

twelve | a world made from air



# e·fuels

Power-to-Liquid fuels  
made from air.



## what are eFuels?

E-fuels, or electrofuels, are synthetic hydrocarbon fuels created through the electrochemical conversion of CO<sub>2</sub> and water using renewable electricity, a process commonly referred to as Power-to-Liquid.

With up to 90% lower emissions than conventional fuels, e-fuels are a critical solution for reducing emissions in hard-to-electrify sectors such as aviation, shipping, heavy-duty machinery, and transport.

# 1 billion tonnes

In 2022, global commercial airlines consumed approximately 95 billion gallons of jet fuel, and emitted almost a billion tonnes of CO<sub>2</sub>, accounting for approximately 2.4% of global CO<sub>2</sub> emissions.

Source: IEA





**e·jet<sup>®</sup>**

E-Jet<sup>®</sup> SAF is sustainable aviation fuel made from air, with up to 90% lower emissions compared to traditional jet fuel. Its production uses 1,000 times less water and 30 times less land than biofuels. E-Jet SAF meets the certification standards of ASTM D7566 Annex A1.



A large container ship is docked at a port, with a massive green gantry crane positioned over it. The ship's deck is filled with colorful shipping containers. In the background, another container ship is visible on the water. The sky is clear and blue. The text "NEW PRIOK CONTAINER TERMINAL ONE" is visible on the crane's structure.

# 92 billion gallons

The global shipping industry consumes approximately 92.36 billion gallons of fuel annually, and emits about 1 billion tonnes of CO2 emissions.

Source: International Maritime Organization





**e·marine™**

E-Marine™ is drop-in certified marine gas oil that is made from CO<sub>2</sub> and renewable electricity. E-Marine has up to 90% lower GHG emissions, and significantly lower SO<sub>x</sub>, NO<sub>x</sub>, and particulate emissions than conventional marine gas oil. E-Marine meets ISO 8217 DMA.



**25% CO<sub>2</sub>e**

In 2022, diesel fuel consumption accounted for about 25% of total U.S. transportation sector CO<sub>2</sub> emissions.

