



## TECHNOLOGY COLLABORATION PROGRAMME ON **ADVANCED MOTOR FUELS**

**IEA Bioenergy**



The contribution of Advanced Renewable Transport Fuels to  
transport decarbonisation in 2030 and beyond

Proposal for a joint AMF, Bioenergy and EC activity

First draft 29.10.2018

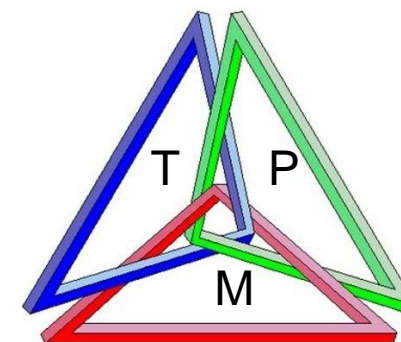
Nils-Olof Nylund, Kai Sipilä & Magnus Lindgren

# Motivation

- The vast majority of the world legacy road vehicle fleet (more than 99 %) and even the majority of new vehicle registrations in 2018 (more than 95 %) are still powered with ICEs.
- There is certainly a future for the sophisticated ICEs using clean-burning, advanced renewable fuels.
- Many countries already have ambitious targets for transport CO<sub>2</sub> reductions for 2030.
- It is quite clear that these ambitious targets cannot be met without significant amounts of renewable, low-carbon fuels.
- Here and now, alternative fuels such as methane, alcohols and paraffinic diesel can bring down local emissions and improve quality of living.
- Engines especially tuned for particular advanced, alternative motor fuels can display improved efficiency as well as reduced emissions

# Objective

- Bring together the expertise of IEA AMF, IEA Bioenergy and national experts to showcase the role of advanced renewable transport fuels to transport decarbonisation in 2030 and beyond.
- Analyse national strategies for transport decarbonisation.
- Identify possible challenges and hurdles for the implementation of advanced renewable transport fuels
- The project will assess the potential of ART Fuels from three different angles:
  1. Policy
  2. Markets
  3. Technology(Markets and technology partly overlapping)



## Policy

- Strategies for transport decarbonisation and introduction of alternative fuels, with targets for CO<sub>2</sub> reductions up to 70 %
  - Individual countries and states
  - Regions and continents (e.g., EU, US Federal)
- Combinations of energy efficiency, electrification and renewable liquid and gaseous fuels
  - Potential and contributions of individual measures
- When available, serious assessments of cost implications to consumers, various sectors of economy and state economy
- Update on most recent IEA scenarios, actions needed to meet the targets of the Paris agreement and recommendations of the IPCC

## Markets

- Current status of conventional and advanced biofuels/renewable fuels and projections towards 2030 (volumes)
- The need for renewable fuels to reach the CO2 emission reduction targets in various countries (in addition to other measures such as energy efficiency improvements, electrification and smart transport systems)
- Main fuels/products in road transport country by country and technology by technology (ethanol, renewable diesel, synthetic petrol, methane, hydrogen)
- Renewable fuels for aviation and shipping

## Technology

- Production of fuels
  - Projections for advanced renewable fuels towards 2030, challenges and bottlenecks related to feedstock and processing technologies
  - Assessment of investment and production costs
  - Mills under construction and under consideration
  - Technologies and facilities needed to reach the 2030 targets
- End-use
  - Projections for vehicle technology towards 2030
  - Can advanced renewable fuels alleviate air quality problems on markets with less sophisticated vehicle technologies?
  - Progress in fuel standards
  - Can the vehicle fleet accommodate sufficient volumes of renewable fuels?
  - Balance between conventional alternative fuels (e.g., ethanol and methane) versus drop-in type fuels



## Target countries

- 5 – 7 countries/markets to be analysed in-depth:
  - European Union
  - Sweden (target to reduce CO<sub>2</sub> emissions by 70 % in 2030)
  - Finland (target to reduce CO<sub>2</sub> emissions by 50 % in 2030)
    - Detailed impact and cost assessment available
  - India (target 20 % ethanol in petrol and 5 % biodiesel in diesel by 2030)
  - Xx
  - Yy
  - Zz

## Expected outcome

- Description of the important role of advanced renewable transport fuels in decarbonisation of transport in selected countries and markets (e.g., Finland, India, Sweden, EU)
- How much renewable fuels will be needed to meet the targeted emission reductions, what share of the reductions will come from renewable fuels
- What are the most significant challenges and bottlenecks (feedstock, processing technology, costs, capacity build-up) in bringing advanced renewable transport fuels to the market)
- Within biofuels and renewable fuels, what could the share of advanced renewable fuels be in 2030
- How much ethanol can the vehicle fleet accommodate in 2030, what other types of renewable fuels are needed (e.g., drop-in type fuels)
- Recommendations for speeding up deployment of advanced renewable fuels



# Expert/steering group

- Lars Waldheim (process technology)
- Ilkka Hannula (process technology, electrofuels)
- Luc Pelkmans (IEA Bioenergy)
- Dina Bakovsky (IEA AMF, IEA Bioenergy)
- Anders Røj (end-use)
- Seppo Mikkonen (end-use, fuel standards)
- Vijay Sharma (India)
- Subodh Kumar (India)
- Kai Sipilä (Finland)
- N.N. (Sweden)
- Kyriakos Maniatis (EC)

# Implementation

- The task will be a joint undertaking by IEA Advanced Motor Fuels and IEA Bioenergy
- The task will be carried out combining cost and task sharing
  - Task sharing for providing information country by country
  - Cost sharing for an Operating Agent responsible for running the total project, collating information and producing an overall report
  - Cost sharing for bringing in selected experts to support the project
- Estimated overall budget 220,000 €
  - Cost sharing contributions 120,000 € (80,000 € from the EC)
  - Task sharing contributions 100,000 €