

Hago Energetics

Challenge

Hago Energetics has developed systems that convert organic waste, such as agricultural waste, landfill gas, and wastewater treatment byproducts, into clean hydrogen for transportation and industrial use, as well as biochar for soil enhancement. California's 2045 carbon neutrality goals and the need to decarbonize agriculture and heavy-duty transport underscore the urgency of Hago's mission.

To advance commercialization and secure funding for its proposed hydrogen production facility in Madera, California, the company needed independent, third-party validation of its carbon footprint. Hago Energetics leveraged the U.S. Department of Energy's (USDOE) EnergyWerx voucher program, which provides in-kind technical support from industry experts, to accelerate the commercialization of clean energy technologies. Through this program, Hago chose EcoEngineers to conduct a life-cycle analysis (LCA) and evaluate potential carbon intensity (CI) reduction strategies for its proposed hydrogen production facility.



Solution

EcoEngineers conducted a comprehensive LCA using the California Greenhouse gases, Regulated Emissions, and Energy use in Technologies (CA-GREET) 4.0 model and the Tier 1 CI Calculator for Hydrogen. The analysis modeled hydrogen production via methane pyrolysis with biochar as a catalyst, assessing three different scenarios that deliver either gaseous or liquid hydrogen to nearby refueling stations and Los Angeles ports. The detailed analysis report quantified Hago's process CI score, including the impact of biochar soil sequestration.

Results

The LCA confirmed that Hago's hydrogen production pathway achieves negative CI scores, as low as -492 grams of carbon dioxide equivalent per megajoule, when accounting for

"EcoEngineers' LCA gave us the independent validation we needed to demonstrate our technology's carbon-negative potential. Their report provided a credible, data-backed CI score that helped us secure a USDOE grant and build investor confidence. It was a critical step in proving our commercial viability and advancing toward full-scale deployment."

- Wilson Hago, Founder, Hago Energetics

biochar soil application. While negative CI scores are counter-intuitive, they are increasingly recognized in regulatory frameworks when supported by rigorous modeling and third-party validation. Even without biochar carbon sequestration, the CI remained strongly negative. Hago leveraged the LCA report to secure a waste-to-fuel USDOE grant and for advancing investor discussions.

By validating the carbon-negative potential of Hago's approach, based on modeled scenarios and third-party validation of the LCA, EcoEngineers helped the company strengthen its case for funding and regulatory alignment. These results now serve as a foundation for future scale-up efforts and continued progress toward commercialization.

"Hago Energetics is demonstrating how innovative hydrogen production can support California's climate goals. Their ability to turn agricultural waste into low-carbon fuel shows real promise for scalable, impactful solutions in the clean energy transition."

- Tanya Peacock, Managing Director, California and Hydrogen, EcoEngineers



About Hago Energetics

Hago Energetics is in the business of providing decarbonizing solutions to the world. Its focus is to utilize waste resources to produce high value products; in particular, it utilizes waste gases and solids from agricultural facilities, landfills, wastewater treatment plants, dairy farms or unmonetized natural gas wells, to produce fuel cell grade hydrogen and biochar. For further information see <https://hagoenergetics.com/>.

About EcoEngineers

EcoEngineers, an LRQA company, is a consulting, auditing, and advisory firm exclusively focused on the energy transition and decarbonization. From innovation to impact, Eco helps its clients navigate the disruption caused by carbon emissions and climate change. Its team of engineers, scientists, auditors, consultants, and researchers operates at the intersection of low-carbon fuel policy, innovative technologies, and the carbon marketplace. For more information, visit www.ecoengineers.us.