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News

Innovation and Industry

Renewable energies

Biofuels and e-fuels

Bionext and its partners have reached a major milestone in the development of low-carbon BioJet Fuels with the production of Fischer-Tropsch-synthesis products from wood waste biomass. This global first at semi-industrial scale validates the combination of torrefaction ? gasification ? Fischer-Tropsch synthesis for the flexible production of Sustainable Aviation Fuel (SAF), synthetic biodiesel and bionaphtha (feedstock for a sustainable chemical industry) from lignocellulosic biomass.

This represents a major step towards positioning the BioTfueL® technology as the leading solution for the production of sustainable aviation fuels making it possible to cut GES emissions by more than 90 %.

Stable and continuous gasification of various woody biomasses pre-treated by torrefaction were achieved over several weeks on the pre-industrial units allowing bio-based Synthesis gas (syngas) to be converted into Fischer-Tropsch products.

As the reduction of dependence to fossil fuels in the transport sector is becoming a top priority on most political agendas around the world following the Paris Climate Agreement, these results confirm the readiness of BioTfueL® technology for the production of SAF and advanced biofuels for road transportation.

Several renewable biomass waste feedstocks have already been qualified. The program is currently pursuing the validation of additional feedstock and the optimization of operating conditions.

An innovative process with optimized performance

BioTfueL® technology, whose demonstration units are located in Venette for torrefaction and Dunkirk (both in Hauts-de-France Region, France) for Syngas and Fisher-Tropsch, is built on four key industrial process steps : torrefaction of biomass, gasification, treatment and purification of the produced synthetic gas and subsequent conversion into advanced biofuels via Fischer-Tropsch synthesis.

BioTfueL®'s innovative concept hinges on its capacity to treat a broad spectrum of waste lignocellulosic biomasses, not competing with food applications. Thanks to its broad variety of potential feedstock, BioTfueL® technology can be deployed anywhere in the world. This flexibility will facilitate the yearly supply of any future industrial units and a potential reduction of its running costs.

The synergy of an industrial partnership

The BioTfueL® project was launched in 2010 with the ambition of testing, validating and optimizing a completely integrated chain for the production of advanced bio jet fuel and biodiesel. The technology can also produce bionaphtha, a renewable feedstock for the chemical industry. The program has been supported by the Bionext partners, by the French government via a subsidy of ADEME (France) and its Research Demonstrator Fund, the Hauts-de-France region and European Community via the European Regional Development Fund (ERDF) and by the French association of oil seed producers via the FASO fund.

The project is driven by Bionext which coordinates the expertise brought by its six partners and shareholders : research organizations (IFP Energies nouvelles and the CEA), technology providers (Axens, Thyssenkrupp Industrial Solutions) and industrial players (Avril, Total).

> « This important milestone is the result of a collective human adventure over almost 10 years. Several technological issues have been overcome and solved, thanks to the commitment and focus of several experts from our partners, thus giving the world a proven solution to significantly reduce GES emissions from air transportation » says Paul-Joel Derian, President of Bionext.

> « BioTfueL Technology produces a fuel that it is equivalent to oil-based kerosene, taking advantage of waste biomasses. It can readily replace existing fossil fuels for use in the current generation of plane engines. » adds Laurent Bournay, General Manager of Bionext and BioTfueL Project Director.








VENETTE UNIT From biomass to energy carrier

DUNKIRK UNIT From energy carrier to synthetic fuels

Key figures for the BioTfueL project

- Partners: Avril, Axens, CEA, IFP Energies nouvelles, Thyssenkrupp Industrial Solutions, Total.
- Budget: €190 million, including €33.2 million state funding.
- Location of the biomass pre-treatment demonstrator: Avril's Venette site (Oise, northern France).
- Location of the gasification, purification and synthesis demonstrator: Total's Etablissement des Flandres near Dunkirk (Nord, northern France).

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BioTfueL®: Successful advanced biofuels production from woody biomass on demonstration units
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