

## Accelerating the deployment of biofuels is crucial to decarbonize global transport sectors

November 21, Stockholm. IEA Bioenergy

*There are major challenges to reach a climate neutral society by 2050, as expressed in IEA's Net Zero by 2050 roadmap. Among different sectors, transport is proving to be a very difficult sector to decarbonize. It implies moving away from established fossil fuels through electrification and using renewable fuels instead of fossil fuels. One of the key tools in the short to medium term is to accelerate the deployment of sustainable biofuels.*

IEA Bioenergy is committed to advancing bioenergy technologies based on sustainable biomass feedstocks for a greener and sustainable future. With the world facing a worsening climate crisis and emerging energy security issues with fossil fuels, finding effective solutions to phase out fossil fuels in the transport sector is crucial, and biofuels offer a compelling option, in synergy with electrification. The recently published reports from the IEA Bioenergy study “*Assessment of Successes and Lessons Learned for Biofuels Deployment*” highlight the potential of biofuels to drive significant market supply, replace fossil fuels, and combat global warming. The main target of the study was to identify key factors for technology successes and the best policy framework conditions for stimulating increased future markets for sustainable transport biofuels.

Tomas Ekbohm, Svebio (Sweden), Project Leader: *“The current production capacity of renewable fuels, needs to grow by a factor of around 10 to produce the renewable fuels, i.e. biofuels and hydrogen based e-fuels, that will be required worldwide by 2050. We need faster progress and learn lessons from biofuels deployment so far to support their further deployment in an efficient way.”*



Biofuels present cost-competitive options to reduce greenhouse gas emissions in the road transport sector over the next decades to come. **Their compatibility with existing fossil fuels infrastructure makes biofuels a practical and much needed immediate solution to replace fossil fuels in existing fleets.** While electric vehicles are making progress in several regions of the world, particularly for light duty vehicles, access to materials for large scale battery manufacturing and underdeveloped charging networks will challenge the speed of their widespread adoption. In the medium to longer term – with increased electrification of the road transport sector - the use of biofuels will shift to difficult-to-electrify sectors such as aviation and marine shipping.

While most current biofuels are produced from agricultural crops like sugar cane, corn, or oil-based crops, the focus is now moving to the use of biogenic waste, crop residues and non-food crops, many of which require advanced biofuel production technologies. Yet, at this point most advanced technologies are at an early stage of commercialization and economics are still a challenge. In order to sharply reduce fossil fuel consumption, we don't have the luxury to abolish existing biofuel options and wait for new technologies to mature; restrictions on some (crop-based) biofuel feedstocks may

have to be rethought, especially where they can be sustainably produced, with very low greenhouse gas emissions over their life cycle. We also need to recognize that biofuel options are and will continue to be region- and country-specific.

Heitor Cantarella, Agronomic Institute of Campinas (Brazil): *“Liquid biofuels like ethanol and biodiesel, that can directly replace fossil gasoline and diesel, offer mature, scalable alternatives for markets with dominating shares of combustion engine vehicles. Driven by sustainability requirements in effective policies, these fuels have demonstrated low carbon footprints and limited impact on food production.”*



Key learnings from the project:

### **Combine market-pull and technology-push policies**

Ambitious strategies and targets do not automatically create a frame that allows increasing or building up innovative technologies along the value chain.

Franziska Müller-Langer, DBFZ (Germany): *“We looked at case studies of advanced biofuels in Germany, Sweden and Canada. Several advanced biofuels have shown technical success; however, this doesn’t guarantee the required commercial success. To achieve both technology development and market uptake, we need a combination of policies to push technology developments and pull market demand; a comprehensive monitoring of the impacts of these policies is necessary as well. We also need steering instruments to secure financing in order to lower the risk of investments and plant operation of relatively new technologies.”*



### **Improve established biofuel options AND support innovative biofuel solutions**

Decarbonization of the transport sector needs a transition process that allows starting with promising technology options, allows gaining experience and learning lessons for continuous improvement. There is no time to wait for optimal options that might check all the boxes from the very beginning. It is necessary to continuously work on harmonized clear long-term policies that allow improvement of established biofuel options as ground base for decarbonization in transport. At the same time R&D support for innovative advanced biofuels is urgently needed to broaden the biomass feedstocks that can be used, and achieve even better climate performance, e.g. through the combination of biogenic CO<sub>2</sub> from the process with renewable hydrogen.

### **Consider the full value chain, from biomass resources to fuel applications**

To stimulate biofuels development actions are needed in the field of resource mobilization and logistics, biofuel production technologies, infrastructure and trade, and appropriate norms and standards for innovative technologies. Cost-effective, reliable and sustainable feedstock supply chains are crucial to a successful development of advanced biofuels. Advanced biofuels will develop in an increasingly internationalized market with respect to tradeable feedstocks as well as international end-use markets such as shipping and aviation. The carbon intensity of fuels, including biofuels, is becoming an increasingly relevant metric in the transportation sector. Sustainability certification schemes are important to provide transparency and verification of the performance of biofuel value chains.

Based on the IEA Bioenergy study ‘Assessment of Successes and Lessons Learned for Biofuels Deployment’. Reports and key conclusions are available at: [ieabioenergy.com](http://ieabioenergy.com)

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**ACCELERATING TO NET ZERO**

**Andrea Rossi**

**Secretary**

Email: [a.rossi@biosmartstrategies.com](mailto:a.rossi@biosmartstrategies.com)

Phone: +39 340 392 0625