Styrenics Circular Solutions

Press Release
24 June 2021

Life Cycle Analysis of food-quality polystyrene recycling options confirms significant CO_2 savings

- **LCA shows significant improvement of CO_2 footprint with high purity mechanical recycling, dissolution and depolymerisation technologies for polystyrene**
- **Further upside potential identified with scale-up production in industry setting**

Styrenics Circular Solutions (SCS), the value chain initiative to increase the circularity of styrenic polymers, today unveiled the results of a comprehensive life cycle analysis (LCA) for polystyrene. It shows excellent results for the three innovative recycling processes high purity mechanical recycling, dissolution and depolymerisation compared to the end-of-life option incineration and the production of virgin polystyrene. The LCA focused on closed loop recycling routes back to food contact quality:

- High purity mechanical recycling of polystyrene feedstock from separate collection saves approx. 80% of CO_2 emissions compared to incineration and conventional production of virgin polystyrene.
- Dissolution technology exhibits 75% CO_2 emission savings.
- Depolymerisation also saves approx. 75% of CO_2-emissions.

This LCA study of polystyrene was performed by the leading research institute Neue Materialien Bayreuth GmbH (NMB). The methodology used by NMB followed the pertinent international standards ISO 14040 / ISO 14044. The LCA results will be peer-reviewed.

Dr. Thomas Neumeyer, Head of Division Polymers, NMB, and Regino Weber, Research Associate Division Polymers, NMB, conducting the study, say: “We used a conservative approach to calculate the CO_2 emissions from polystyrene recycling yielding food-quality products. Best practices from recently published

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key LCA studies were considered, same as the know-how of industry experts globally. The full results will be peer reviewed shortly and published later-on."

Dr. Norbert Niessner, Global Head of R&D/IP at INEOS Styrolution and Chair of Technologies at SCS comments: "The ability to produce circular food grade PS recyclate with all three major recycling technologies already makes PS stand out. And now, this also comes at a significantly reduced CO_2 footprint. More upside potential is in close reach, once the innovative recycling methods are scaled-up further and the announced commercial scale plants are employed."

Jens Kathmann, Secretary-General of SCS, commented: "We now have unambiguous, clear data that polystyrene is not only excellently sortable and uniquely circular, but it also comes with a significantly reduced carbon footprint for all three recycling routes we have been focusing on. This adds to environmental benefits of r-PS processing as confirmed by our converter members. These LCA results clearly underline the important place that polystyrene has in the circular economy, not only with its closed loop food contact recyclability, but also with its contribution to climate neutrality."

On Wednesday 30 June at 10:00 am CEST, SCS will host a virtual event 'Move to Zero. Zero Waste. Zero CO_2. Powered by styrenics.' to put the positive LCA results in perspective and discuss their implications. The event will address how the favourable environmental footprint of recycled polystyrene via depolymerisation, dissolution and food contact mechanical recycling creates further market pull for circular polystyrene. The impact of the LCA for converters, brand owners, retailers and customers will be explored, along with ways in which circular polystyrene and the LCA results can contribute to achieving the EU's circular economy and climate-neutrality targets. Advance registration is required.

About Styrenics Circular Solutions

Styrenics Circular Solutions is the value chain initiative to increase the circularity of styrenics. The initiative engages the entire value chain in the development and industrialisation of new recycling technologies and solutions. It aims to strengthen the sustainability of styrenic products while improving resource efficiency within the Circular Economy.

For more information visit www.styrenics-circular-solutions.com

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