

7th International Congress on

BIOFUELS AND BIOENERGY

October 02-04, 2017 Toronto, Canada

Conversion of landfill gas to drop-in renewable liquid fuel

Babu Joseph^{1,2}, John Kuhn^{1,2}, Devin Walker², Tim Roberge², Ali Gardezi² and Xianhui Zhao¹¹University of South Florida, USA²T2C-Energy LLC, USA

Landfills are in need of robust technology that can efficiently convert the environmentally harmful pollutants found in Landfill Gas (LFG) into harmless products. This LFG also represents a zero cost feedstock that can be converted into highly desired renewable liquid fuels that are in demand both in-house (diesel for garbage collection trucks) and outside markets (transportation sector). The garbage-trucking sector in the US consumes 1 billion gallons of diesel fuel annually with the average garbage truck using 8,600 gallons/year, making up 3% of the total US diesel consumption. This equates to a \$3-4 billion dollar expenditure on diesel fuel in this sector alone. USF has developed new catalyst technologies to first convert the landfill gas to syngas using a tri-reforming catalyst and then produce liquid hydrocarbon fuels using a Fischer-Tropsch Synthesis (FTS) catalyst specifically tailored to produce large fractions of middle distillate fuel. T2C-Energy LLC is working to commercialize this technology. By integrating this technology into gas capturing systems at landfills, landfill sites are able to convert naturally produced landfill gases into liquid transportation fuel (diesel). This technology provides a renewable source of energy while satisfying EPA regulations for reducing landfill gas (LFG) emissions at municipal solid waste (MSW) facilities. This technology produces a renewable, high quality, liquid transportation fuel resembling its petroleum derived counterparts. Thus, existing fuel infrastructure can be utilized in the use (no engine modifications) and transportation of the fuel. By using the green-fuel produced to power the landfill trucking fleet, this reduces greenhouse gas emissions not only from the landfill site but from the vehicles as well. This technology reduces fossil fuel use for the transport of waste to the landfill and drastically reduces the carbon footprint of the entire waste industry.

bjoseph@usf.edu