Industry and researchers call for action to tackle climate impact of organic, carbon-based chemicals

September 2 2024

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Industry experts and university researchers have joined together to ask the government to address the climate impact of organic, carbon-based

chemicals.

While demand for fossil fuels as energy is expected to fall in the coming decades, the petrochemicals sector is set to grow significantly according to experts and is set out in a 2018 report by the International Energy Agency.

Members of the Supergen Bioenergy Hub, which is based at Aston University and the Biomass Biorefinery Network, believe the issue has yet to receive proper attention, and they are calling for a strategy that addresses this key component of our greenhouse gas emissions.

They want a move to a more circular economy, managing supply and demand levels and transitioning away from fossil feedstocks which are raw materials required for some industrial processes.

In their paper, "Carbon for chemicals: How can biomass contribute to the defossilisation of the chemicals sector?" they highlight that carbon-based chemicals cannot be decarbonized but can be defossilized through a transition to renewable carbon sources such as biomass, recycled carbon and carbon dioxide.

Many products in modern society contain carbon, including pharmaceuticals, plastics, textiles, food additives, cosmetics, and cleaning products. These chemicals are derived from fossil feedstocks, so they are classed as petrochemicals. As a result, they contribute to global greenhouse gas emissions and climate change. Carbon is embedded in organic chemical products and released when they break down at end-of-life, for example through incineration.

To address the emissions from carbon in chemicals and accelerate the development of bio-based chemicals, the group want a cross-party consensus to support a sustainable chemical system.

Director of Supergen Bioenergy Hub, Professor Patricia Thornley, said, "We need to consider the U.K.'s future feedstock and chemical production and use, and how it relates to net zero, agriculture, environment, economy, trade, and just transition policy objectives. There are opportunities here for the U.K. to lead the way for sustainable chemical production, but we need to carefully plan a roadmap for the transition that delivers opportunities for jobs and the economy, as well as sustainable greenhouse gas reductions.

"There is a definite role for biomass here. But it is essential that any future use of biomass in the chemicals sector is underpinned by rigorous, trusted, and enforceable sustainability governance to build confidence, deliver sustainability benefits, and minimize negative impacts. That requires improvements in sustainability governance and regulation.

"We think there are real economic and trade opportunities by the U.K. accelerating sustainable chemicals. At the moment, bio-based chemicals, and chemicals derived from other renewable carbon sources, are not being expanded in the U.K. because there are no explicit incentives that prioritize them over fossil-based production."

The group argues that the U.K. has significant academic and industrial research expertise to underpin the development of sustainable bio-based products and could be a global leader in bio-based products and sustainability governance. They believe that to date little of this has manifested as U.K.-based scale-up and manufacturing, while there are numerous examples of U.K.-led research being scaled up elsewhere.

More information: Paper: Carbon for chemicals: How can biomass contribute to the defossilisation of the chemicals sector?