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Conversion of landfill gas to drop-in renewable liquid

Landfills need 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 gal/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.

Biography

Babu Joseph has graduated from IIT/Kanpur with BTech (Silver Medalist) in ChE and obtained his MS and PhD in ChE from Case Western Reserve University. He then joined the Energy Lab at MIT where he has worked on the development of ASPEN Simulator. He has joined the faculty of Chemical Engineering at Washington University in St. Louis in 1978 where he became the Edward C. Dicke Professor in 2000. In 2002, he has moved to become Chair of Chemical and Biomedical Engineering at USF. He is the Author of two books (*Real Time Personal Computing, 1989* and *Techniques of Model Based Control, 2002*), one edited volume (*Wavelet Applications, 1996*) and over 200 technical publications. During the year 1985-86, he was a Visiting Professor at the University of California at Berkeley. He is the Founder and VP for Research at T2C-Energy, LLC., a small business working on commercializing technology for converting landfill gas to diesel and jet fuel.

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