

6 Conditions for Chemical Recycling

Brussels, December 14, 2021 – Ecopreneur.eu, the European Sustainable Business Federation advocates to limit EU support for chemical recycling to applications meeting 6 conditions including being net-CO₂ positive.

As the European Federation of Sustainable Businesses, Ecopreneur.eu believes that the future lies in a sustainable economy which is low carbon, circular, and inclusive. Recycling is key for the circular economy. Circular recycling is one of the options on the table. However, while recognising its potential as a future technology for the circular economy, we advocate to **support the development of chemical recycling only if net-carbon-positive, used for otherwise unrecyclable residues, with maximum quality, scalable, at costs reflecting the waste hierarchy, and matched by equal support for SMEs on circular design.**

Besides closing materials loops, recycling should deliver a net-reduction of the carbon footprint compared to virgin materials. Mono-material products such as PET packaging can already be recycled mechanically, delivering a high quality material for closed-loop applications with a substantial net-reduction of energy use. However, the mechanical recycling of most products and materials is difficult due to their complex composition.

Chemical recycling is regarded as a technology that could deliver solutions for this problem. It is being strongly advocated by certain industry sectors in political stakeholder dialogues, with the aim to place this technology equally next to mechanical recycling. Ecopreneur.eu considers this placing unwarranted in the present situation.

Our concerns with chemical recycling are the following:

- Too strong government support could **prolong the present lock-in in the linear economy** by creating an alibi for continuing business-as-usual. Government policies need to shift activities from waste management to **waste prevention** by fostering sustainable (re)design of products and processes towards longer durability, re-use, improved recyclability and the use of circular business models.
- There are different approaches grouped under chemical recycling, with pyrolysis, gasification and solvent-based the most known. Pyrolysis and gasification are **highly energy intensive** since they are based on a thermal process to convert the materials and use fossil fuels for the heating. **This makes the CO₂ emissions net-positive and therefore at bay with the climate goals** of the European Green Deal. Some stakeholders even deny that chemical recycling is recycling at all, and place it closer to incineration.

- Large investments with EU support based on hyped expectations **will draw away crucial support from SMEs that urgently need it for circular design** of complex products (e.g. mono-material, detachable, repairable, eliminating legacy chemicals). Interested parties are asking for substantial financial R&D support from governments and the EU. The technology can only be developed by large companies.
- If implemented at large scale for treating mixed waste in the future, **the market for mechanically recycled waste will decrease.**
- It is **not (yet) industrially scalable**. The assumption is that it takes 10-15 years to accomplish this. For instance, although there is proof of concept for chemical recycling of mixed plastic packaging, the technology cannot yet be applied for the waste management for mixed fractions at industrial scale. Pre-sorting is therefore necessary – and then mechanical recycling would be the more sustainable solution. In addition, pyrolysis has **significant material losses** compared to the state-of-the-art in mechanical recycling, meaning that large amounts of virgin material replacement will remain needed even at industrial scale.
- The **quality is generally low**. For instance, the oil derived from pyrolysis of mixed plastic waste has to be mixed with crude oil before its conversion into recycled plastics.
- Residues from the process are **highly toxic**. The problem of legacy chemicals needs to be tackled by circular design to create clean cycles as soon as possible.

Ecopreneur.eu therefore advocates to limit EU support for chemical recycling **only to applications and projects that meet all of the following 6 conditions:**

1. **To create a level playing field, the processing costs reflect the waste hierarchy.** Crucially, chemical recycling installations *not* meeting our conditions below should be placed below mechanical recycling and above incineration, with fees significantly higher than for mechanical recycling but lower than for incineration. Existing incentives for incineration and landfill should be removed and inverted as to make landfill the most expensive option until phase-out. Waste now going to landfill should preferably be diverted to mechanical recycling or safely stored for later treatment rather than be incinerated or chemically recycled.
2. **Exclusively applied to products, materials, waste and residues that cannot be reused or recycled mechanically or otherwise.**



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3. **Net-carbon-positive (e.g. by using renewable energy).** Multi life cycle thinking is required for evaluation and comparison.
4. Providing **maximum quality, especially for closed-loop applications**, as to prevent the use of chemical recycling for downcycling when upcycling or recycling is possible.
5. **Industrially scalable:** the technology should be applicable at industrial scale to achieve **maximum quantity** with the desired impact in the market, namely the **reduction of virgin materials** use.
6. **The support is matched by full and immediate EU support for design for circularity, especially for sustainable SMEs, e.g. via regional circularity hubs.** Rather than resorting to chemical recycling, product innovation with design for circularity, especially in combination with improved automated sorting, can help making mechanical recycling of many products and materials more feasible and more sustainable.

In conclusion, Ecopreneur.eu considers chemical recycling as **only one element of the transition towards a sustainable economy**. Currently chemical recycling cannot be perceived as a sustainable technology. It could one day become a trouble-shooter-solution for any remaining unrecyclable applications and replace incineration.

Literature

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ABOUT ECOPRENEUR.EU

Ecopreneur.eu is the European Sustainable Business Federation of currently seven national associations representing about 3000 sustainable companies - mostly SMEs. We show best practice examples, bring concrete experience from our companies into the political debate and represent their needs. Ecopreneur.eu is the *only* cross-sectoral EU business organisation advocating ambitious measures, rules and regulations to create a new framework for a sustainable economy.

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