



# ABC Salt

Advanced Biomass Catalytic  
Conversion for Liquid Biofuels

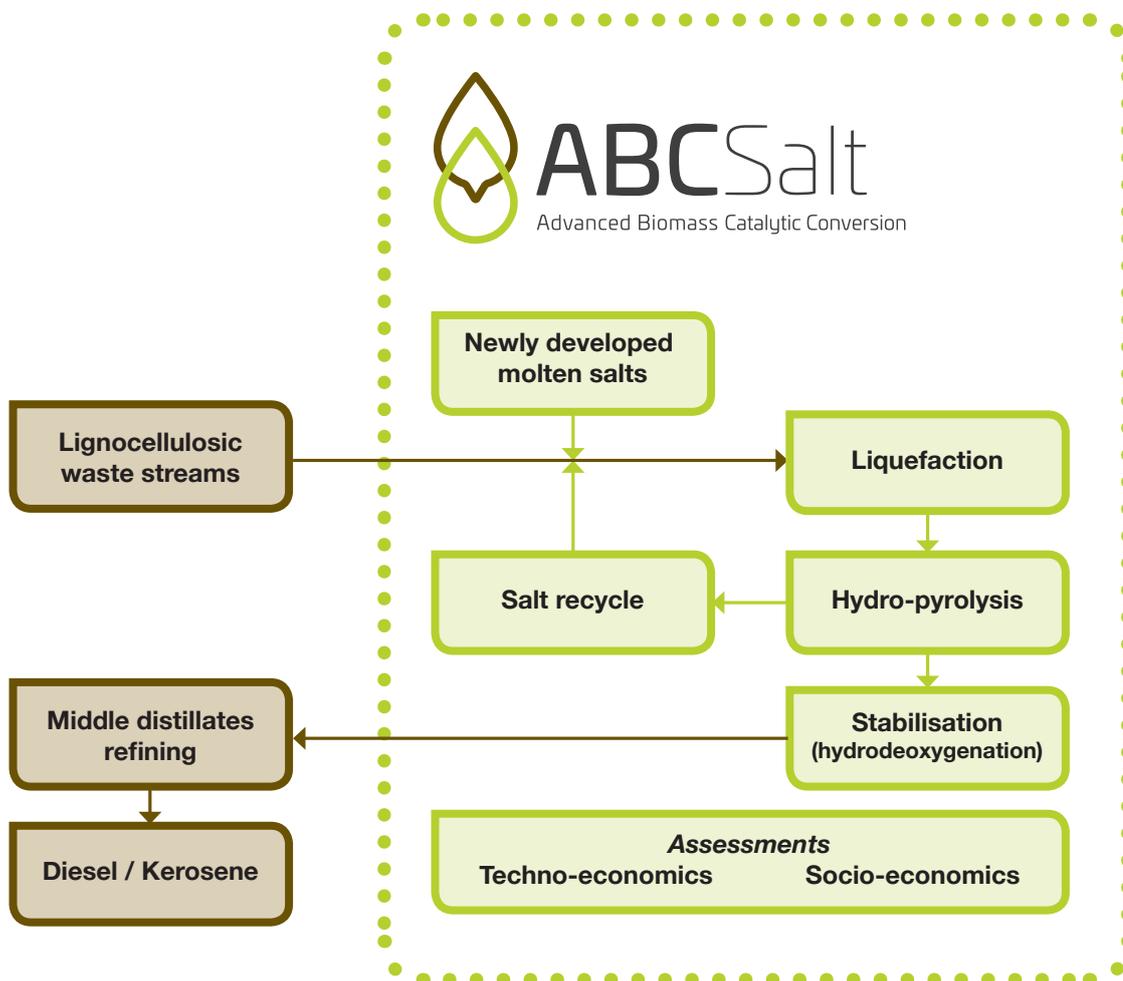


**ABC-Salt is a four-year European Horizon 2020 project running from 2018 to 2022. A Research Consortium of nine European partners are developing an innovative new route to sustainable liquid biofuels such as middle distillates from various lignocellulosic waste streams. The project's aim is to reach a conversion efficiency of lignocellulosic feedstock to middle distillates biofuels of at least 35wt.% dry biomass yield.**

The conversion route consists of dissolution of the biomass in molten salts with subsequent catalytic hydro-pyrolysis and hydro-deoxygenation. The ABC-Salt Research Consortium is advancing the proposed conversion process to Technology Readiness Level (TRL) 4 in preparation for commercialisation. The socio- and techno-economic viability of the new technology is also being assessed, which includes the availability and supply chain of the feedstock, future end-users and the sustainability of the process. These will help to gain commercial and social acceptance of this new technology for its future deployment.

This proposed concept will be a stepping stone to innovative new technology pathways, and will thus provide new solutions to energy challenges.

