

OxEon Energy Successfully Demonstrates Integrated Biogas-to-Oils Fuel Synthesis System in DOE-Verified Engineering-Scale Pilot

First-of-its-kind pilot plant converts both methane and carbon dioxide from anaerobic digester gas into liquid transportation fuels - completing 1,350 hours of operation and producing over 128 gallons of biofuel at an operating food waste biogas production facility.

SALT LAKE CITY, UT — OxEon Energy today announced the successful completion of a U.S. Department of Energy-funded demonstration project in which all primary project objectives were met or exceeded for converting anaerobic digester gas into liquid hydrocarbon transportation fuels. Conducted in partnership with the Wasatch Resource Recovery (WRR) facility in North Salt Lake, Utah, the project is the first known demonstration of a fully integrated, three-technology biogas-to-liquids system at engineering scale, with performance verified by an independent third-party.

The OxEon Biogas-to-Oils (BTO) system integrates three proprietary technologies developed and manufactured entirely in-house:

- **Solid Oxide Co-Electrolysis System (SOEC)** that converts carbon dioxide (CO_2) and steam into synthesis gas via high-temperature electrolysis;
- **Plasma Catalyzed Autothermal Reformer** that converts methane (CH_4) into synthesis gas;
- **Fischer-Tropsch (FT) Synthesis Reactor** that converts those synthesis gas streams into liquid hydrocarbon fuels.

Critically, OxEon's BTO platform productively utilizes *both* the CH_4 and CO_2 components of digester gas, unlike competing approaches that utilize only the methane fraction and vent the CO_2 .



OxEon's Biogas-to-Oils (BTO) system, installed at Wasatch Resource Recovery's anaerobic digester, produced 128 gallons FT oil and wax.

September 2025

1,350 Hours

Operated with >90% uptime

128 Gallons

Biofuel Produced

Jointly funded with the U.S. Department of Energy under DE-EE0008917, with support from South Davis Sewer District, Wasatch Resource Recovery, and BioFlight Fuels.

The integrated system was installed at WRR's active food waste to energy facility where it was supplied with renewable natural gas (RNG) and byproduct bio-CO₂ both produced in the WRR digester. Operated in three campaigns from July through December 2025, the system logged 1,350 total hours of operation, nearly three times the DOE milestone requirement of 500 hours and produced 126 gallons of FT oil and 2 gallons of FT wax. The FT system achieved 100% uptime during a final 430-hour continuous operating run. Independent third-party verification by DOE assigned Independent Engineers confirmed that all four primary DOE Statement of Project Objectives (SOPO) goals were met or exceeded.

The SOEC stack, designed and manufactured entirely by OxEon, achieved 71% conversion of CO₂ and steam feedstock, surpassing the 70% project target, at a syngas production rate of 2.9 kW LHV and a 100% stack thermodynamic efficiency. The Plasma Reformer sustained 80% CH₄-to-CO conversion throughout all operational periods. The full integrated system demonstrated 53% biogenic carbon-to-liquid-fuel conversion, exceeding the DOE milestone requirement of greater than 50%. Mass balance closure was achieved within 5%, confirming the rigor and reliability of the system's material accounting.

OxEon's vertically integrated capabilities, encompassing in-house R&D, process engineering, fabrication, systems integration, and field commissioning, were central to the project's execution. All three core technology systems were designed, built, and tested at OxEon's facility before being transported and installed at WRR. A comprehensive HAZOP review was completed prior to field commissioning. This end-to-end ownership eliminates the supply chain dependencies and technology interface risks that typically challenge multi-technology integrated energy demonstrations.

Backed by a \$36 million award under the Bipartisan Infrastructure Law, OxEon is establishing an automated SOEC stack manufacturing facility scaling toward 25 MWe of annual production capacity. The transition from manual stack assembly to automated production lines, paired with in-line inspection and testing, is designed to lower stack costs, shorten lead times, and secure a domestic supply chain for commercial-scale biogas-to-fuels and power-to-X deployments.

OxEon is pursuing commercial partnerships across biogas and waste-carbon sources - food waste co-digestion, municipal wastewater, agricultural digesters, landfill gas, and renewable natural gas operations. The system is feedstock agnostic, converting both the CH₄ and the CO₂ in a given gas stream to Fischer-Tropsch liquids that can be upgraded to diesel, sustainable aviation fuel, or maritime fuel. Modular design supports deployment across a range of facility scales and gas compositions. Interested parties are encouraged to contact OxEon to discuss project development opportunities.

About OxEon Energy

OxEon Energy LLC is an advanced energy technology company headquartered in North Salt Lake, Utah, specializing in the development, design, and manufacture of high-performance solid oxide electrochemical systems and integrated thermochemical fuel production platforms. OxEon's proprietary technologies, including solid oxide systems, plasma-catalyzed reforming, and Fischer-Tropsch synthesis, are designed, built, and deployed entirely in-house through a vertically integrated R&D, engineering, and fabrication organization. OxEon is developing a domestic automated SOEC stack manufacturing facility to support the commercial-scale deployment of clean energy technologies.

For more information, visit www.oxeonenergy.com.