

Answers by Chris Killian, Eastman's Chief Technology Officer, to the "chat" questions asked during the February 8 GLOBE EU event on Chemical Recycling

Q: What is the "fuel use exempt" model?

If I understand the question in the context of our discussion, we referenced that plastics-to-fuel should not be attributable to materials-to-materials recycling credits. Some companies that practice gasification and pyrolysis have taken the position that the plastic-to-fuel portion of the process should also be attributable to material recycling.

Eastman's view is that waste-to-fuel should be counted as simply waste-to-fuel. Only direct material-to-material chemical recycling should be considered in the mass balance of material-to-material recycling.

Q: When referring to chemical recycling, are all technologies being considered: pyrolysis, depolymerization, glycolysis, enzymatic etc.? Wouldn't there be a difference in energy consumption ?

Absolutely, and although there are variations in the pyrolysis, gasification and depolymerization technologies generally —as I share in one of my graphics— energy consumption is greater for pyrolysis > gasification > depolymerization > mechanical recycling.

Q: Isn't chemical recycling an energy conservation process only when compared with incineration ?

The Eastman Polyester Renewal Technology (PRT) also represents conservation of energy when compared to producing the monomers and polymers from virgin fossil fuel feedstocks, which of course represents the vast majority of all polymer production.

Q: We currently produce 460 Mt of plastic annually. By 2050, we will produce more than 1,2 billion tons of plastic annually. The accumulated CO2 emissions between 2020 and 2050 will be 56 Gt set against a total carbon budget of less than 400 Gt during the same period. How do you think chemical recycling helps to address this challenge ?

Chemical recycling has the potential to significantly lower the numbers mentioned by leveraging waste plastic versus virgin fossil fuel as a feedstock.

Q: Doesn't chemical recycling act as a disincentive to "Design for Recycling"?

My view is that the opposite is true. Given that mechanical recycling requires the use of virgin fossil fuel-based PET to maintain properties and avoid downcycling for most applications, the complimentary nature of chemical and mechanical recycling in fact incentivizes a much wider range of both packaging and durable applications to design for recycling, thus favoring the choice of single materials that can readily be mechanically or chemically recycled.

Q: Will big plastic producers pay for the collection of plastic to be chemically recycled ? Consumers pay for products and their collection only to pay again for the new product

and finance recycling technologies with tax money, etc. This is not ecologically and socially sustainability.

Moving towards a circular, zero waste society calls for changes at a macro system level. This inevitably means that everyone, including local and national governments, consumers, waste management companies, waste plastic sorting, mechanical recyclers, packing and durable brands, chemical and materials industry, will have to partner to design and invest in an ecosystem that is ecologically, socially, and economically sustainable. The end results should be environmentally positive, and when economics work there will be jobs that will allow maintaining a good standard of living.

One personal concern I have is that, as a society, we let perfection get in the way of progress towards a more circular economy. Some are looking for the perfect solution to all the answers before taking the next best logical step forward.