CHEMISTRY THAT MATTERS™

CERTIFIED CIRCULAR POLYOLEFINS

FROM SABIC's TRUCIRCLE™ PORTFOLIO OF CIRCULAR SOLUTIONS

TRUCIRCLE™ PORTFOLIO AND SERVICES

SABIC's TRUCIRCLE™ portfolio and services for circular solutions span design for recyclability, mechanically recycled products, certified circular products from feedstock recycling of used plastics, certified renewables products from bio-based feedstock and closed loop initiatives to recycle plastic back into high quality applications and help prevent valuable used plastics from becoming waste. Our TRUCIRCLE solutions are aiming to help companies around the world to drive the change needed to become a circular global society.

PRODUCTS FROM FEEDSTOCK RECYCLING OF USED PLASTICS

SABIC offers certified circular polyethylene (PE) and polypropylene (PP) materials produced from feedstock recycling of used plastics. These virgin resins from difficult to recycle post-consumer plastics produced through feedstock recycling, can have a lower carbon footprint in comparison to fossil alternatives, supporting:

- Up to 80% reduction of fossil depletion
- Up to 2 kilograms reduction of greenhouse gas (GHG) footprint when compared to energy recovery from used plastics

PYROLYSIS OIL USED AS FEEDSTOCK BY SABIC :

REPLACING FOSSIL BASED FEEDSTOCK

DERIVED FROM RECYCLED MIXED USED PLASTIC

REPROCESS MIXED PLASTIC WASTE BACK TO ITS FUNDAMENTAL BUILDING BLOCKS FOR USE IN NEW POLYMER PRODUCTION

REDUCES THE NEED FOR (NEW) FOSSIL-BASED FEEDSTOCK

CONTRIBUTES TO REUTILIZING DIFFICULT TO RECYCLE POST-CONSUMER PLASTICS

CERTIFIED CIRCULAR PRODUCTS

SABIC's TRUCIRCLE™ portfolio and services include certified circular PE and PP polymers that are produced with a feedstock of pyrolysis oil derived from recycled mixed used plastic.
We can create virgin quality polymers from pyrolysis oil produced from low quality mixed plastic using a chemical recycling technology. This process contributes to a circular economy, reduces the need for (new) fossil-based feedstock and contributes to reutilizing used plastic. SABIC's certified circular polymers have been accredited through the International Sustainability and Carbon Certification (ISCC PLUS).

NO COMPROMISE ON QUALITY

SABIC's certified circular materials are made to the same high specifications and properties as virgin products, and are an easy drop-in solution to current production processes. A broad range of PE and PP grades are available as certified circular grades.

SABIC's certified circular products are subject to a certification system[1)] that safeguards product characteristics and quantities.

CIRCULAR POLYMERS

SABIC is currently using pyrolysis oil as feedstock, produced from mixed used plastic streams that might otherwise be incinerated or used in landfills. This pyrolysis oil is first upgraded in a newly-to-be-built hydrogenation unit and is subsequently dosed into our steam crackers.

FEEDSTOCK USAGE REDUCTION

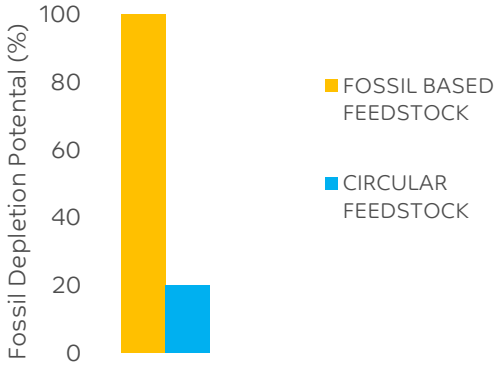
The use of pyrolysis oil as feedstock can avoid the need for fossil resources, potentially reducing the depletion of fossil resources by up to 80% and help prevent plastic from becoming waste.

CO_2 REDUCTION

Certified circular materials based on used plastics have a similar footprint as fossil based materials. Additionally, when compared to the alternative of used plastics processing via energy recovery there is a substantial avoidance of CO_2 emissions. SABIC found that throughout the production process of each ton of certified circular polymers produced from chemically recycled (polyolefin rich) mixed used plastic that is diverted from incineration with energy recovery can avoid approximately two tons of CO_2 emissions.

