Control Number 2638-1523

Project: Entrained-Flow Biomass Gasification with Syngas Fermentation for Production of Sustainable Aviation Fuels

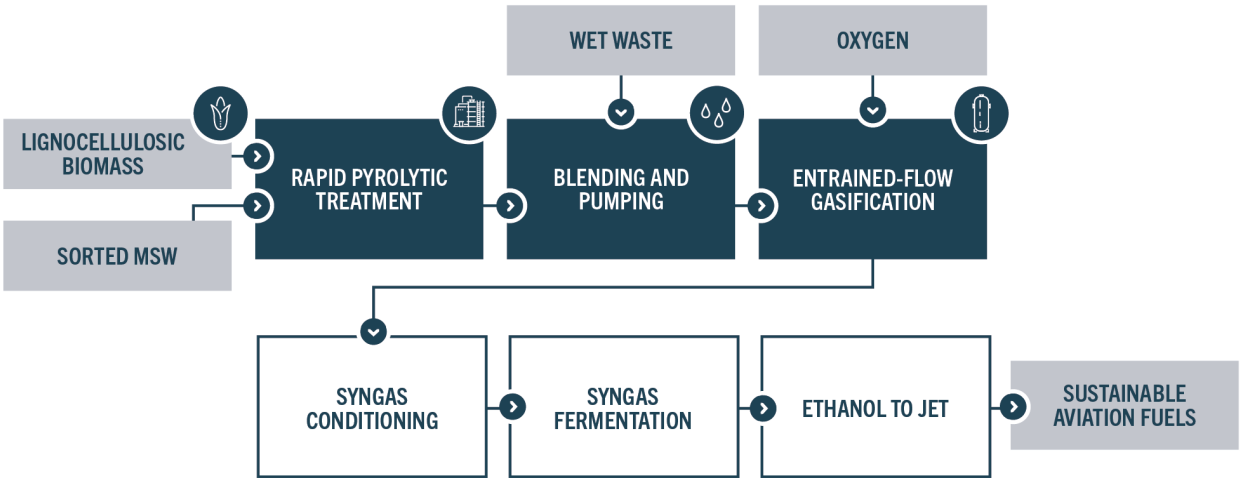
Applicant: University of Utah

Principal Investigator: Kevin Whitty

Team Member Organizations:

- Ensyn Corporation
- LanzaTech Inc.
- Linde Inc.
- Pacific Northwest National Laboratory

Project Objectives: This project will scale up and demonstrate that biomass can be efficiently processed in a pressurized entrained-flow gasifier to produce syngas suitable for production of sustainable aviation fuels (SAF). Expected outcomes include (1) showing that liquifying lignocellulosic biomass and sorted municipal solid waste by pyrolytic liquefaction enables it to be pumped and fed to a high-pressure gasifier, (2) demonstrating that conversion in an entrained-flow gasifier achieves more than 98% conversion of carbon to syngas, (3) proving that the syngas has negligible tar and soot and is suitable for fermentation to ethanol, and (4) verifying that SAF production via entrained-flow gasification with syngas fermentation can achieve a fuel selling price cost-competitive with petroleum-based fuels, with greater than 50% conversion of biogenic carbon to fuel, and GHG reductions of at least 70% relative to petroleum-based equivalents.



Potential Impact: Most steps in this strategy are commercial or have been demonstrated under industrially-relevant conditions. This project will demonstrate the technical feasibility of the least understood technological component – performance of bioliquids in the entrained flow gasifier. Broad deployment of a distributed, liquid format feedstock, coupled with entrained flow gasification, has the potential to produce 1 to 2.1 million barrels per day, or 71 to 152% of current aviation fuel demand, far exceeding the SAF Grand Challenge volumetric targets of 3 billion gallons per year by 2030 and 35 billion gallons per year by 2050.