

Circularity and Net Zero Perspective on Progress To Scale Up Circular Polymers Solutions Through Chemical Recycling

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Recycled content allocation rules Event hosted by ZWE On-line webinar May 12th, 2023



DOW GROWTH & NET-ZERO TRANSFORMATION

Planet Positive Chemicals System IQ Report Scenarios for sustainable global economy

Main-report-v1.20-2.pdf (systemiq.earth)

Overview of Key Scenarios



CENTER FOR

SYSTEMIQ

Planet Positive

a sustainable global economy

Chemicals Pathways for the chemical industry to enable September 202

Reshaping Plastics System IQ Report 7 Scenarios for Net-Zero Carbon



https://www.systemiq.earth/reshaping-plastics/

ReShaping the European Plastics System



Reshaping Plastics Report: Key Predictions in a Net Zero 2050 Scenario

https://www.systemiq.earth/reshaping-plastics/

12MT of virgin fossil remain in the system in 2050 in the Net Zero Systems Change Scenario – to what extent should a complete disengagement be considered?



By 2050, 78% of plastic utility is supplied by alternatives to fossil fuel in the Net Zero Systems Change Scenario

Source: "Reshaping Plastics" model



"Environmental and economic assessment of plastic waste recycling: A comparison of mechanical, physical, chemical recycling and energy recovery of plastic waste" just published. <u>https://publications.jrc.ec.europa.eu/repo</u> <u>sitory/handle/JRC132067</u>



https://www.theconsumergoodsfo rum.com/environmentalsustainability/plastic-waste/keyprojects/chemical-recycling/ Sustainable Carbon Cycles

Circularity

Climate protection

EU Policy Targets: Towards a Circular & Carbon Neutral future

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Landfill

Waste hierarchy



End of Life Targets

Recycling targets	2025	2030
Plastic packaging waste	50%	55%
Caps on municipal waste to landfill – discussion on bans		Max 10%

Plastics in Use - Recycled content/Recyclability/Reuse targets

Recycled plastics content targets	2025	2030	2035	2040
Plastics bottles (approved, 2040 proposed)	25%	30%		65%
Contact sensitive plastic packaging (proposed)		10%		50%
Rest of plastic packaging (proposed)		35%		65%
End of Life Vehicles (discussion)	20%	25%	30%	
Building & Construction		LIKEL	Y, TBC	



Alternative feedstocks targets / Sustainable Carbon Cycles (reduction of fossil feedstocks use plastics/chemical industry)

Aspirational goals	2025	2030
Alternative Sustainable non fossil Carbon Sources (bio, circular feedstocks for plastic waste and CCU)		20% (aspirational)

Recyclability for packaging proposed as legal requirement as of 2030 based on design for recycling criteria. Not compliance means market withdraw.



Mandatory min recycled plastics content targets for packaging and auto coming as of 2030.



Mandatory reporting of eco-design criteria for all products placed in EU marketplace as of 2030, including LCA in Digital Product Password.

Mandatory ESG reporting for all EU companies including circular economy metrics (recycled content use) as of 2025.

Plastics Users Have Bolder Recycled Plastics Goals vs Policy Clear Market Pull

Voluntary bold Packaging BO's commitments to decrease virgin fossil plastic, increase recycled content use (25% by 2025 avrg), 100% recyclable/reusable/compostable by 2025 and increase reuse models. Full report <u>here</u>

FIGURE 6

12 global leading FMCG's/flexile pack converters, mostly playing in food, beverages and personal care, made a public statement position end 2022 **signaling a demand only in Europe for food contact recycled plastics of 800,000 MT by 2030** from AR in addition to MR recyclates to meet growing market demand for recycled plastics in plastic **packaging** applications. Full press release and letter can be found <u>here</u>.

Automotive OEM's are pledging for use 20-25% of recycled plastics by 2030



COLGATE-PALMOLIVE

MARS

londelez.

