

UNEP Mekong River Project

SESSION 5: Science-based
actions to tackle
plastic wastes

*Part 1: Value chain and
upstream solutions*

Creating inclusive circular plastics value chains-
global coordination and local solutions.

Patrick Schröder

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Circular Economy team

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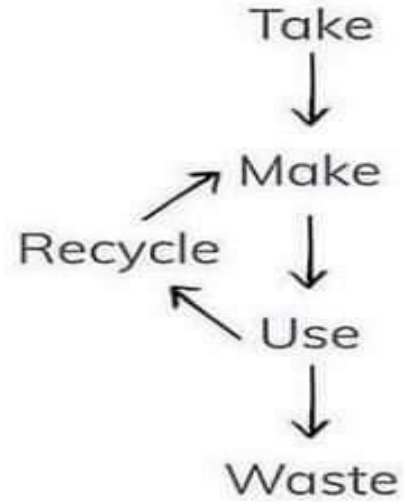
- Leading expertise on the circular economy
- Expertise: Finance, Trade, Just Transition & SDGs, Policy and Legislation, Geopolitics and Global Developments.
- High-impact research and convening activities
- Regularly advising Governments, multilateral institutions, MNCs
- On-the-ground project work in LMICs (SWITCH to CE & SMEP)
- Strong support from Chatham House global pool of experts and convening power.

From linear to circular

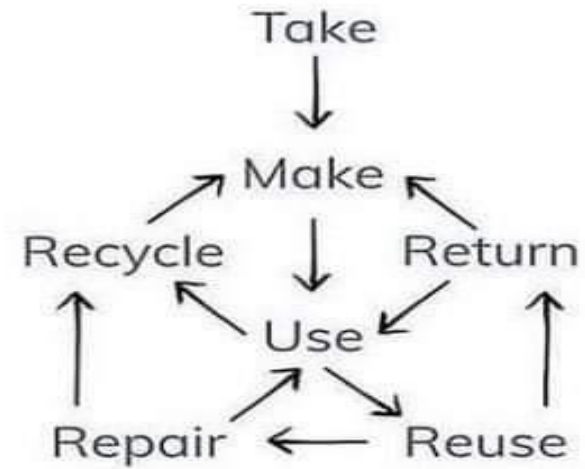
LINEAR ECONOMY



RECYCLING ECONOMY



CIRCULAR ECONOMY





Towards a global plastics treaty
by 2024

Ending plastics pollution
by 2040

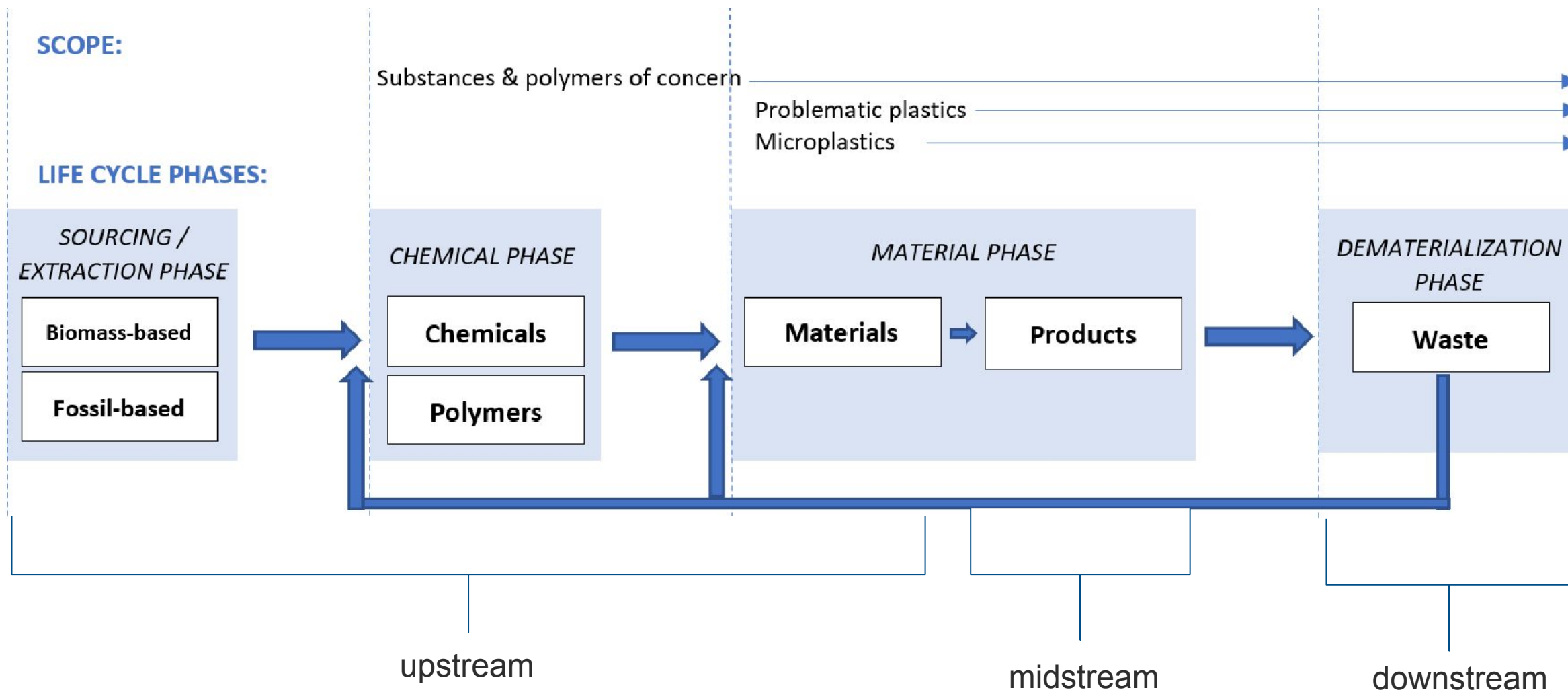
“The instrument is to be based on a comprehensive approach that addresses **the full life cycle of plastic**. The INC will consider how to promote sustainable production and consumption of plastics from product design to environmentally sound waste management through resource efficiency and circular economy approaches.”

