

# From household waste to jet fuel with Johnson Matthey

Visualisation courtesy of Fulcrum BioEnergy

## BCECA Engineering Project Focus

**Californian bioenergy company, Fulcrum, is a pioneer in the race to decarbonise air travel. Fulcrum will produce, low-cost, low-carbon, aviation fuel from household waste. In May 2018 construction started on its Sierra waste-to-biofuels facility in the Nevada desert**

Global leader in applied science and sustainable technologies, and BCECA member, Johnson Matthey (JM), has partnered with global energy giant BP to support Fulcrum's drive to convert municipal solid waste into jet fuel using gas to liquids technology. The plant employs the well-known Fischer Tropsch (FT) synthesis; a series of chemical reactions, which converts a mixture of hydrogen and carbon monoxide into liquid hydrocarbons. The technology is jointly licenced by JM and BP.

### Tackling the carbon challenge in the sky

Air travel currently accounts for around 2.5% of global CO<sub>2</sub> emissions. That number could rise as global air travel increases. Biofuel from waste offers an answer to the carbon challenge. The World Bank estimates that urban communities generate over 1.3bn tonnes of waste every day. JM and BP's technology offers an alternative avenue to convert this waste into transport fuels - including jet fuel and diesel. It is simple to operate, offers cost advantages and significant environment benefits.

The Sierra plant will be the first commercial scale operation in the US to convert municipal solid waste feedstock - that would otherwise be sent to landfill - into renewable transport fuel. The plant is expected to come on stream in 2020. From the outset it's expected to convert around 175,000 tonnes of household rubbish into approximately 11 million gallons of fuel each year. That's enough for 180 return flights between London and New York.



### Taking a well-known technology and making it better

This innovative application of an established technology will help to deliver a low carbon fuel that will play an important role in the energy transition. JM and BP have been developing and improving FT technology for over 30 years. Today, they have a system that delivers higher productivity than a conventional multi-tubular fixed bed reactor and halves the capital expenditure when compared to traditional FT reactors. The technology also delivers significant environmental and operational benefits.

### IChemE Award winner

The project caught the attention of the judges at the 2017 IChemE Global Awards ceremony in Birmingham, picking up both the Research Project of the Year Award and the Oil and Gas Award.

**For more information about our member companies, including Johnson Matthey, and other exciting developments in the engineering contracting sector, contact BCECA at Camelford House, 87-90 Albert Embankment, Lambeth, London, SE1 7T**

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