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**HyFlexFuel** works on advancing hydrothermal liquefaction (HTL) as key technology for truly sustainable and economically competitive production of drop-in fuels from a broad range of biomass feedstocks.

[More about the project here »](#)

### **Successful first hydrothermal liquefaction campaigns**

In the first year of the project, three initial Hydrothermal Liquefaction (HTL) campaigns were successfully conducted using the pilot-scale research plant of Aarhus University (Denmark) that allowed continuous processing in an industrially relevant environment. Sewage sludge, the microalgae *Spirulina* and *Miscanthus* were used as starting biomass feedstocks. 60 L of slurry per hour were fed into the reactor, overall yielding >10 kg of biocrude and >200 L of aqueous phase from each feedstock. [Publication »](#)

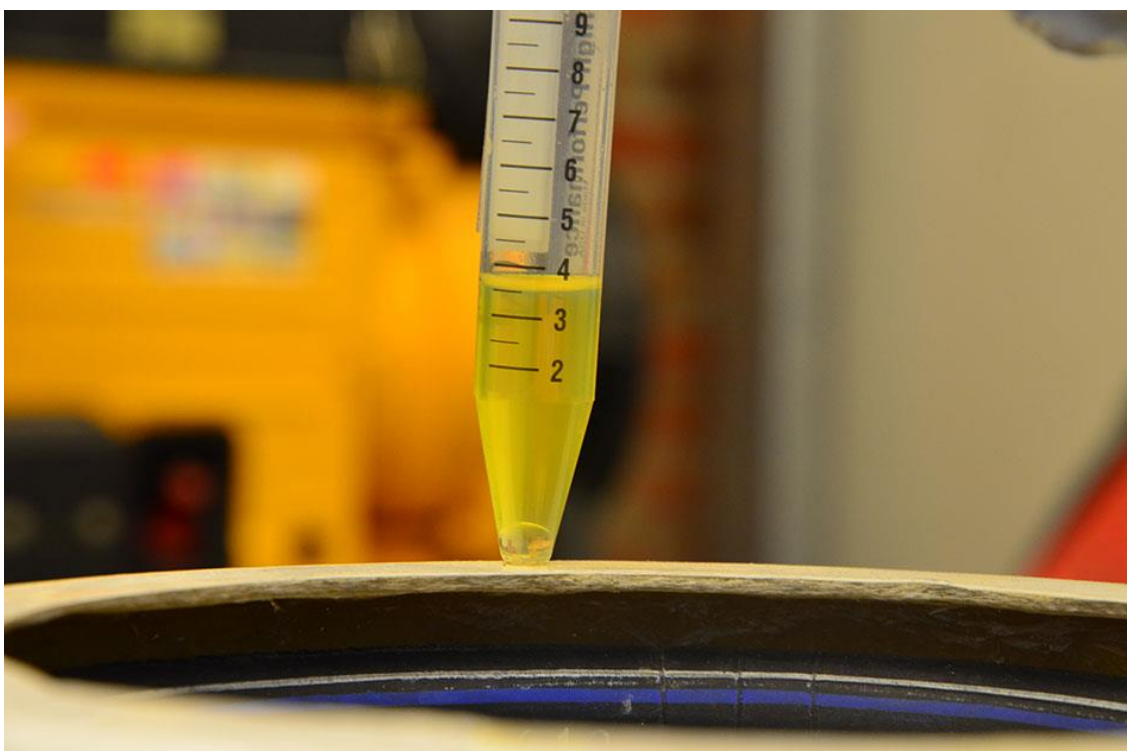
Picture 1: Biocrude produced in the first HTL campaign. © Aarhus University



This enabled the supply of sufficient sample volumes to all project partners for further analysis and conversion experiments. The HyFlexFuel partners have been busy in the first year of the project as highlighted here.

