JOINT STATEMENT

CHEMICAL RECYCLING

7 STEPS TO EFFECTIVELY LEGISLATE ON CHEMICAL RECYCLING

ECOS

ZERO WASTE EUROPE

RETHINK PLASTIC

Health Care Without Harm

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The concept of 'chemical recycling' has been promoted by the industry for decades,[1] including as a solution to the current plastic crisis.[2] The industry has been claiming that chemical recycling technologies are able to treat plastic waste that is currently not recovered through mechanical recycling,[3] thus enabling an entirely circular economy in plastic.[4] Yet, **a recent research review[5] highlights the limits of these technologies to deal with plastic waste** (such as the need for a pure feedstock, the need for further treatment of by-products, high loss of feedstock carbon in the process, etc.) **and the high energy consumption requirement of these processes**. Moreover, **the environmental and health impacts of these technologies and corresponding outputs are still largely unknown**.[6] Finally, and most importantly, the wording **"chemical recycling" seems to be used misleadingly** for both (very few) technologies aimed at recovering polymers, and others (the vast majority) which actually produce hydrocarbons which can be (and are) used as fuels. Whilst the former ("plastic to plastic" or "repolymerisation") may be considered as a way to "recycle" (subject to conditions considered hereafter) the latter **("plastic to oil/gas") is equivalent to 'recovery'[7] and should never be considered as "recycling"**, from a strategic, operational and regulatory standpoint.[8]

An increasing number of projects[9] and policies[10] appear to be promoting chemical recycling, while the technologies are still surrounded by many uncertainties, including on their impacts. **It is therefore key to uphold the precautionary principle and put in place the right policy framework to regulate those technologies and their corresponding outputs, so as to avoid a scenario whereby chemical recycling becomes a loophole preventing the achievement of objectives related to the EU circular economy, climate and sustainable chemical policies**.

1 TNO Institute of Strategy, Technology and Policy, for the European Commission, Chemical Recycling of Plastic Waste (PVC and other resins), 1999. Available at: https://ec.europa.eu/environment/waste/studies/pvc/chem_recycle.pdf
2 Around 25.8 million tonnes of plastic waste are generated in Europe every year. Less than 30% of such waste is collected for recycling. A European Strategy for Plastics in a Circular Economy. Available at: https://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy-brochure.pdf
3 Less than 30% of such waste is collected for recycling. Of this amount, a significant share leaves the EU to be treated in third countries, where different environmental standards may apply. A European Strategy for Plastics in a Circular Economy. Available at: https://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy-brochure.pdf
4 Cefic's mid-century report 'Molecule Managers' sets out a plausible path towards a prosperous, more sustainable Europe in 2050. Available at: https://cefic.org/thought-leadership/mid-century-vision/
5 Technical Assessment 2020. Available at: https://www.no-burn.org/wp-content/uploads/CR-Technical-Assessment_June-2020.pdf
6 Technical Assessment 2020. Available at: https://www.no-burn.org/wp-content/uploads/CR-Technical-Assessment_June-2020.pdf
7 Waste legislation and policy of the EU Member States shall apply as a priority order the following waste management hierarchy: prevention, reuse, recycling, recovery, disposal. Available at: https://ec.europa.eu/environment/waste/framework/
8 The Waste Framework Directive, as amended by Directive (EU) 2018/851 explicitly reads: "'material recovery' means any recovery operation, other than energy recovery and the reprocessing into materials that are to be used as fuels or other means to generate energy." and "'recycling' (...) does not include energy recovery and the reprocessing into materials that are to be used as fuels (...) "
9 See, for example, https://www.process-worldwide.com/what-are-the-leading-plastic-players-doing-to-ensure-a-circular-economy-a-873519/
10 For example, the Circular Plastic Alliance and Sustainable Finance. Available at: https://ec.europa.eu/growth/industry/policy/circular-plastics-alliance_en

SPECIFICALLY, WE RECOMMEND THE FOLLOWING:

1. Review EU waste legislation to introduce definitions of chemical recycling technologies that exclude fuel production. The term 'chemical recycling' has no formal definition and is currently used in different ways.[11] We recommend updating the waste legislation (i.e Waste Framework Directive) to introduce harmonised definitions of different chemical recycling technologies (e.g. solvent-based purification, depolymerisation, and feedstock recycling) in order to provide clarity on the nature and output of different technologies covered by the term. These should exclude any operation, such as fuel production, that does not result in the production of new plastic. The European standards should then be updated accordingly.

2. Clarify the legal status of chemical recycling technologies in the waste hierarchy. We recommend only categorising as 'recycling', processes that yield outputs that are or can be directly converted into polymer materials. On the other hand, so-called 'feedstock recycling' technologies should be categorised as 'recovery' as their outputs result in simpler chemicals (e.g. hydrocarbons or syngas) that cannot be directly converted into plastics but need to be further processed in several steps to yield a polymer again.[12] The latter should exclude any fuels production.[13] This prioritisation would ensure the least environmental harm from chemical recycling technologies.