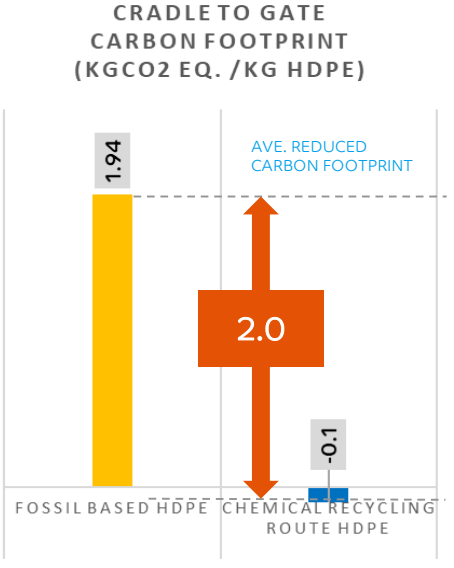
FOSSIL DEPLETION[2)]

RELATIVE IMPACTS



POLYOLEFINS GHG COMPARISON[2, 3)]

PLASTIC WASTE VERSUS FOSSIL RESOURCES



LCA CONSIDERATIONS

Based on the results of a cradle-to-gate study on SABIC's certified circular polymers, carbon footprint reduction was found to be approx. 2 kilograms of CO2 per kilogram of PE or PP resin in comparison to fossil feedstock based alternatives.

VERIFIED BY ISO CRITICAL REVIEW

The LCA was conducted by the SABIC's experts and was subsequently reviewed and approved by a panel of third party experts[3)].

APPLICABILITY

The information in this document applies to the certified circular PE and PP grades sold by SABIC. Several of SABIC's sites are certified[1)], allowing for a physically linked chain of custody in many markets.

REFERENCES

1) ISCC PLUS certification system

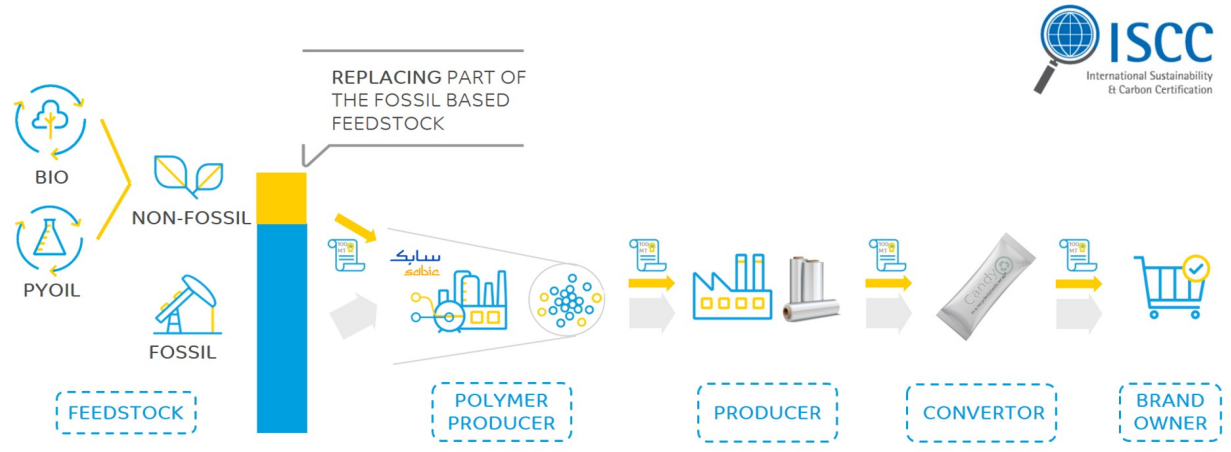
2) Cradle to Gate (kg CO2 eq / kg of polyolefin) ReCiPe Midpoint (H) V1.13 / Europe H

3) The LCA was done by the SABIC expert center according to the ISO 14040 norm, using the Circularity Footprint Formula (CFF) following the Product Environmental Footprint (PEF) guidance of the European Commission. The study passed through critical review by a panel of third-party experts according to ISO 14067.

