



Innovation in the bioeconomy

Overcoming barriers for sustainable bio-based products and biofuels

Sustainable biomass can be used in a wide variety of applications, including heating, transport fuel, or bio-based products, and present an area with strong growth potential in the European economy. Making products and energy from renewable, local bio-resources instead of fossil fuels will stimulate the creation of new jobs and economic growth in Europe, particularly in rural areas, whilst also reducing carbon emissions and fossil fuel imports. However, numerous barriers remain to the wide-scale roll-out of biofuels and products. On 12 April, the **ButaNexT** project held an event to discuss how the regulatory framework and market barriers that impact the widespread uptake of products derived from sustainable biomass. The project has explored how to make it cheaper and less energy-consuming to produce bio-butanol, which can be used as a biofuel or to make bio-based products.

Current Framework – Biofuels and bioenergy are supported in the Renewable Energy Directive (RED) with an upcoming revision (RED II) to be finalised in 2018. RED II will propose new sustainability criteria for bioenergy and introduce new measures for promoting innovation in the transport sector, including a proposal of a 6.8% obligation for low-carbon and renewable fuels in transport. Concerns over ‘first generation’ ‘food-based’ crops have led regulators to insist on sustainability of biofuels, with the 2015 Directive on Indirect Land Use Change (ILUC) aiming to limit the contributions of first generation biofuels and reduce their contribution from 7% of fuels (2020 target) to 3.8% by 2030. The difference should then be made up with second generation, advanced biofuels. Whilst these targets are a good first step, greater ambition needs to be shown, and more efforts are needed to overcome existing market barriers. Whilst this framework exists for biofuels, the support framework for bio-based products remains substantially underdeveloped. The Bioeconomy Strategy was launched in 2012 to provide some incentive to the development of the European bioeconomy, and a revised strategy will be launched by the end of 2018.

Barriers – The ButaNexT panel discussion on barriers to biofuels and bio-based products was made up of Ayla Uslu from ECN/TNO, representing the ADVANCEFUEL project, Tim Davies from Green Biologics, Mathilde Crêpy from ECOS, and Petri Ihalainen from MetGen. The session began with a presentation of the ADVANCEFUEL project, which has identified a set of barriers to the uptake of advanced biofuels which are also applicable to bio-based products:

Feedstocks are the basis of all bio-based products, and ensuring consistent, quality supply of sustainable feedstock is a key challenge for achieving high impact for bio-based products. Sustainable biomass can include by-products and residues from other processes (such as sawdust, wood chips or agricultural prunings), and dedicated crops. These biological resources can be difficult to mobilise from rural regions, which are often remote and may lack infrastructure. High costs of pre-treatment, storage and transportation add to the challenges for those wishing to use these resources, and a lack of clarity regarding environmental constraints results in slow and cautious uptake.

Conversion processes are limited by the challenges of handling multiple different resources and the low current efficiency of conversion technologies. High capital investment requirements also limit development of conversion technologies, and project funding is difficult to access. There is also a lack of a long-term policy framework for upscaling and rolling-out conversion technologies.



End-use of biofuels requires development of infrastructures, requiring the involvement of many actors. Customers often have low awareness of the benefits of biofuels, and some may actively be against them due to sustainability concerns about indirect land use change and the use of food crops as a biomass resource. Whilst a target has been set for the use of biofuels in road transport, no target has been set for aviation and maritime scenarios; two large sectors of the transport industry.

The panel discussed what they considered to be the main barriers, with particular concern expressed over high feedstock costs, low quality of feedstock, and immature conversion technologies. Significant concerns were also expressed over the difficulties of acquiring project finance, where conversion plants requiring large investments, but investors are reluctant to become involved whilst the economic benefits are not yet proven.

The panel discussed how some of these barriers can be overcome, and made a number of recommendations for strengthening the bioeconomy. Firstly, it was discussed that the sector is developing, with bio-refineries focusing on higher value products, produced at smaller volumes. We can expect that over time the knowhow and knowledge will trickle down to other lower value sectors, enabling efficient scaling-up of conversion processes to reach the scale needed for biofuel roll-out.

The panel then discussed the role of standards in changing markets, arguing that unsustainable products are a market failure because costs are passed to the environment and to citizens and not represented in the cost of the product. Product policies should be used to correct these failures by both granting access to markets for greener products, and also empowering consumers and procurers to make more informed choices. Currently, however, standards for bio-based products are focused on feedstock sustainability, such as the sustainability criteria for biofuels, but they do not compare performance with conventional products.

Key Messages & Recommendations – Throughout the course of the panel discussions, the following points were raised and discussed on how to increase the market penetration of bio-based products and biofuels:

- Political framework must remain consistent. Whilst European states and the European Union have signed up to the Paris Agreement, actions are not ambitious enough to achieve the stated aims;
- Targets set for road transport need to be more ambitious, and targets have to be set for the maritime and aviation sectors;
- A carbon tax, recognising the environmental costs of fossil fuels, would correct the market failures that limit uptake of biofuels;
- The EU needs to take a 'big picture' approach to the bioeconomy, and ensure that the update to the bioeconomy strategy includes clear targets, and actions, with suitable regulations in different sectors. The uptake of bio-based products and biofuels are also affected by regulations regarding transport, products, food, and energy, and the strategy will not succeed without joined-up policy-making;
- More financial support is needed for the maturation of conversion technologies, to make advanced biofuels cost competitive against fossil fuels;
- Governments need to take account of the potential of the bioeconomy, mapping their resources and economic potentials. This includes looking for, and fostering, industrial symbiosis, where wastes and residues from one company can be a resource for others;
- Public procurement should support the purchase of bio-based products and help the market to grow;
- Eco-design and product labelling requirements should be used to drive market development of bio-based products. Even voluntary labelling schemes can be a driver for companies that make bio-based products, by enabling consumers to make informed choices.

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