

Dr Ric Hoefnagels answers questions as to what is at stake for the market roll-out and sustainability criteria of biofuels in the transport sector around Europe

The biggest barrier to the European roll-out of sustainable aviation fuel is costs



Towards sustainable advanced biofuels

What is essential for the market roll-out of advanced fuels in terms of feedstock for the aviation, maritime and road transport markets?

The most prominent barrier to the market roll-out of advanced biofuels is its high production cost compared to fossil fuels and also conventional biofuels. Technical innovations and economies of scale can still substantially reduce the production cost of advanced biofuels, but feedstock costs remain prominent and in some cases contribute to well over half of total fuel production costs.

Furthermore, erratic

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feedstock supply, in terms of volume and quality, reduces capacity utilisation and increases the operational and financial risks of the production plant. Reliable, consistent, and cost-effective feedstock supply chains that are resistant to inclement weather, regional price volatilities, and risks

of impurities are, therefore, essential for developing advanced biofuels at commercial scale.

What role does sustainability criteria play in the market roll-out?

The market for advanced biofuels is still in its infancy but might grow substantially

if climate targets – as agreed upon in Paris in 2015 – are pursued. Similar to the existing markets of bioenergy (conventional biofuels, heat and power), increasing efforts are required to ensure sustainability is implemented over the whole supply chain when these markets develop. These efforts are needed regardless if it is sourced and produced domestically from within the EU or imported from third countries. Policymakers and investors need the assurance that environmental, social, and economic risks are properly addressed to support the

development of credible and accepted advanced biofuels. Institutional frameworks with strict criteria and independent third-party certification are both important instruments to ensure sustainability along the whole supply chain.

How do you develop sustainable advanced fuels on a regional level?

Sustainable biomass sources could be available, but that does not necessarily mean that they are readily available to produce advanced biofuels at commercial scale. Production requires a well-functioning infrastructure and the engagement of all actors in the supply chain, including farmers, foresters and other feedstock suppliers, biomass traders and logistics, certifiers, governments and NGOs. The required actions to develop reliable, consistent, and cost-effective feedstock supply chains are location and context-specific. A forest-based supply system in northern Europe is very different from a system based on agricultural residues in central Europe or an import-oriented supply chain in Europe.

What are the implications of deploying sustainable biomass for advanced biofuels?

Today, liquid biofuels and solid biomass are individually embedded in different sectors of the economy. Liquid biofuels are produced from

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agriculture commodities such as rapeseed and residues such as used cooking oil. Solid biomass fuels are largely sourced from forests and forest industries and supplied to electricity and heat sectors. With the development of advanced biofuels, we expect a convergence of these markets.

Solid biomass could partly shift from heat, electricity, and non-energy end-use markets towards advanced biofuels. Secondly, advanced biofuels will likely be produced in multi-output facilities with cogeneration of heat or electricity. Thirdly, the growth of solid biomass demand could lead to a convergence of agriculture and forest biomass supply markets by an increased mobilisation of agricultural

residues and the cultivation of lignocellulosic woody and grassy crops. Finally, the development of advanced biofuels could further stimulate the internationalisation of the bioenergy market due to the growth of renewable fuel demand in international marine and aviation sectors and international trade of solid biomass and advanced biofuel commodities. These converging trends increase the need for harmonised and internationally-recognised standards and certification schemes. The principles and criteria should remain flexible enough to accommodate for the environmental and socio-economic conditions of different producing countries and supply chains.

How does ADVANCEFUEL assess the environmental and socio-economic performance of renewable fuels supply chains?

The ADVANCEFUEL project has a dedicated work package on sustainability. On the one hand, the research aims at quantifying the possible environmental and socio-economic performances and impact of advanced biofuels; on the other hand, the research identifies actions needed to safeguard more sustainable

production of advanced biofuels with effective criteria and certification. To meet these objectives (among others), a spatial explicit modelling tool is being developed, stakeholder interviews are being conducted and workshops are being organised to identify sustainability concerns and options to develop harmonised sustainability criteria and their application in standards and certification systems.

How are advanced fuels going to develop by 2030 in the different end-use markets of aviation, road, and maritime transport?

The development of advanced biofuels in the EU is likely to be shaped by the sub-target for advanced biofuels. Under the revision of Directive 2018/2001/EU (recast RED II), 0.2% of final energy consumption in road and rail transport should be supplied from advanced biofuels by 2022 increasing to 2.2% by 2030 (single counted). No blending requirements are set for the maritime and aviation sectors. Nevertheless, renewable fuel consumption is stimulated by a multiplier of 1.2 times the energy content towards the road and rail target if renewable fuels are used in these sectors.

An analysis by Utrecht University and TNO has demonstrated that such a multiplier could shift significant amounts of biofuels towards aviation, despite the more strict fuel quality requirements and associated production cost if used in aviation. The ADVANCEFUEL project will provide more detailed and up-to-date analyses of possible deployment pathways of advanced biofuels and associated end-use markets. ●

For more information:

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