Source: IEA

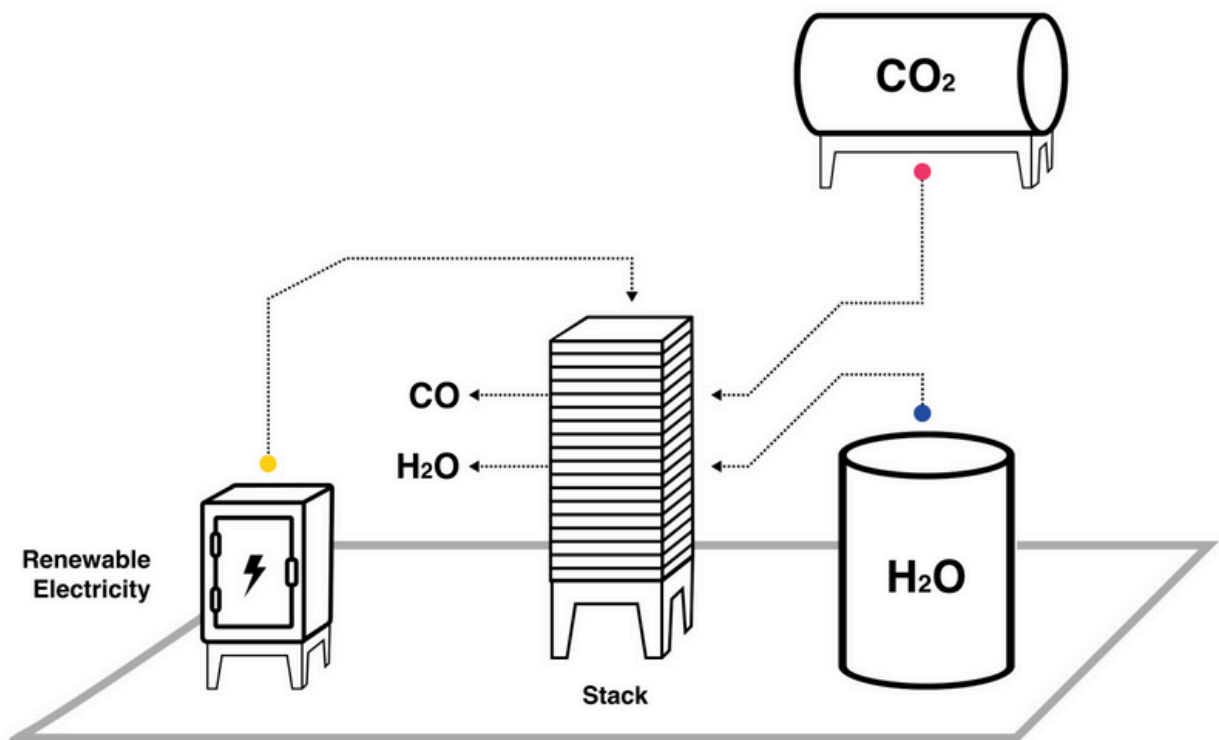


**e•lectrol™**

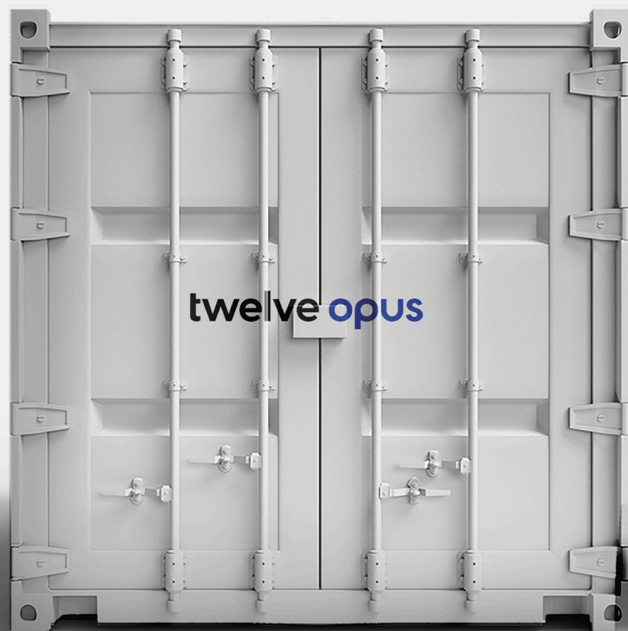
Electrol™ is drop-in e-diesel made from CO<sub>2</sub> and renewable electricity. Electrol has up to 90% lower GHG emissions, and significantly lower SO<sub>x</sub>, NO<sub>x</sub>, and particulate emissions than conventional diesel.

# how do we make e-fuels?

At Twelve, we produce e-fuels using CO<sub>2</sub> electrolysis, a process powered by renewable electricity that splits water and carbon dioxide into hydrogen (H<sub>2</sub>) and carbon monoxide (CO), producing oxygen (O<sub>2</sub>) as a byproduct. The resulting syngas is refined through Fischer-Tropsch synthesis into jet fuel, diesel and marine fuel—cleaner hydrocarbon fuels with up to 90% lower emissions than conventional fuels.







**opus**<sup>™</sup>

Our technology is a PEM-based CO<sub>2</sub> electrolyzer with novel transition metal catalysts engineered to convert CO<sub>2</sub>, water, and renewable electricity into new useful molecules—chemical building blocks for for fuels and materials that today are made from fossil fuels.



**airplant**<sup>™</sup>

AirPlant<sup>™</sup> is our industrial-scale production facility where we make e-fuels and e-chemicals from CO<sub>2</sub>, water, and renewable energy. AirPlant One is our demonstration facility located in Moses Lake, WA.



e-fuels for air,  
land, and sea

e-chemicals and  
CO2Made products

electrochemical  
technologies

# about twelve

We're the carbon transformation company. We utilize CO<sub>2</sub> as a resource, turning it into useful products like fuels and materials through the power of electrochemistry. At the intersection of renewable energy and industrial transformation, we're reinventing how the world's essentials are made, one molecule at a time.

**fuel for the long haul™**