Enabling a circular economy for plastics: Life Cycle Assessment for two of Eastman's commercial-scale advanced recycling solutions – Methanolysis and Carbon Renewal Technology

The global plastic waste crisis and climate change are two of the greatest challenges of our time, and the world desperately needs a materials revolution to help address both. Eastman is advancing circular economy solutions for plastics through innovative molecular recycling technologies that transform difficult-to-recycle waste plastic into raw materials for producing new specialty plastics and fibers, with no compromise in quality or performance. The plastic waste streams include colored materials, mixed plastics, post-consumer carpets, textiles, and reject streams from other recycling systems. Eastman's molecular recycling can be done with lower greenhouse gas emissions as compared to using conventional virgin-fossil based raw materials. As molecular recycling is becoming more widely adopted, stakeholders need transparent, relevant, and high-quality LCA information for policy decisions and to form a basis for the downstream LCA of plastics and fibers. To do this, Eastman partnered with Quantis to conduct full cradle-to-gate LCAs for two of Eastman's commercial-scale molecular recycling facilities in the United States. The LCA studies compare the production of monomers and syngas from recycled feedstocks in Methanolysis and Eastman's Carbon Renewal Technology as compared against the same monomers and syngas produced from virgin fossil feedstocks. The study is based on primary industrial data and includes multiple scenarios, sensitivities, and impact categories. In this session, Jason Pierce, Senior Technical Leader from Eastman, will summarize the approach, findings, and interpretation of the LCA studies for Eastman's advanced recycling operations.