NACKING MADE RIGHT

DEDG

Unilever

Camcor Barilla

HALEON

Top 10 FMCG companies by revenue: key progress metrics on plastic packaging, 2018-2021 ENSURE 100% OF PLASTIC DECREASE VIRGIN INCREASE THE SHARE TOTAL MOVE FROM SINGLE-2021 🛛 2025 targe ACKAGING IS REUSABLE USE TOWARDS WEIGHT PLASTIC USE RECYCLABLE, OR REUSE MODELS RECYCLED (PCR) CONTENT Weight of virgin plast COMPOSTABLE (RRC) - =0 920k +4.4 Nestle 1% 1% Procter & Gamble 2.500k PepsiCo +3.3 -0.9 Not reported +5% 2,235 C 70/ AB InBev 100% 713 Unileve +3 0.1% JBS Not a Global Commitment Signator Tyson Foods Not a Global Commitment Signator The Coca-Cola Company 3.224 -27 9% 13.6% +3% +4.6 1.3% 4% 204 =0 Mars, Incorporated -3 0% 0% L'Oréa +0.6 +8.8 0.4% 1% d according to their revenues as of the beginning of the Global Con 2018 data reported in this table might differ from previous reports as companies might have updated pre Year-on-year growth is calculated in percentage for virgin weight and using percentage points for all other metri orted in most cases for the relevant company's financial year ending 2021. Details of the re ited to primary and secondary plastic packaging in 27 markets repre

Polyolefins Market in Europe Today Huge Opportunity for Circularity, key Net Zero Enabler



Source:

Conversio Report for PCEP PO waste collection and recycling in EU28+2 countries 2019 AMI | Market Reports | Mechanical Plastics Recycling European Market 2022 Eunomia | Flexible films market in Europe: State of play – Production, collection and recycling data 2020



Flexible Plastic Packaging Market Reaching Recycled Content Targets



eunomia

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Source:

Conversio Report for PCEP PO waste collection and recycling in EU28+2 countries 2019 AMI | Market Reports | Mechanical Plastics Recycling European Market 2022 Eunomia | Flexible films market in Europe: State of play – Production, collection and recycling data 2020

Dow's Sustainability Goals - 2030 and beyond Circularity and Climate Protection hand in hand...



By 2030, Dow will PROTECT THE CLIMATE by reducing its net annual carbon emissions by 5 million metric tons compared to its 2020 baseline (15% reduction). By 2050, Dow intends to be carbon neutral (scopes 1 + 2 + 3 plus product benefits).

TRANSFORM THE WASTE

By 2030, plastic waste and other forms of alternative feedstock to commercialize 3 million metric tons of circular and renewable solutions annually.

*Dow expects the waste required to produce this target to surpass and replace its original 1 million metric ton Stop the Waste goal.





CLOSE THE LOOP

By 2035, Dow will CLOSE THE LOOP by enabling 100% of Dow products sold into packaging applications to be reusable or recyclable.



Our 5 Pillars Sustainability Strategy ...through Innovation and Partnerships

Plastic sustainability



Design for Reducing / Reusing

How recycled carbon can work in highly integrated industrial processes? Using existing high capacity/capex processes brings efficiency, rapid scale up and affordability, mass balance can enable it

- In chemical industry's highly integrated processes, carbon can be recycled and not emitted to the atmosphere.
- Carbon would be recycled into hundreds of different products across integrated production;
- An agreed chain of custody model is needed specifying how much recycled carbon can be allocated to plastics and other products.
- Chain of custody & mass balance methods (e.g., fuel exempt allocation) offer framework to deliver desired recycled content targets and increase effectively recycled carbon use.



https://www.petrochemistry.eu/about-petrochemistry/flowchart/

Why mass balance chain of custody is critical for PO chemical recycling Fuel-use exempt as the most efficient allocation model



Dow's key requests in Polymers and Chemicals Value Chain Effective policy framework to enable a circular and net zero transition

- Recognition of the contribution of all recycling technologies (including novel chemical recycling and others) to circular targets, as they enable recovery of wasted products back again to be used as raw materials in the new circular economy and reduce fossil resources use and associated carbon emissions and helping solve the waste problem.
- Improved waste collection and sorting provisions, reduce incineration and ban landfill to effectively enable transition towards a new circular economy.
- Setting clear targets to promote the use of sustainable-sourced renewable biobased carbon sources, recycled materials and renewable carbon from carbon capture and incentivize their use vs convectional fossil resources.
- Legal recognition of mass balance accounting, where all outputs except fuel can be counted (fuel-use exempt) to enable all recycling technologies to play a fair level play field role in the circular transition.
- Build on existing certification schemes to ensure credible and harmonized claims
 on sustainability and traceability



Thank You Questions?

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