

The plastics industry will confront its carbon footprint

In recent years, the plastics industry—shamed by the public over the amount of discarded plastic landing in oceans and waterways—has mobilized to do something about the waste problem it helped create.

But the plastics industry's environmental impact doesn't end at solid waste. The business also has a substantial greenhouse gas footprint. According to a recent report from the consulting firm Wood Mackenzie, the roughly 360 million metric tons (t) of plastic produced in 2021 generated about 1.2 billion t of carbon dioxide equivalent emissions.

If the industry changes little—what the report calls the base case—plastics production will grow by 90% by 2050. Emissions will grow 75%, to 2 billion t. “We see a slight carbon efficiency improvement in the industry in the base case,” says Guy Bailey, head of intermediates and applications at Wood Mackenzie and one of the report's authors. Such efficiencies will come from incremental improvements, such as newer equipment and novel catalysts.

However, the report envisions that

Takeaways

▶ **Plastics demand is on pace to nearly double by 2050, with a nearly proportional increase in greenhouse gas emissions.**

▶ **To improve its carbon footprint, the plastics industry and its customers will need to rethink plastic packaging and manufacturing methods.**

more aggressive interventions by plastics makers and their customers could lead to a “peak plastic” scenario, in which the market for plastics produced from fossil fuels grows 30% by 2040, then starts to contract. Under that scenario, emissions max out at about 1.5 billion t in 2035 and by 2050 sink to the levels of today.

Reaching such a goal will require a sharp reduction in plastics consumption by streamlining, or even eliminating, plastic packaging in some applications. The Wood Mackenzie report says such changes may reduce plastics demand 13% by 2050.

Companies are starting to take small steps in this direction. Walmart, for example, eliminated the plastic window on the cardboard box for a line of dolls, opting to put a picture of the toy on the box instead. The brewer Carlsberg is gluing together six packs of beer cans instead of binding them with plastic rings. Some firms

are choosing different business models altogether. PepsiCo aims to expand its SodaStream make-it-yourself beverage business in an effort to circumvent the production of 200 billion plastic bottles by 2030.

Achieving peak plastic will also require the industry to adopt biobased feedstocks, as it has with polylactic acid polymers. It will also require a sharp scale-up in chemical recycling of plastics using routes such as pyrolysis and depolymerization, Wood Mackenzie says.—ALEX TULLO

Carlsberg binds its cans together with an adhesive instead of using plastic rings.

