



## press release

25 September 2018

### **BP and Johnson Matthey license innovative waste-to-fuels technology to biofuels producer Fulcrum BioEnergy**

- BP and Johnson Matthey announce the signing of the first licensing deal for their innovative, award-winning Fischer Tropsch technology
- This technology will support Fulcrum's production of biojet fuel from municipal waste

BP and Johnson Matthey (JM) have signed an agreement with Fulcrum BioEnergy to license their Fischer Tropsch (FT) technology to support Fulcrum's drive to convert municipal solid waste into biojet fuel.

BP and JM have developed a simple-to-operate and cost-advantaged FT technology that can operate both at large and small scale to economically convert synthesis gas, generated from sources such as municipal solid waste and other renewable biomass, into long-chain hydrocarbons suitable for the production of diesel and jet fuels. Fulcrum will use the BP and JM technology in their new Sierra BioFuels Plant located in Storey County, Nevada, approximately 20 miles east of Reno.

The Sierra plant will be the first commercial-scale plant in the US to convert municipal solid waste feedstock, or household garbage that would otherwise be landfilled, into a low-carbon, renewable transportation fuel. When the plant begins commercial operation, planned for the first quarter of 2020, Sierra is expected to convert approximately 175,000 tons of household garbage into approximately 11 million gallons of fuel each year: equivalent to the fuel needed for more than 180 return flights between London and New York.

Angelo Amorelli, BP's technology vice-president of group research, said: "Through our partnership with Johnson Matthey, we have developed a robust high-quality technology built on great science and great engineering. Our technology can help deliver innovative low carbon fuels that can play an important role in the energy transition. We see this first licence as a stepping stone to other similar opportunities."

Eugene McKenna, Business Development and Innovation Director at JM added:

"JM is a leader in science that makes the world cleaner and healthier and in bringing this latest technology to market, we continue to apply our expertise to tackle some of the world's biggest challenges. We are delighted that Fulcrum has selected this technology to support their ambitions in supplying renewable fuels at significant scale. This is an important step in reducing the quantity of oil used to make transportation fuels and we will continue to use our science and engineering skills to facilitate wider adoption of this technology."

Both BP and JM have been developing FT technology for over 30 years and in 1996 joined forces to incubate and further develop the technology. Together they have developed a system that delivers three times the productivity of 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.

Working together, BP and JM won both the Research Project Award and the Oil and Gas Award at the prestigious IChemE Awards in November 2017 for their work on FT technology.

“We have been following BP and Johnson Matthey’s progress for several years, including the demonstrated performance and reliability of their innovative design. We are pleased to partner with them and license this improved FT technology for our Sierra BioFuels Plant,” said Jim Macias, Fulcrum BioEnergy President and Chief Executive Officer. “The BP/JM technology enhances the value of Fulcrum’s process for converting waste to low-carbon, drop-in fuels. We look forward to working with BP and JM as we build out our large development program.”

#### **About BP**

- BP is committed to a lower carbon future, aiming to reduce greenhouse gas emissions in its operations, improve its products and services to help customers lower their emissions, and create new low carbon businesses.
- Technology is ever-present in all that we do – from safely discovering and recovering oil and gas, to renewable energy, digital, and lower carbon fuels and products. We seek innovations that help to make our operations and products more efficient and sustainable.
- We have scientists and technologists at eight major technology centres in the US, UK, Asia and Germany. We complement our comprehensive research capability with external collaborations that provide a cross-cutting range of specialisms, supported by innovative academic programmes.
- For more information, please visit: [www.bp.com/technology](http://www.bp.com/technology)

#### **About Johnson Matthey (JM)**

- Johnson Matthey is a global leader in science that enables a cleaner and healthier world. With over 200 years of sustained commitment to innovation and technological breakthroughs, we improve the function, performance and safety of our customers’ products. Our science has a global impact in areas such as low emission transport, pharmaceuticals, chemical processing and making the most efficient use of the planet’s natural resources. Today more than 14,000 Johnson Matthey professionals collaborate with our network of customers and partners to make a real difference to the world around us.
- For more information, please visit: [www.matthey.com](http://www.matthey.com)

#### **About Fulcrum**

- Based in Pleasanton, California, Fulcrum is leading the development of a reliable and efficient process for transforming municipal solid waste into transportation fuels including jet fuel and diesel. The company’s plants will provide customers with low-carbon drop-in fuel that is competitively priced with traditional petroleum fuel. Fulcrum, a privately held company, has aligned itself with strategic feedstock, technology and fuel offtake partners to further strengthen and accelerate the company’s innovative approach to commercially producing large volumes of renewable fuel from municipal solid waste. For more information, please visit [www.fulcrum-bioenergy.com](http://www.fulcrum-bioenergy.com)

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#### **Notes to editors:**

- While fuel is generally blended, the Fulcrum bio-product has 80% less GHG emissions than a standard jet fuel. (*Figures based on Fulcrum’s analysis*)

- Approximately 1 ton of waste can produce 1 barrel of jet fuel.

**Cautionary statement:**

In order to utilize the 'safe harbor' provisions of the United States Private Securities Litigation Reform Act of 1995 (the 'PSLRA'), BP is providing the following cautionary statement. This press release contains certain forward-looking statements – that is, statements related to future, not past events and circumstances – which may relate to one or more of the financial condition, results of operations and businesses of BP and certain of the plans and objectives of BP with respect to these items. These statements are generally, but not always, identified by the use of words such as 'will', 'expects', 'is expected to', 'aims', 'should', 'may', 'objective', 'is likely to', 'intends', 'believes', 'anticipates', 'plans', 'we see' or similar expressions. Actual results may differ from those expressed in such statements, depending on a variety of factors including the risk factors set forth in our most recent Annual Report and Form 20-F under "Risk factors" and in any of our more recent public reports.

Our most recent Annual Report and Form 20-F and other period filings are available on our website at [www.bp.com](http://www.bp.com), or can be obtained from the SEC by calling 1-800-SEC-0330 or on its website at [www.sec.gov](http://www.sec.gov).