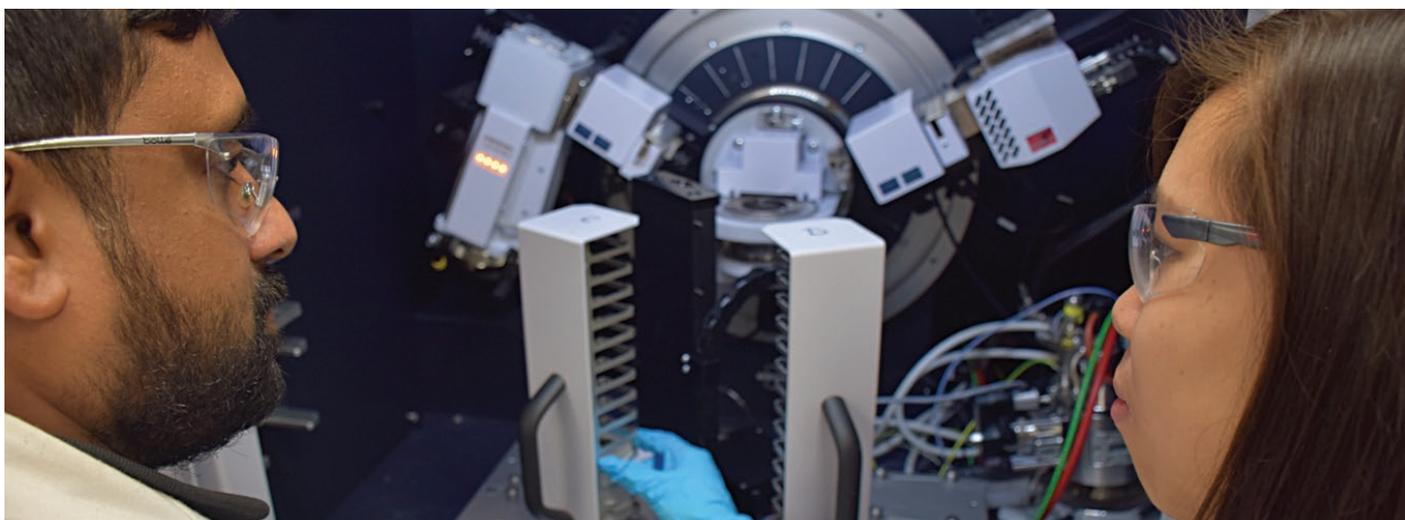
# Advanced Biomass Catalytic Conversion to Middle Distillates in Molten Salts



## The ABC-SALT project is addressing the following technical challenges:

- > The selection and characterisation of molten salts for liquefaction of lignocellulosic feedstocks and upgrading studies
- > The liquefaction and subsequent catalytic hydro-pyrolysis of biomass in a molten salt environment
- > The catalytic hydro-deoxygenation of the vapour phase using suitable catalysts
- > Creation of a hydrocarbon product for use as a middle distillate biofuel
- > An integrated laboratory scale reaction system is planned to run for at least 100 hours so that TRL 4 (Technology Readiness Level 4) is achieved.

A socio-economic and techno-economic viability study will provide a holistic approach which considers the full value chain, starting with the feedstock suppliers, through the complete process to deployment of the end biofuel product. It will also consider the impact on the wellbeing of society as it transitions to increased use of biofuels. The resulting data will provide valuable input for any potential scale up or for further industry-oriented research.



## ABC-SALT Project Work Packages

### **WORK PACKAGE 1**

**Ethics Requirements:** This work package is led by the University of Groningen, Netherlands, who is also the project co-ordinator for ABC-Salt. This work stream ensures ABC-Salt fully adheres to ethics requirements and minimises risks of harm to the environment.

### **WORK PACKAGE 2**

**Techno and socio-economic evaluation:** This work package is led by the German Aerospace Centre, DLR, and ensures that the technology developed is technologically, economically, environmentally, and socially relevant.

### **WORK PACKAGE 3**

**Primary liquefaction:** This work package is led by Norwegian University of Life Sciences, NMBU who selects the feedstock supply and the molten salts.

### **WORK PACKAGE 4**

**Hydropyrolysis in molten salts:** This work package is led by the University of Ghent, Belgium and focuses on identifying suitable process conditions for the hydro-pyrolysis of biomass in molten salts, with the liquid product yield and quality as key performance indicators.

### **WORK PACKAGE 5**

**Hydrodeoxygenation:** This work package is led by the Biomass Technology Group (BTG), Netherlands. BTG is studying the refining of oils produced from biomass by cracking the product in molten salts baths. This will optimise the bio-liquid as a feed for middle distillates. BTG is also working on the scaling up and commercialisation of ABC-Salt's processes and technologies and monitoring intellectual property rights.

### **WORK PACKAGE 6**

**Demonstration of integrated concept:** This work package is led by the University of Groningen, Netherlands. Based on the results of Work Packages 3 to 6, an integrated laboratory scale reaction system will be built to test the process of transforming biomass into middle distillate based biofuels. The expected scale is 100g/h.

### **WORK PACKAGE 7**

**Communication, dissemination, outreach activities and exploitation:** This work package is led by Aston University who will maximise the impact of the ABC-Salt project through a project website, newsletters and social media. Partners will provide regular news updates.

### **WORK PACKAGE 8**

**Project Management:** ABC-Salt is managed by the University of Groningen and Ayming Consultancy.



# ABC Salt

Advanced Biomass Catalytic Conversion



university of  
 groningen

.....

**Prof Erik Heeres**  
(Project Co-ordinator)  
h.j.heeres@rug.nl



ayming

.....

**Ms Fabienne Brutin**  
fbrutin@ayming.com



Aston University

.....

**Prof Tony Bridgwater**  
abc-salt@aston.ac.uk



.....

**Dr Robbie Venderbosch**  
venderbosch@btgworld.com



DLR  
Deutsches Zentrum  
für Luft- und Raumfahrt  
German Aerospace Center

.....

**Dr Ralph-Uwe Dietrich**  
Ralph-Uwe.Dietrich@dlr.de



GHENT  
UNIVERSITY

.....

**Prof Frederik Ronsee**  
frederik.ronsse@ugent.be



Norwegian University  
of Life Sciences

.....

**Dr. Heidi Samuelsen Nygard**  
heidi.nygard@nmbu.no



.....

**Dr. Maria Sedin**  
maria.sedin@ri.se



SAPIENZA  
UNIVERSITÀ DI ROMA

.....

**Prof Marino Bonaiuto**  
marino.bonaiuto@uniroma1.it

This project has received funding from  
the European Union's Horizon 2020  
Research and Innovation Programme  
under grant agreement number 764089.