### ***Almost complete deoxygenation and denitrogenation achieved***

At Aalborg University (Denmark), researchers have conducted several tests on catalytic upgrading of biocrude in batch reactors, exploring a number of process conditions with biocrudes from several biomass feedstocks: miscanthus, microalga *Spirulina* and sewage sludge. Results show a dramatic improvement in the biooil characteristics, achieving almost complete deoxygenation and denitrogenation and a great potential towards the production of renewable diesel and jet fuel. [Publication »](#)



Picture 2: Hydrotreated biocrude sample. © Aalborg University

### ***Successful catalytic hydrothermal gasification campaigns***

The valorisation of residual process streams plays an important role in HyFlexFuel. Researchers at the Paul Scherrer Institute (Switzerland) successfully conducted campaigns for the continuous catalytic hydrothermal gasification (cHTG) and mineral separation respectively of the organics and salts dissolved in HTL process water, while HyFlexFuel partner OWS (Belgium) performed first screening tests of anaerobic digestion as alternative technology for treating the HTL aqueous phase. The University of Hohenheim (Germany) carried out experiments on the recovery of valuable inorganic nutrients from HTL product phases through precipitation of ammonium magnesium phosphate (struvite).



Picture 3: Anaerobic digestion for biogas production. © OWS

In the further course of HyFlexFuel it is planned to demonstrate all individual process steps in continuous mode and in a relevant operational environment.



Picture 4: Pilot-scale HTL facility at Aarhus University. ©Aarhus University

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## Coming-up



If you would like to participate to the summer school, please contact the HyFlexFuel Project Office at [hyflexfuel-arttic@eurtd.com](mailto:hyflexfuel-arttic@eurtd.com)

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## About the project

The project HyFlexFuel is focused on the development of a production chain for sustainable liquid fuels based on hydrothermal liquefaction of various biomass feedstocks.

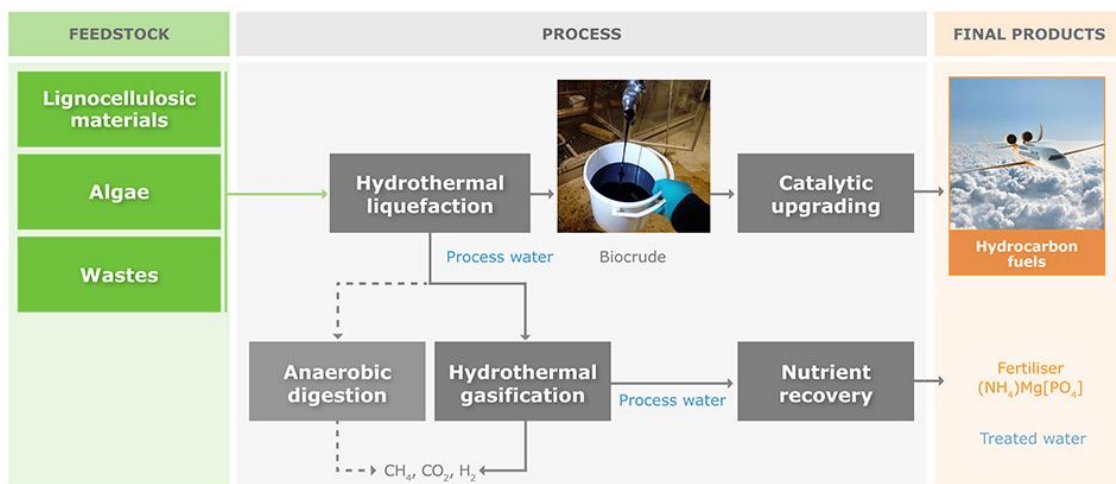


Figure 1: The HyFlexFuel process. ©HyFlexFuel consortium

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**Who we are**

Ten partners from six different European countries have teamed up to develop these new technologies.

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***"HyFlexFuel addresses the entire value chain, from feedstock supply to final fuel products and also the valorisation of residual process streams. The project contributes substantially to the development of HTL-based production of sustainable fuels."***

Arne Roth  
 Lead of Alternative Fuels  
 Bauhaus Luftfahrt e. V.  
 HyFlexFuel coordinator



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