ADVANCEFUEL

Strategies for overcoming the main barriers to the successful market roll-out of advanced fuels

Approaches of the ADVANCEFUEL Project

Kristin Sternberg
FNR
Fuels of the Future Conference 2019
Berlin, 22/01/2019

ADVANCEFUEL PROJECT

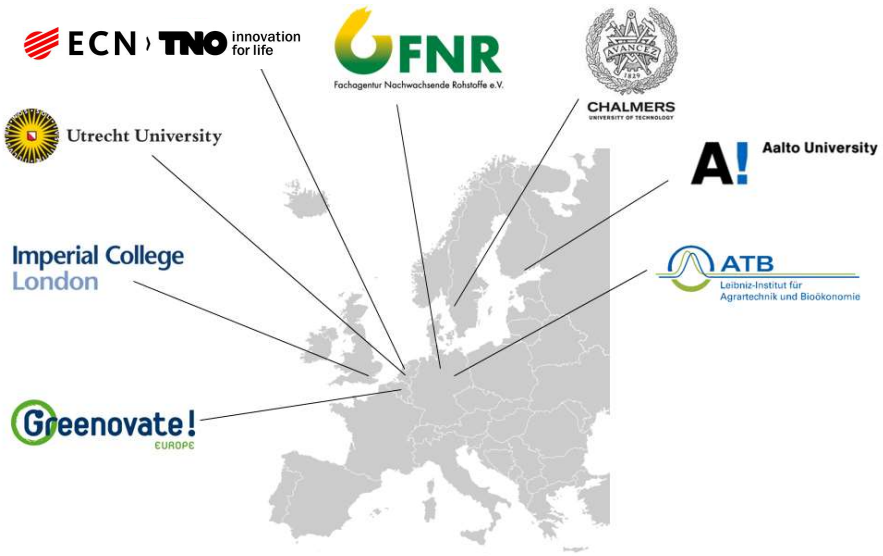
Presentation's outline

- Project presentation
- General approach of ADVANCEFUEL's work
- Identification and verification of main barriers to the market uptake of advanced fuels
- Way forward
- Possibilities to contribute to the outcomes of the project

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

ADVANCEFUEL PROJECT

Facilitating market roll-out of RESfuels in the transport sector to 2030 and beyond



- **8 partners** from 7 different countries
- Duration: **3 years** (September 2017-August 2020)
- **Coordinated** by FNR, German Agency for Renewable Resources with the support of the Energy Research Centre of the Netherlands (ECN part of TNO)
- **Funded** by the European Commission under the Horizon 2020 programme

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

ADVANCEFUEL – Objective

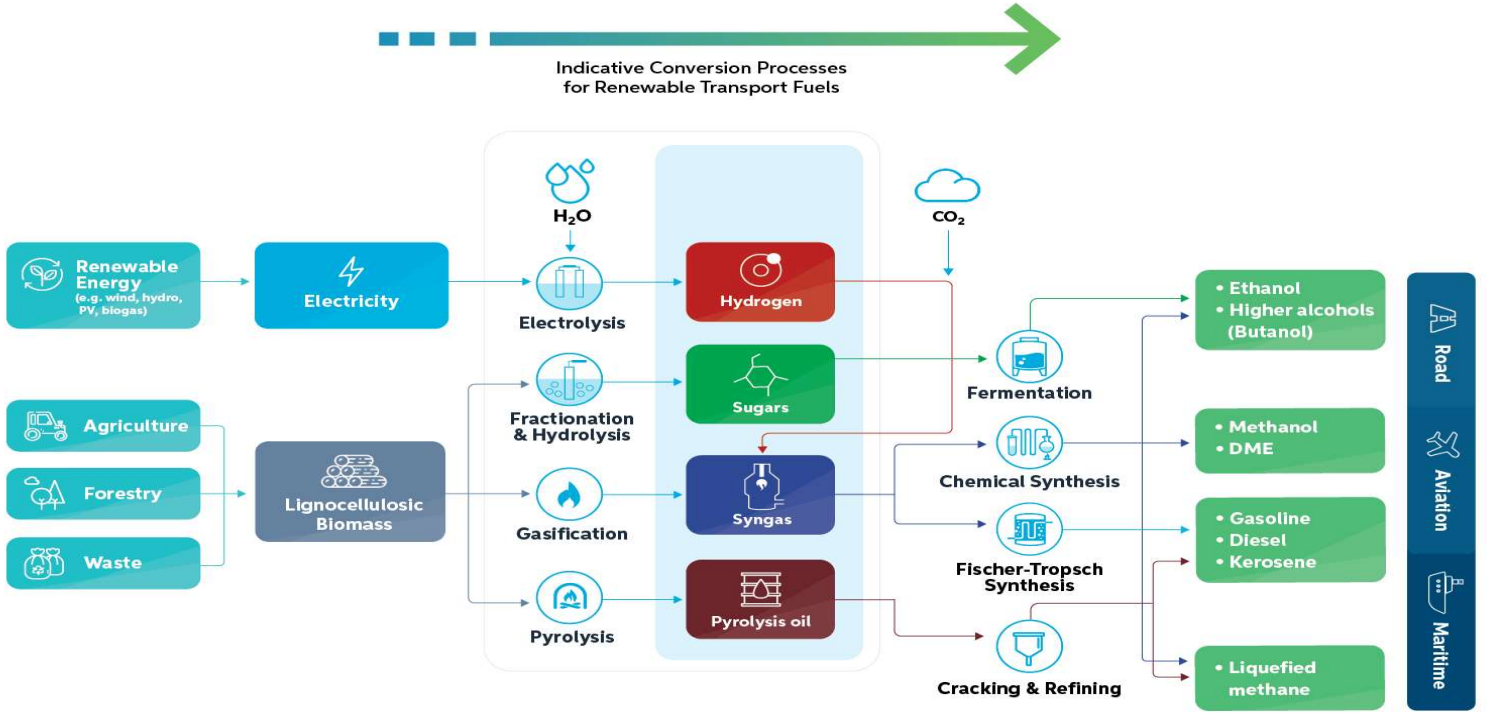
Goal: to increase the share of renewable energy in the future energy mix by increasing the share of sustainable advanced biofuels and renewable alternative fuels in the final EU transport energy consumption.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

