

The flexJET consortium is delighted to introduce its first newsletter edition.

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April 2019

flexJET is a four-year project part funded by the European Commission through the Horizon 2020 research initiative. The innovative flexJET project is diversifying the feedstock for sustainable aviation fuel (SAF) beyond vegetable oils and fats to biocrude oil produced from a wide range of organic waste. This is also one of the first technologies to use green hydrogen from the processed waste feedstock for the downstream refining process thereby maximising greenhouse gas savings and further contributing towards the Paris Agreement GHG reduction goals. This newsletter reports the latest news and developments of the flexJET project.

- [The project innovation](#)
- [Get to know the project consortium](#)
- [The first industrial-scale TCR[®] research & development plant](#)
- [flexJET presented to HRH the Prince of Wales](#)
- [Upcoming events](#)

The project innovation

This project provides clear technical and economic validation, by building a demonstration plant at pre-commercial scale to deliver high quality SAF. The size of the commercial plant will be determined by economic data from the project, which will optimise the plant size versus waste collection radius. This will be a showcase of the medium to long-term impact on the aviation industry in Europe and beyond.

flexJET's innovative process combines Sustainable Aviation through Biofuel Refining (SABR) technology from Green Fuels Research for the refining of biodiesel from organic waste fats with the Thermo-Catalytic Reforming (TCR[®]) technology from Susteen Technologies for the production of biocrude oil from organic solid waste. The hydrogen for refining will be separated from syngas using a decentralised technology from Hygear. As a first step, non-food competing waste vegetable oils (cooking oils) will be transformed into SAF in line with existing standards (hydro-processed esters and fatty acids, HEFA route – ASTM D7566, Annex A2).

Using hydrogen from residual biomass conversion and renewable process energy enables a significant reduction in the remaining CO₂ footprint of regular HEFA SAF. In the second step, SAF output will be increased by producing SAF through co-refining of organic waste fats with biocrude oil from food and market waste: the resulting novel SAF will be targeted for the ASTM approvals process.

The flexJET process is highly scalable and less capital-intensive than current technologies and can be integrated into existing infrastructure. It provides for a sustainable, cost-competitive aviation fuel by combining regional and local supply and demand strategies in a circular economy. As a key factor to the decarbonisation of the aviation transport sector, it contributes to the Renewable Energy Directive Targets in Europe and to the fulfilment of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) goals.





Get to know the project consortium

A consortium of 13 partners from five different European countries is coordinated by the University of Birmingham in UK. As part of Horizon 2020's new research and innovation programme, this project is assisting in the long-term goal of bringing innovative advanced biofuels from different kinds of sustainable raw materials to the market.

The project consortium comprises key industrial stakeholders with the knowledge and expertise to develop and implement a full commercial scale technology. The key industrial partners consist of stakeholders with expertise from across the whole value chain and include feedstock providers such as BIGA, engineering providers such as Green Fuels Research, Susteen Technologies, HyGear Technology and Services, and Fraunhofer Umsicht, and industrial partner for the downstream SAF supply chain and access to the aviation market such as SkyNRG. Academia is also heavily involved, with collaborators including the University of Bologna, the University of Birmingham and the University of Sheffield. Specific tasks supporting the technology/knowledge transfer and public outreach are being led by LEITAT, ETA-Florence and WRG Europe, project partners with valuable expertise in these fields.

Representatives of each consortium partner attended the third project meeting in Sulzbach-Rosenberg, hosted by Susteen Technologies at the end of March 2019, to review the first year tasks (current status) and plan future activities.