3. Limit chemical recycling feedstock to contaminated and degraded durable plastics. Subject to resolving current uncertainties,[14] chemical recycling could play a role in dealing with contaminated (e.g. containing hazardous substances) and degraded, durable plastic items. It should never be promoted as a solution for single-use products and packaging waste, or for plastic waste that's being collected for mechanical recycling. It is not sustainable to rely on a potentially very energy intensive technology to treat items destined to have a very short lifespan, and crucially, this would undermine the development of business models[15] based on waste-prevention and reuse, in line with the new Circular Economy Action Plan.[16]

4. Environmental and health impacts of chemical recycling need to be evaluated at the industrial level. Prior to incentivising any chemical recycling technology, policies must ensure the inclusion of necessary conditions for transparency on processes and performance, including and evaluation of health and environmental impacts (e.g. of hazardous substances) at the industrial level. Independent evidence should facilitate the qualitative assessment of the outputs of the chemical recycling process to guarantee their quality, including in terms of chemical content.

11 The Taxonomy Report: technical annexe refers to chemical recycling as including chemical depolymerisation (aka monomerisation), pyrolysis, gasification, solvent-based purification of polymers etc. Available at: https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/200309-sustainable-finance-teg-final-report-taxonomy-annexes_en.pdf
12 Feedstock recycling (pyrolysis and gasification) produce molecules that cannot be directly converted into polymers and need to be used as feedstock in a refining-conversion-polymerisation process.
13 Fuel production is the equivalent to energy recovery and does not contribute to creating a circular economy for plastics.
14 Technical Assessment 2020. Available at: https://www.no-burn.org/wp-content/uploads/CR-Technical-Assessment_June-2020.pdf
15 Report on Reusable Solutions by the Rethink Plastic Alliance. Available at: https://rethinkplasticalliance.eu/wp-content/uploads/2019/10/bffp_rpa_reusable_solutions_report.pdf
16 EU Circular Economy Action Plan 2020. Available at: https://ec.europa.eu/environment/circular-economy/pdf/new_circular_economy_action_plan.pdf

5. Establish a robust methodology for calculating the climate impact of chemical recycling, including all indirect and direct emissions caused by the process.[17] This includes energy use (not only in the chemical recycling process itself, but also in the cleaning/upgrading and repolymerisation processes, in the solvent / catalyser manufacturing stage, and the incineration process of recovered hazardous waste), overall electricity use, and the use of fossil wastes as a feedstock. The products of chemical recycling should also be tracked to ensure that there is no carbon leakage in the system (e.g. production of fuels instead of building blocks for new materials).

6. Develop a standard to establish the actual recycled content qualitatively and quantitatively of materials manufactured during the chemical recycling processes. This should be based on an accurate conversion rate between chemical recycling feedstock/input and the outputs of the process, as well as a batch-level mass-balance approach, also called controlled blending[18] (excluding any fuel for on-or off-site combustion) and content verification through third party audits. This type of mass-balance ensures the end-product contains at least a proportion of certified product, which allows specific end-use claims to be made. Only content fulfilling such a standard should be counted as recycled according to the EU recycling calculation rules.

7. EU funds should only support processes with a lower carbon footprint than the production of plastic from virgin feedstock. In light of the EU climate neutrality goal, all waste management activities, including chemical recycling, should be assessed to ensure they contribute to the net-zero emissions goal. Based on the full lifecycle assessment of technologies, EU funding should prioritise technologies that are less carbon-intensive than making plastics from virgin feedstock.

While chemical recycling technologies could have a role in waste management, for example in ridding some plastics of hazardous substances, they shouldn't be mistaken to be a silver-bullet solution. Potential support for chemical recycling should not come at the cost of preventative policies such as: limiting the presence of hazardous substances in materials and products, and minimising waste generation in the first place. **To maintain a focus on prevention measures, the EU must ensure that products requiring a large amount of chemicals and resources are tackled under the Circular Economy Action Plan and the Chemical Strategy for Sustainability.** Focusing too much on downstream solutions could undermine this exercise. Moreover, **there is a risk of putting too much expectation on a solution whose potential is yet to be proven**. This could delay the necessary efforts in the field of rethinking business models and material, and product redesign, including eliminating hazardous substances from plastics at the design stage.

17 Georg Seidl, L., Mamani-Soliz, P., Lee, Roh Pin., Meyer, B. (2020, February) *Chemical Recycling - Technology Overview and Current Developments.* Paper presented at NK2 Chemical Recycling Workshop, Freiberg, Germany gives a good indication of material flows and energy needed for all the chemical recycling processes, especially pyrolysis and gasification.
18 X.Chain of custody models and definitions. Available at:
https://www.isealalliance.org/sites/default/files/resource/2017-11/ISEAL_Chain_of_Custody_Models_Guidance_September_2016.pdf

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Rethink Plastic, part of the Break Free From Plastic movement, is an alliance of leading European NGOs including: Center for International Law (CIEL), Client Earth, Environmental Investigation Agency (EIA), European Environmental Bureau (EEB), European Environmental Citizen's Organisation for Standardisation (ECOS), Greenpeace EU, Seas At Risk, Surfrider Foundation Europe, and Zero Waste Europe.

Together they represent thousands of active groups, supporters and citizens in every EU Member State working towards a future free from plastic pollution.

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