

Joint briefing: Recycled Carbon Fuels in the Renewable Energy Directive

The revised Renewable Energy Directive¹ (REDII) establishes a common framework for the promotion of energy from renewable sources in the electricity, heating and cooling, and transport sectors for the 2021-2030 period.

As a part of the transport target, Member States may choose to include “recycled carbon fuels”. The REDII includes liquid and gaseous fuels that are either produced from liquid or solid waste streams of non-renewable origin or from waste processing gas and exhaust gas of non-renewable origin as part of the definition of “recycled carbon fuels”². This means that fuels derived from non-renewable waste streams e.g. fossil waste (plastic, rubber, gaseous wastes etc.) could be promoted through transport targets and support schemes, but could not be considered under the overall renewable energy target.

This briefing highlights key concerns and recommendations to ensure that the RED II is implemented in a way that decarbonises transport fuels in a sustainable manner.

Needed sustainability criteria for recycled carbon fuels

At this stage, the EU sustainability rules for recycled carbon fuels have not been completely finalised. The rules have been largely left to delegated acts, the last of which is due by the end of 2021. Even though Member States have the option to include Recycled Carbon Fuels into their national frameworks, this decision would be based on unknown criteria, and should not be made before the last delegated act is published. We therefore recommend that Member States do not include Recycled Carbon Fuels into their national targets until a proper evaluation of their environmental impact is made by 2021.

Despite their fossil origin, recycled carbon fuels will still be evaluated in the Renewable Energy Directive under a delegated act. In the context of this evaluation, we urge the European Commission to incorporate the following criteria into their assessment:

1. GHG emissions savings need to be at least 70% compared to fossil fuels; the same threshold is applied for Renewable Fuels of Non-Biological Origin (RFNBO). To ensure that all of the emissions related to these fuels are taken into account, the GHG accounting must include all stages of the lifecycle of the product. This includes the emissions related to the energy inputs, to the production, and to the use or combustion of the fuel.
2. Energy inputs need to be counted in a similar way as electricity and fossil energy inputs are calculated for biofuels when determining their GHG performance. For electricity inputs similar provisions to those identified for RFNBO should be considered.
3. The CO₂ reductions should not be counted as abatement twice (e.g. both under EU ETS and the transport sector).
4. Any potential support to recycled carbon fuels needs to be fully in line with other environmental and climate policies (e.g. ensure that efforts to improve recycling are not jeopardised).

Given the unknown availability of the suitable waste streams, and potentially decreasing sources, these fuels will not be a game changer in transport emissions reductions, and are incompatible with a renewable and carbon free transportation system.

¹ https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.328.01.0082.01.ENG&toc=OJ:L:2018:328:TOC

² ‘recycled carbon fuels’ means liquid and gaseous fuels that are produced from liquid or solid waste streams of non-renewable origin which are not suitable for material recovery in accordance with Article 4 of Directive 2008/98/EC, or from waste processing gas and exhaust gas of non-renewable origin which are produced as an unavoidable and unintentional consequence of the production process in industrial installations

Case study on Municipal Solid Waste specific fuels

1. Fossil waste should not be credited as low-carbon

Fuels derived from fossil waste will never be low-carbon and are therefore at odds with efforts to bring Europe's carbon footprint to zero.

Some manufacturers claim that their fuel cuts the emissions of conventional, diesel or petrol fuel in half. However, studies on fuels have shown that there is a correlation between the amount of fossil waste and the carbon footprint of the fuel. Put simply, the more fossil waste there is in municipal solid waste turned to fuels, the worse their climate impact will be.

When municipal solid waste containing 65% of non biogenic waste (mostly plastic) is turned into fuel, the emissions range between 52,6 gCO_{2eq}/MJ to 124,6 gCO_{2eq}/MJ³. When all of the waste going into the fuel production process is non-renewable, these figures increase, **making the impact worse than that of conventional diesel, petrol or kerosene**⁴. Even if there are some reductions in emissions, they range from 1-14% compared to conventional fuels⁵. **This reduction is far below the EU requirement for other renewable transport fuels.** Recycled carbon fuels do not deliver the reductions needed to reach emission reduction targets or net-zero emissions by 2050.

Considering that the GHG savings, as well as the methodologies to count them, are uncertain, the decision to include RCF should happen earliest in 2022, after the delegated act on GHG methodology (due end of 2021) and the required savings threshold (January 2021) have been published.

2. Waste to fuel could compete with mechanical recycling

The definition of "recycled carbon fuels"⁶ intends to guarantee that what can be recycled mechanically won't be used for waste to fuel applications, **in line with the waste hierarchy⁷ in the waste framework directive.**

However, as there is no definition of mechanical recycling, authorities have no way to determine which wastes are mechanically recyclable. Therefore, the RED II prescribes that anything that can be recycled mechanically is recycled in that fashion, but it offers insufficient guarantee that this waste will not actually be turned into fuel.