UNIVERSITY OF BIRMINGHAM



ALMA MATER STUDIORUM UNIVERSITÀ DI BOLOGNA



The first industrial-scale TCR® research & development plant

The first industrial-scale TCR® research & development plant achieved an important milestone with a successful 50 hours test run in May 2018. The plant processes up to 300 kg/h of dried sewage sludge and was built as part of a project for the demonstration of the energy-efficient conversion of sewage sludge funded by the Bayerische Staatsministerium für Wirtschaft, Energie und Technologie (the Bavarian Ministry of Economic Affairs, Energy and Technology) as part of their energy research program. The project also aims to demonstrate the use of TCR® bio-oil and syngas on an industrial dual fuel CHP plant and the gasification of char from sewage sludge. The project is conducted by the German waste management company Zweckverband Müllverwertung Schwandorf, the Institute for Energy Technology at the Amberg-Weiden University of Applied Sciences and Susteen Technologies GmbH. Susteen Technologies is responsible for the commercialization of TCR® technology.

This project also provides valuable information for the flexJET project in particular regarding the design and optimization of the TCR® reactor system. This plant and other connected prototypes were presented and explained to flexJET partners during the meeting in Sulzbach-Rosenberg.



Photo courtesy: Susteen Technologies GmbH



flexJET presented to HRH the Prince of Wales

Green Fuels Research (GFR) was honoured to receive a visit by His Royal Highness The Prince of Wales on Monday 17th December 2018. The visit was hosted by Mr James Hygate, Green Fuels Research CTO and Royal Warrant Holder and Mr Edward Gillespie OBE – Her Majesty’s Lord-Lieutenant for Gloucestershire.

During the visit Mr James Hygate provided a briefing on the company’s manufacturing, production and research activities, highlighting key projects.

The visit moved onto the renewable fuel laboratories to learn of projects currently underway at Green Fuels Research (GFR). His Royal Highness saw waste being converted into Sustainable Aviation Fuel (SAF) through GFR’s SABR process. This process is a key component of Project flexJET which will initially establish a waste to SAF demonstration facility in Germany supplying the airlines such as BA. “The Prince was shown the potential impact of SAF in decarbonising aviation and heard how the UK was leading the way in the processing of waste in this game-changing field” said Dr Sergio Lima, Green Fuels Research’s Senior Research Scientist.



Photo courtesy: Green Fuels Ltd.

Upcoming events



EUBCE 2019 - 27th European Biomass Conference & Exhibition
27 – 30 May 2019, Lisbon , Portugal

www.eubce.com

Session code: 3B0.7, Oil-based biofuels

Oral presentation:

flexJET project, Sustainable Jet Fuel from Flexible Waste Biomass

University of Birmingham

Tuesday, 28 May 2019

Room 5B

13:30 - 15:00



The 9th International Conference on Life Cycle Management

1st – 4th September 2019, Poznan, Poland

9th Life Cycle Management Conference, LCM 2019

1 - 4 September 2019 Poznan, Poland

www.lcm2019.org

THEME 2 (T2): SUSTAINABLE TECHNOLOGIES

‘Session T2-7: LCA of Biomass- and Non-Fossil Conversion-Technologies for Liquid Fuels’

Speech on

“Life Cycle Inventory of a pre-commercial demo plant using an innovative technology for the production of Sustainable Aviation Fuel (SAF) from flexible waste biomass”

University of Bologna



EU SUSTAINABLE ENERGY WEEK (EUSEW)

17-21 June 2019, Brussels, Belgium

www.eusew.eu

flexJET stand at The Energy Fair taking place at the Residence Palace, 20 June 2019, 09:00 - 12:30



The consortium with 13 partner organisations has brought together some of the leading researchers, industrial technology providers and renewable energy experts from across Europe, in a collaborative, committed and dedicated research effort to deliver the overarching ambition. Partners include: University of Birmingham, University of Sheffield, Green Fuels Research Ltd, WRG Europe Ltd, Susteen Technologies UK Ltd (UK), HyGear Technology and Services BV, SkyNRG BV (The Netherlands), Fraunhofer UMSICHT, Susteen Technologies GmbH, BIGA Energie GmbH (Germany), Alma Mater Studiorum – University of Bologna, ETA–Florence Renewable Energies (Italy) and LEITAT (Spain).

The project has a total duration of 48 months from April 2018 to March 2022 and will be funded by the European Union under the Horizon 2020 programme.

www.flexjetproject.eu
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