ADVANCEFUEL

Project Scope

ADVANCEFUEL focuses on **liquid advanced biofuels and other liquid renewable fuels,** jointly referred to as **'RESfuels'**



Renewable resources
ADVANCEFUEL will focus on fuels produced from renewable resources, such as residues from agriculture and forestry, sustainable woody and grassy crops, waste and renewable energy, carbon dioxide and hydrogen.

Conversion processes
ADVANCEFUEL will look at different conversion processes that are already at a high development stage and have been validated in an industrial environment.

Renewable liquid fuels
Ultimately, ADVANCEFUEL aims to support uptake of both advanced biofuels and fuels produced from renewable hydrogen and CO2 in the road, aviation and maritime transport sectors.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

ADVANCEFUEL - approach

- Identify and prioritise barriers to the acceleration of the market uptake of advanced fuels
- Investigations of the problems along the entire value chain
- Elaboration of innovative concepts and recommendations
- Development of numerical tools for the prediction of fuel properties
- Updated tool for full-chain assessment of alternative renewable transport fuels (based on ECN's RESolve Biomass model)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

ADVANCEFUEL

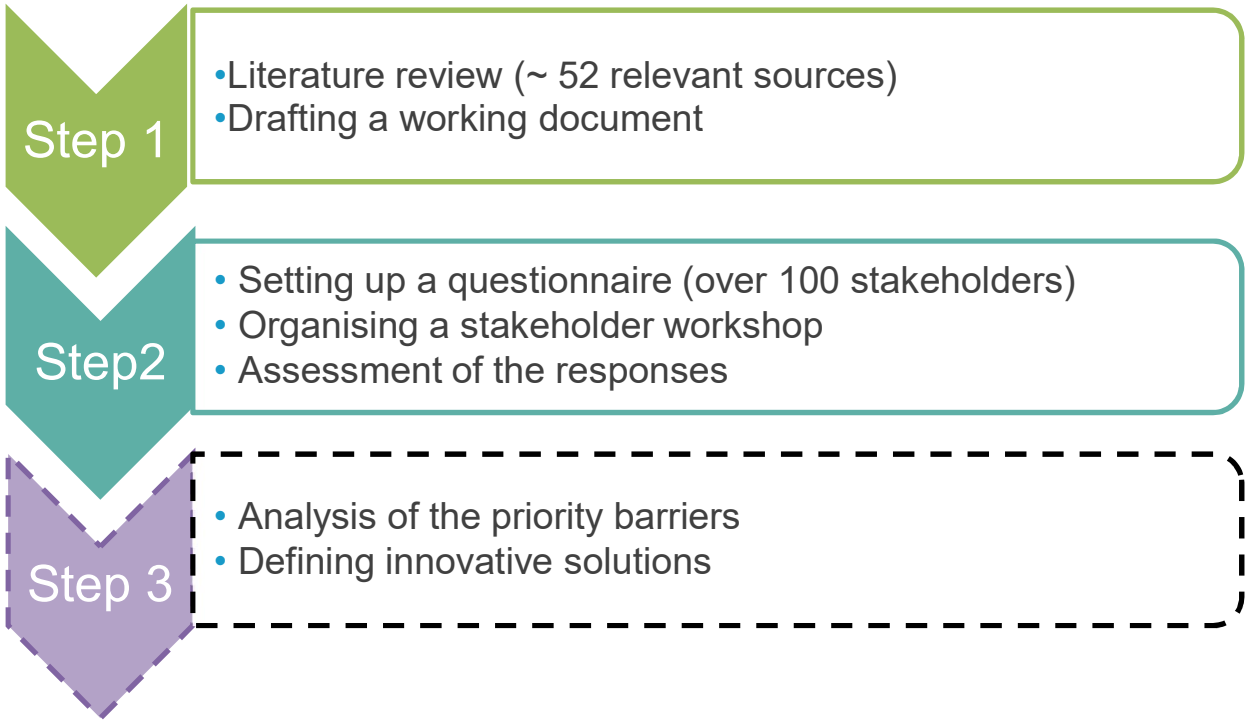
Outputs of the project will include:

