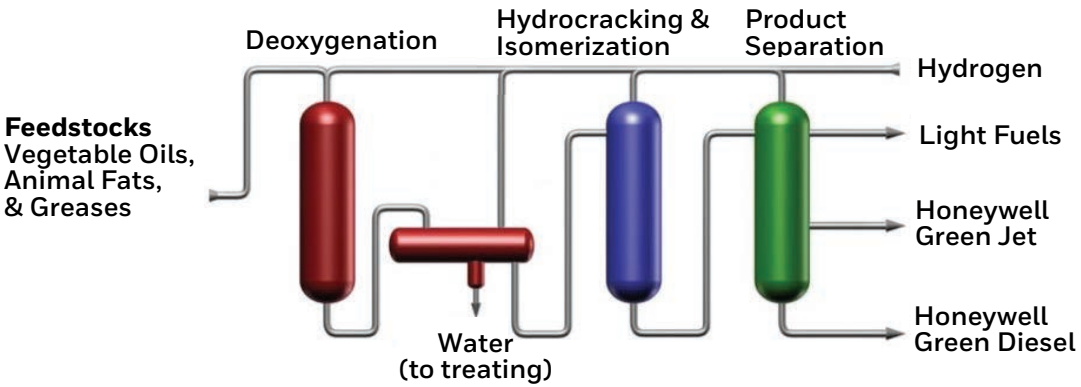
Ecofining™ Single-Stage for Renewable Diesel provides a low-cost, fast-to-market solution that is ideal for refinery revamps or greenfield projects.

- Reduced capital-cost solution for fast-to-market entry into production of diesel made from 100% renewable feedstock.
- Refinery retrofits can be completed in 12 to 18 months.
- Highly selective catalysts reduce cracking and increase isomerization to generate high yields across all cloud points.



Ecofining™ Two-Stage for Renewable Jet Fuel meets or exceeds the most rigorous jet fuel performance standards and can be made from a variety of sustainable feedstocks.

- Separate defined processing conditions deliver peak performance
- Flexible feedstock design for processing high-contaminant feeds
- Adaptable design for greenfield projects or refinery retrofits with two available reactors



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BOOST YOUR BOTTOM LINE WITH ECOFINING™ TECHNOLOGY

Honeywell UOP's Ecofining™ technology can help generate greater value from your existing assets and offers a quick return on investment. Our proven technology backed by decades of combined operating experience ensures your project is fast-tracked for profitability.

Your Bottom Line Benefits

- Deliver profits of $60–$100 per barrel, including current incentives available in North America
- Increase profits three to five times more than typical refining margins
- Reduce GHG emissions 60%–80% compared to petroleum diesel*
- Meet certain regulatory mandates for advanced biofuels

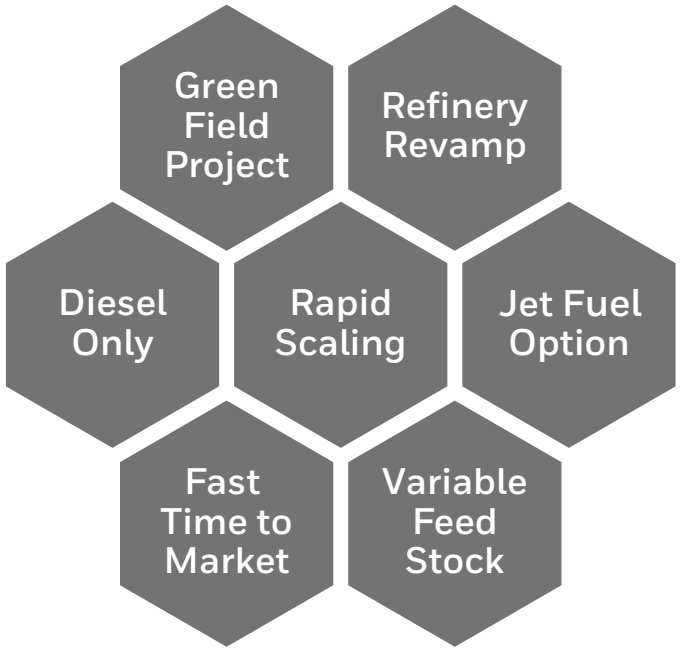
* Greenhouse gas emission savings calculations based on California Air Resources Board methodologies

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FLEXIBLE DESIGN GIVES YOU OPTIONS

With Honeywell UOP's reimagined Ecofining™ process, you now have even more options for renewable diesel and jet fuel. Our industry experience, global reach, and ability to scale all mean that our solutions can flex to address your specific situation and project.

Flexible options help you increase profit and reduce capital cost





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REPURPOSE YOUR REFINERY WITH COST-EFFICIENT REVAMP

Honeywell UOP technology can help you take what's old and make it new again using existing infrastructure to produce renewable diesel.

Single-stage Ecofining™ technology is ideal for refinery retrofits and offers a fast and cost-efficient path into renewable fuels. You can start with renewable diesel, and add jet fuel later.

Refinery revamps can quickly pave a path to profitability

- Typically cost 50–70% less than greenfield projects
- Can be completed in less than 12 months, with an average of 12–18 months
- Works for either one or two hydrotreater or hydrocracker reactors
- Use existing hydro-processing assets such as reactors, strippers, compressors, and fractionators
- Generate high yields for renewable diesel across all cloud points using new catalysts that reduce cracking and increase isomerization
- Straightforward expansion to two-stage processing for renewable jet fuel



SHRINK YOUR CARBON FOOTPRINT WITH NEW TECHNOLOGIES

As regulations expand and financial incentives increase, Honeywell UOP's decades of experience in molecule management can help you reduce or capture carbon emissions compared to petroleum fuels. We are developing a portfolio of solutions to help lower carbon emissions including renewable and blue hydrogen that can be incorporated into the Ecofining™ technology design.

For renewable hydrogen, UOP can integrate the design with the Ecofining™ process to efficiently use secondary products to reduce the overall carbon intensity of renewable diesel and jet fuel. For blue hydrogen, UOP offers the proven CO_2 Fractionation System, CO_2 Polybed PSA and and Amine Guard™ FS technologies.

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RENEW YOUR FUTURE WITH AN EXPERIENCED PARTNER

For over 100 years Honeywell UOP has anticipated the emerging megatrends and future challenges of the global energy market, developing new technologies to help meet the needs of our customers.

Today, the Honeywell UOP Sustainable Technology Solutions (STS) group is a global leader in the delivery of technologies for renewable diesel and jet fuels, as well as an array of other processes geared toward lowering greenhouse gases.



Honeywell UOP has always partnered with refiners to supply the fuels of a changing customer landscape.

- Proven commercial technologies
- Reduced project risk
- Faster project execution
- Ability to scale

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