MASS BALANCE

CHAIN OF CUSTODY

SABIC's certified circular and renewable polymers are based on a mass balance approach. To secure the chain of custody the value chain parties require an International Sustainability & Carbon Certification (ISCC PLUS) certification. This widely recognized international sustainability certification scheme verifies that the mass balance accounting follows predefined and transparent rules. In addition, it provides traceability along the supply chain, from the feedstock to the final product.



Alternative feedstock might not be physically traceable throughout the production processes when used together with non-renewable feedstock. Application of Mass Balance to attribute the alternative feedstock to an end-product in a transparent and auditable way.

VALUE OFFER OF CERTIFIED CIRCULAR PRODUCTS

Products made using SABIC's certified circular solutions, part of our TRUCIRCLE™ portfolio and services, contribute towards a new value chain, where we work in coordination with our upstream suppliers and key downstream customers to upcycle used mixed plastic back to the original polymer. This way, the material can maintain its intrinsic value so it can be used, recycled and reused again in future.

Our certified circular polymers are produced through the feedstock recycling of low quality, used mixed plastic that could otherwise be destined for incineration or landfill. Using more sustainable materials to manufacture new products and transforming previously unrecyclable plastic into a valuable material, will help protect our planet's natural resources.

PURE

- NO COMPROMISE ON PRODUCT PACKAGING QUALITY
- BIG WINDOW OF PACKAGING APPLICATIONS, INCLUDING F&B CONSUMER PACKAGING

DROP-IN SOLUTION

- IDENTICAL PRODUCT SPECIFICATIONS TO OUR CURRENT POLYOLFIN GRADE PORTFOLIO
- PROCESS NEW PACKAGING ON EXISTING EQUIPMENT WITHOUT MODIFICATIONS
- DOWN GAUGING OPPORTUNITIES (COMPARED TO MECHANICAL RECYCLING)

CAN BE RECYCLED

- NO LIMITATIONS IN NUMBER OF RECYCLING STEPS

WORLD's FIRST PREMIUM ICE CREAM BRAND

UNILEVER DEBUTS MAGNUM® TUBS CREATED FROM RECYCLED PLASTIC

Around 600,000 of the tubs are already available in Belgium, Spain and the Netherlands since 2019, with more than 7 million launched in August, 2020 covering Europe and available globally in 2021.

Magnum rolled out more than 7 million ice cream tubs made from certified circular polypropylene from SABIC's TRUCIRCLE™ initiative in 2020. The launch represented the "world's first" tub within the ice cream industry that contains recycled plastic and that aims to contribute towards the challenge of keeping plastic waste out of the environment and in the value chain.

SABIC's close collaboration with the Estée Lauder Companies (ELC), global skincare brand Origins Natural Resources Inc. and beauty packaging manufacturer Albéa has resulted in the upcoming 2021 market debut of an advanced beauty tube pack for Origins' global best-selling Clear Improvement® Active Charcoal Mask. The cap of the new packaging will be made from certified circular PP, while the tube structure is made from certified circular PE.

Avoury®, the first brand launched by Melitta Single Portions, worked with SABIC's TRUCIRCLE™ portfolio of solutions and services to create its new premium organic tea capsules, made from certified circular PP -SABIC® PP QRYSTAL copolymer. The capsules are made for the new Avoury® One tea machine, which enables the consumer to make a premium cup of tea with just the click of a button. The transparent tea capsules take the consumer experience one step further, allowing them to not only taste the high quality tea inside the capsule but also see it.

SABIC has been collaborating with Unilever and Greiner Packaging in the development of an innovative new Knorr® bouillon container using SABIC® PP FLOWPACT FPC45 certified circular impact PP from its TRUCIRCLE™ portfolio.

UK retailer Tesco has used SABIC'S TRUCIRCLE™ solutions to introduce the first recycled flexible packaging from materials returned by customers. This project demonstrated for the first time that flexible plastic can be continuously recycled into safe food-grade packaging. Cheese in packaging from this trial has been sold in selected Tesco stores.

An entire supply chain has worked together to recycle plastic collected from Tesco customers into new food-grade packaging. Plastic Energy, SABIC, Sealed Air and Bradburys Cheese worked with Tesco to conduct this trial to demonstrate that flexible plastic, that would typically go to waste, can be recycled multiple times into new plastic as a part of a closed loop recycling system.

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