

PROJECT DESCRIPTION FOR UH H2 PRODUCTION ECONOMY

H2 Production from Wastewater Treatment Plants

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Business Case

Municipal and Industrial wastewater treatment plants (WWTPs) have become a great pioneer asset that goes beyond their primary role of treating polluted water. They hold significant potential to become key players and local energy hubs in the clean energy transition contributing with resource recovery and power generation alternatives. In this case, clean H₂ is utilized to produce synfuels, particularly sustainable aviation fuel (SAF) which is gaining significant traction as a critical solution for decarbonizing the aviation industry, addressing both regulatory pressures and the demand for low-emission travel options.

Technologies and Economics

For H₂ production a 20 million gallons per day (MGD) WWTP was emulated. Biogas, from its anaerobic digesters, powered a combined heat and power (CHP) system that offsets a big portion of energy needs for H₂ and carbon capture technologies (CCSU). Ammonia recovered during the sludge dewatering process, provided an efficient feedstock for hydrogen production. Carbon Capture, storage and utilization technologies facilitated the transformation of captured CO₂ into synfuels, creating a circular carbon system within the facility.

This proposed approach of biogas, CHP, ammonia electrolyzer, H₂ and CCSU shown a potential yearly production of 128 tons of H₂ and 143000 gallons of synfuels with a \$ 11,220,000 overall CAPEX and a projected 7-year ROI.

Next Steps

This project highlights the high potential of WWTPs to contribute to the clean energy transition that will help to achieve the 2050 net zero goals by producing clean energy and utilizing wastewater treatment processes byproducts, demonstrating how innovative approaches can transform the wastewater treatment sector into a cornerstone of sustainability