For instance, only a couple of plastics are more or less successfully recycled right now, such as HDPE and PET bottles and flasks through selective collection. These plastics and other possibly recyclable plastics, could still very well end up in mixed waste streams which would be considered economically "unrecyclable" and there is no basis for an authority to contest it.

Furthermore, if the RED II does not provide adequate environmental safeguards, businesses will be stimulated to add non-renewable fuels from waste to a fuel mixture. The EU currently lacks a

3 Suresh 2016, Environmental and economic assessment of transportation fuels from municipal solid waste
<https://dspace.mit.edu/handle/1721.1/105567>

4 Ahlgren and Eriksson 2013, LCAs of petrol and diesel: a literature review
https://pub.epsilon.slu.se/10424/17/ahlgren_s_and_eriksson_m_130529.pdf

5 Benavides et al. 2017, Life-cycle analysis of fuels from post-use non-recycled plastics
<https://www.sciencedirect.com/science/article/pii/S0016236117304775>

6 Proposal for a Directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources (recast) 2018,
<http://data.consilium.europa.eu/doc/document/ST-10308-2018-INIT/en/pdf>

7 According to the waste Framework Directive the following waste hierarchy shall apply as a priority order in waste prevention and management legislation and policy: (a) prevention; b) preparing for re-use; (c) recycling; d) other recovery, e.g. energy recovery; and (e) disposal.

similar policy for waste materials. There are no similar EU-wide initiatives to promote the uptake of recycled materials in new plastic products, while mechanical recycling is surely more beneficial from an environmental perspective. Here too, mechanical recycling is at a disadvantage compared to fuels from waste.

Besides, the possibility to count waste to fuel as recycling might incentivise authorities to make use of this technology to reach recycling targets for e.g. plastic packaging. As the new Packaging Waste Directive has set the target at 55% in 2030, there is a concrete risk that the objective is pursued through waste-to-fuel, at the detriment of mechanical recycling.

Therefore, while the intention of this inclusion is possibly in line with the waste hierarchy, the actual implication of it might run against it and could undermine the EU strategy to move towards a circular economy.

3. Incentives for plastics to fuels can prevent new designs for recycling

An important element in moving to a circular economy is to make plastics easier to recycle. As acknowledged by the European Strategy for Plastics in a Circular Economy, the goal is to have plastic products designed for greater durability, reuse, and high-quality recycling. The RED II aims to offer a solution for waste that cannot be mechanically recycled, but these types of waste will decrease in volume as increasing levels of plastics are recycled. As pointed out, this is not a category that is currently clearly defined, but neither is it a static category: e.g. plastics that are difficult to recycle now could be redesigned to make them easier to recycle. The phasing out of certain additives, the use of monomaterials and the bans on specific plastics for specific product groups could help to change plastic products and make them suitable for mechanical recycling. If these plastics are turned into fuel, the incentive to redesign plastic products will be lost. Instead, there will be a lock-in of an inferior technology that produces energy from fossil fuels. Plastics-to-fuels is a step back for the circular economy, which prevents the EU from achieving its ambitious goals under the Circular Economy Strategy, including having all plastics packaging placed in the market reusable or easily recycled by 2030.

Given the risk above, we recommend that municipal solid waste is not used as a feedstock for recycled carbon fuels, as doing so risks undermining the recycling target.

This briefing has highlighted the main concerns regarding fuels derived from non-renewable waste streams in the RED II. As our brief case study shows, the production of these fuels could have harmful effects on both climate change mitigation and circular economy measures.

We therefore urge member states not to include these fuels into their transport targets. In the meantime, due to the inclusion of these fuels in the RED II, we urge the European Commission to develop a set of robust environmental criteria that ensure the impacts of these fuels are accounted for properly.

The **Bellona Foundation** is an independent non-profit organisation that aims to meet and fight the climate challenges, by identifying and implementing sustainable environmental solutions. We work towards reaching a greater ecological understanding, protection of nature, the environment and health. Bellona is engaged in a broad range of current national and international environmental questions and issues around the world.

Zero Waste Europe is the European network of communities, local leaders, businesses, experts, and change agents working towards the same vision: phasing out waste from our society. We empower communities to redesign their relationship with resources, to adopt smarter lifestyles and sustainable consumption patterns, and to think circular.

Further information:

Ana Serdoner, Bellona: ana@bellona.org

Janek Vahk, Zero Waste Europe: janek@zerowasteurope.eu