- Information about **upgrading strategies for lignocellulosic feedstock supply chains and cropping schemes**;
- Information on **innovations for** high efficient and low risk biomass **conversion technologies**
- Insights on **RESfuel/ fuel blend properties and effects on end use** fuel performance
- Definition of options to **tailor and harmonise sustainability certifications** that fit RESfuels requirements
- Identification of Best Practices (including suggested innovations) along the value chain, which promote the market
- **an updated RESolve-Biomass model**, which covers the whole value chain

=> Will result in concrete market and policy-oriented **recommendations to accelerate market uptake of advanced fuels**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

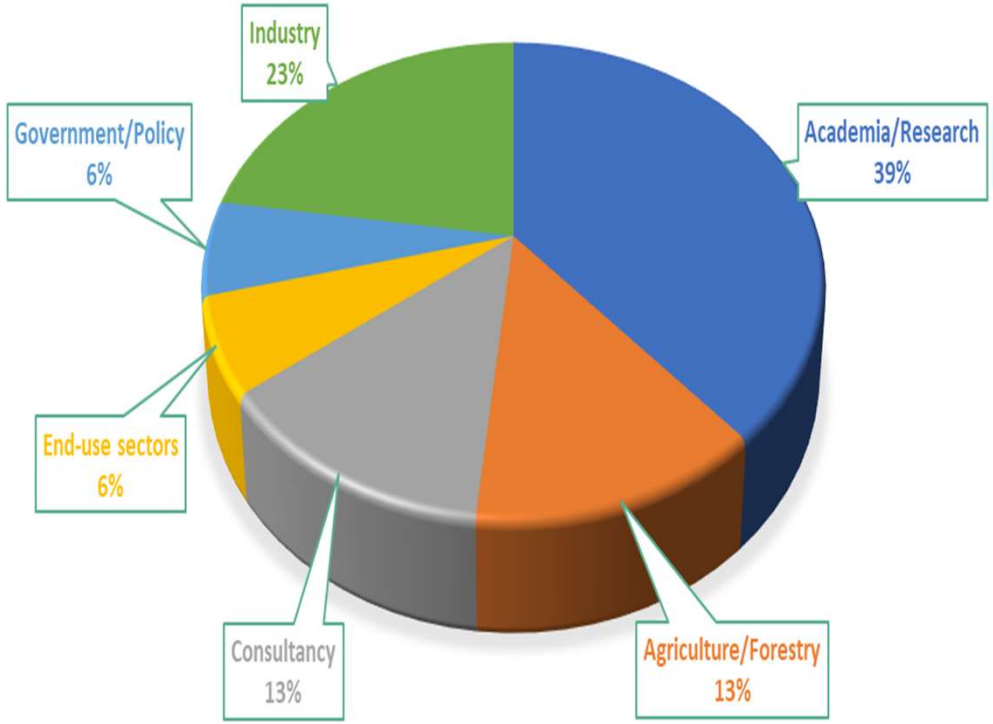
First step: identifying and prioritising the barriers



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

STAKEHOLDER involvement

31 reactions received



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

CONCLUSIONS of the survey and responses from the stakeholders

Feedstock supply

- Lack of clarity on environmental requirements, harmonised regulations regarding sustainable farming practices, sustainable forest management
- High feedstock costs (particularly dedicated energy crops) and difficulty in mobilising feedstocks
  - Stakeholders highlighted the importance of price signals to the farmers and forestry owners.
- Current practices (habits) of the farmers and forest owners restrict production and harvest of needed feedstock

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

Way forward

Feedstock

(suggestions derived from the project work & consultations)

- Sustainability concerns: harmonisation and adaptation of sustainability criteria for innovative farming practices and forest management needed

- Recognition of national initiatives and voluntary schemes on EU level & mutual agreement on definition and measurement of sustainability criteria (proven compliance will increase social acceptance)

