

PRESS RELEASE

Biomass Demand for Transport Fuels, Aviation and Shipping up to 2050 and Implications for Biomass Supply to the Chemical Sector

Current transport regulations provide a unique long-term horizon for sustainable aviation and shipping fuel through the defined quotas – what does this mean for the chemical sector?

Hürth, 21 January 2025: Following the Green Deal, the EU is leading the way in transforming its transport sector towards climate neutrality. The current transport regulations provide a unique long-term horizon for sustainable carbon-based fuels in aviation and shipping through the defined quotas, in particular for biomass covered by Annex IX, and synthetic CO₂-based fuels. A new report by the Renewable Carbon Initiative (RCI) develops and analyses three future scenarios for carbon-based fuel demand until 2050 – each a possible development under current policy rules. The results visualise that the demand for second-generation biomass biofuels will increase significantly, mainly due to the increasing quotas set for aviation fuels and shipping. This projection not only highlights potential risks to the ecological balance and resource sustainability that need to be managed carefully, but also poses significant barriers for other sectors that require renewable carbon to defossilise their products. In particular, the chemicals and materials sector has to rely on biogenic and captured carbon as a feedstock in the long term. But in direct competition with the fuel sector and without comparable regulatory incentives, the sector will have severely limited access to second-generation biomass and captured carbon. However, the production of bio-based and synthetic fuels can also support the development of renewable carbon in chemicals, as some by-products of their production can be used as a chemical industry feedstock.

RCI commissioned experts from the nova-Institute (Germany) to prepare this report. It contains 11 tables and 9 graphics, as well as a detailed description of the latest fuel regulations in the European Union, which are of high value to stakeholders from other sectors with demand for biomass and CO₂ utilisation. Although the focus is on Europe, the report also includes global scenarios and analysis. The main findings and conclusions are summarised below, for detailed analysis please see the report. You can download the full report for free here: <https://renewable-carbon.eu/publications/product/eu-and-global-biomass-demand-for-transport-fuels-aviation-and-shipping-up-to-2050-and-implications-for-biomass-supply-to-the-chemical-sector-pdf/>

The existing transport regulation directs second-generation biomass to aviation and shipping

In the current European regulatory situation, the chemical sector will not be able to compete with the SAF sector for second-generation biomass (Annex IX), because the binding quotas mean that SAF producers are willing to pay much higher prices for the same biomass. The high demand from the transport sector is likely to absorb almost all available second-generation biomass, with prices rising with demand, severely limiting the availability of second-generation biomass for use in the chemical sector.

A higher share of synthetic fuels, beyond the mandatory shares, could reduce the competition for bio-based feedstocks, and allow some of the second-generation biomass to be used in the chemical industry, thus creating a more level playing field.

There are significant potential synergies between transport and material sectors

The production of biofuels generates a number of valuable co-products that could be made available to the chemical industry. For example, the by-product of Fischer-Tropsch Sustainable Aviation Fuels (SAF) production is high-quality naphtha – with a share about 15% a perfect feedstock for steam crackers in the chemical industry. The modelling showed that, depending on the future technology mix, approximately 1 to 2 million metric tons of bio-based naphtha could be expected as a side-product of bio-based SAF production, within the already calculated biomass demand for SAF. Securing these streams for the chemical industry can help ensure that synergies between the sectors are fully exploited.

Industrial biomass utilisation should be based on scientific, objective arguments which include land-use efficiency

The objectively questionable exclusion of food and feed crops from future aviation fuels provides an opportunity to use these crops for the chemical sector. Reduced demand for food and feed crops from road transport allows the chemical sector to use more food and feed crops without additional land. Ethanol and biodiesel plants could be maintained and transformed into feedstock suppliers for the chemical industry, preserving the substantial existing infrastructure, innovation and employment that was created over past decades through significant investment. Modelling shows that it is possible to increase the supply of starch, sugar and vegetable oil to the chemical industry in 2050 under a moderate high-tech scenario without compromising food security, sustainability and biofuel/SAF production. Changing the image of the use of food and feed crops in industry and gaining long-term political acceptance would not only follow the scientific arguments, but would also support the chemical sector on its path towards defossilisation and sustainability.

Electrification of the transport system in combination with transforming carbon-reliant industries enable a sustainable system that utilises biomass

Combining the decarbonisation of energy and transport with the defossilisation of carbon-dependent sectors offers a holistic approach to sustainability. This integrated strategy creates a net-zero vision that encompasses the widespread adoption of electric vehicles alongside the transformation of carbon-dependent sectors like aviation and chemicals. Such an approach would minimise carbon demand in transport while establishing sustainable carbon cycles in industries that inherently require carbon. Moreover, it opens up opportunities for innovation and prompts a re-evaluation of using food crops in chemicals and materials production.

The future transport fuel mix will be significantly influenced by the ambitious regulatory framework in the EU, leading to significant and increased demand for bio-based and CCU-based carbon feedstocks. Ensuring a sustainable supply of second-generation biomass to meet the high demand for biofuels, particularly in aviation, while balancing the needs of the chemical industry, will require further strategic policy interventions to ensure a level playing field, enforce a circular economy and aligning the policies with the principle of cascading use. A holistic approach to these challenges is essential to ensure sustainable and resilient transport and chemical industries for decades to come. By addressing these interconnected challenges simultaneously, a more cohesive and sustainable industrial ecosystem can be created, balancing the needs of various sectors while moving towards a defossilised future.

“Our research reveals a critical need for balanced policies that support both the transport and chemical sectors in their transition to renewable carbon sources,” says Michael Carus, Executive Manager of the Renewable Carbon Initiative. *“Without coordinated and strategic approaches, we risk creating unintended barriers for the chemical industry’s defossilisation efforts.”*

The findings of this report underscore the urgent need for policymakers, industry leaders, and stakeholders to collaborate on carbon management by developing a holistic approach to renewable carbon and its allocation. We call on EU legislators to consider these insights in upcoming policy reviews, and invite industry players to engage with RCI to explore innovative solutions. Download the full report to learn more about how we can create a sustainable future for both the transport and chemical sectors.

Disclaimer

RCI members are a diverse group of companies addressing the challenges of the transition to renewable carbon with different approaches. The opinions expressed in these publications may not reflect the exact individual policies and views of all RCI members.

About RCI

The Renewable Carbon Initiative (RCI) is a global network of more than 60 prominent companies dedicated to supporting and accelerating the transition from fossil carbon to renewable carbon (bio-based, CO₂-based and recycled) for all organic chemicals and materials. Its work focuses on scientific background reports, position papers, advocacy and networking.

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