- => Providing recommendations for the convergence of existing certification programmes together with the formulation of internationally agreed principles and criteria that are flexible enough to accommodate for the environmental and socioeconomic conditions of different producing countries a production systems (feedstock – conversion combinations) are key in development of these standards and certification systems

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

Way forward

Feedstock

(suggestions derived from the project work & workshop)

- Capacity development among the farmers and forest owners, for instance setting up cooperations to inform/guide
- While price signals are important to mobiles agriculture and forestry residues, innovative approaches are needed to reduce production costs of dedicated energy crops

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

Feedstock

Way forward

- Miscanthus x giganteus: Seed-based establishment has the potential to reduce costs by 50% (rhizome-based planting costs between 3000-4000€/ha) (**Grace**)
- Andes lupine cultivation has a positive previous crop effect since it fixes nitrogen and mobilises soil phosphate (**LIBBIO**)
- Crop selection of low demanding crops (e.g. willow, poplar), and clone selection of high yield as costs and environmental impact decreases with yield
- Cultivation on marginal land - but depends on type of marginality; high yield is still important. (clear definition of marginality and emphasis on biodiversity needs are required for determining the actual potential)
- Increased mid-term and final cutting frequency for woody biomass increases profits (**SEEMLA**)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

CONCLUSIONS of the survey and responses from the stakeholders

Conversion technologies

- Absence of dedicated policy support ensuring stability/ security for the industry
- High CAPEX costs and difficulty in access to project finance
  - Lack of reliable financial support is highlighted as an important obstacle as potential investors are not willing to take the risk involved in establishing rather new businesses/security for the industry
- More accurate data needed for the characterisation of the different types of biomass to further develop pretreatment and conversion technologies

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

Way forward

Conversion technologies

(suggestions derived from the project work & workshop)

- REDII introduces dedicated targets for advanced biofuels resulting in stability and security until 2030
- Financial risks can be reduced with further support of demonstration and 1st of a kind commercial projects from governments and the EC:
  - Since 2015 InnovFin Energy Demo Projects (EDP) provides loans to help bridging the gap between demo and commercialisation
  - 2021-2030: ETS Innovation Fund (IF), successor of NER 300, has a broader technological scope
  - Combination of national support schemes and EU support are required to accelerate the development of conversion technologies

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

Way forward

Conversion technologies

(suggestions derived from the project work & workshop)

- Regarding the targeted assessment of innovative biomass conversion technologies & their integration in existing infrastructure:
  Conversion methods need to be matched to the "feedstock readiness levels"

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

CONCLUSIONS of the survey and responses from the stakeholders

End use

- High production costs and the large price gap with the fossil fuels
- Lack of structural financing mechanisms to bridge the gap
- Car manufacturer's attitude to adapt to new technologies and fuels is limited
- Poor harmonisation of global rules in maritime and aviation
- Stringent fuel qualifications and certification needed in aviation

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

Way forward

End Use

ADVANCEFUEL

- Determine Good Practise scenarios considering the entire value chain (using results of other project‘s case studies)
- Reinforce dialogue with policy relevant sectors (agriculture, forestry, environment, energy, fuels, bioeconomy, etc.)
- Market and policy analysis – resulting in reccomendations on what is needed to promote innovations and facilitate their implementation
- Identify gaps of current policy landscape (e.g. not the right focus on key drivers, pressures and potential impact; lack of relevant regulations or support)
- Development of a numerical tool for the prediction of fuel and fuel blend properties next to model validation to facilitate the end use of RESfuels in the road and aviation transport sector

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

ADVANCEFUEL PROJECT

STAKEHOLDER ENGAGEMENT

To build and validate their results, ADVANCEFUEL partners will engage all stakeholders from the biofuels value-chain and support actors to participate in the project through:

- Stakeholder **consultations**
  (barriers & sustainability schemes)
- Dedicated **workshops**;
- The ADVANCEFUEL **Stakeholder Platform**, to disseminate information and engage dialogue with targeted stakeholders

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

ADVANCEFUEL Workshops

Topic of workshop	Date
Barriers to the market roll-out of RESfuels & Availability of lignocellulosic biomass and its suitability for being converted into advanced biofuels	September 2018; Gothenburg
ADVANCEFUEL - SEEMLA Workshop: Innovative lignocellulosic cropping systems and supply chains	20/21 November 2018, Brussels
Sustainability, certification, standards	May 2019 (at EUBCE 2019) Lisbon
Conversion and technology up-scaling	Sept./ Oct. 2019
End use and policy recommendations	Feb./ March 2020

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

Thank you for your attention

Kristin Sternberg

Agency for Renewable Resources, FNR

k.Sternberg@fnr.de