The plastic packaging value chain

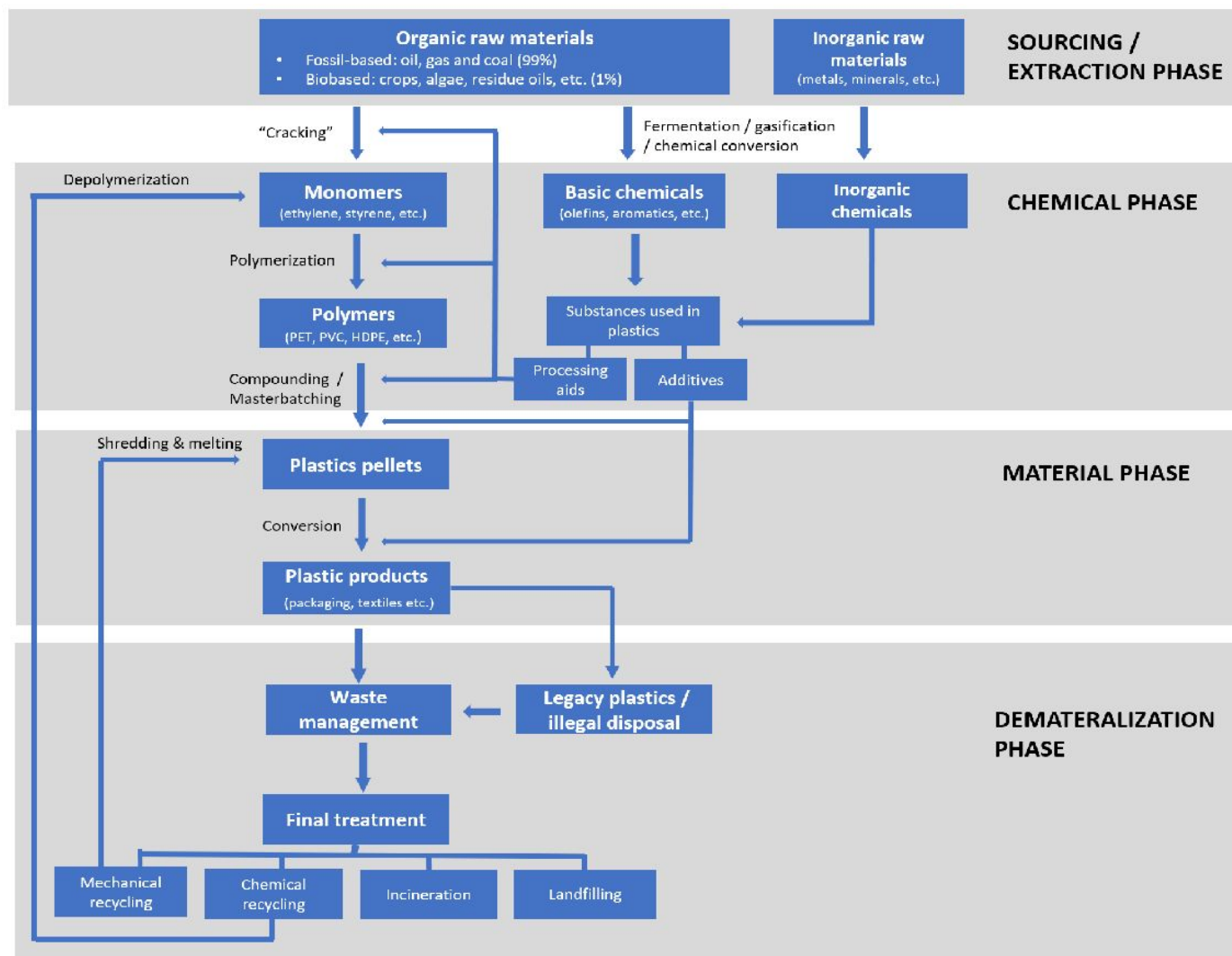
The current linear model for producing plastic packaging in a simplified diagram. In reality, the structure of the supply chain varies greatly by packaging type and application.



Upstream-midstream-downstream



Plastic life cycle and phases



Seven detailed life cycle phases of extraction, production, manufacture, consumption, waste management, final disposal, and remediation. These seven life cycle phases are further clustered into four primary phases.

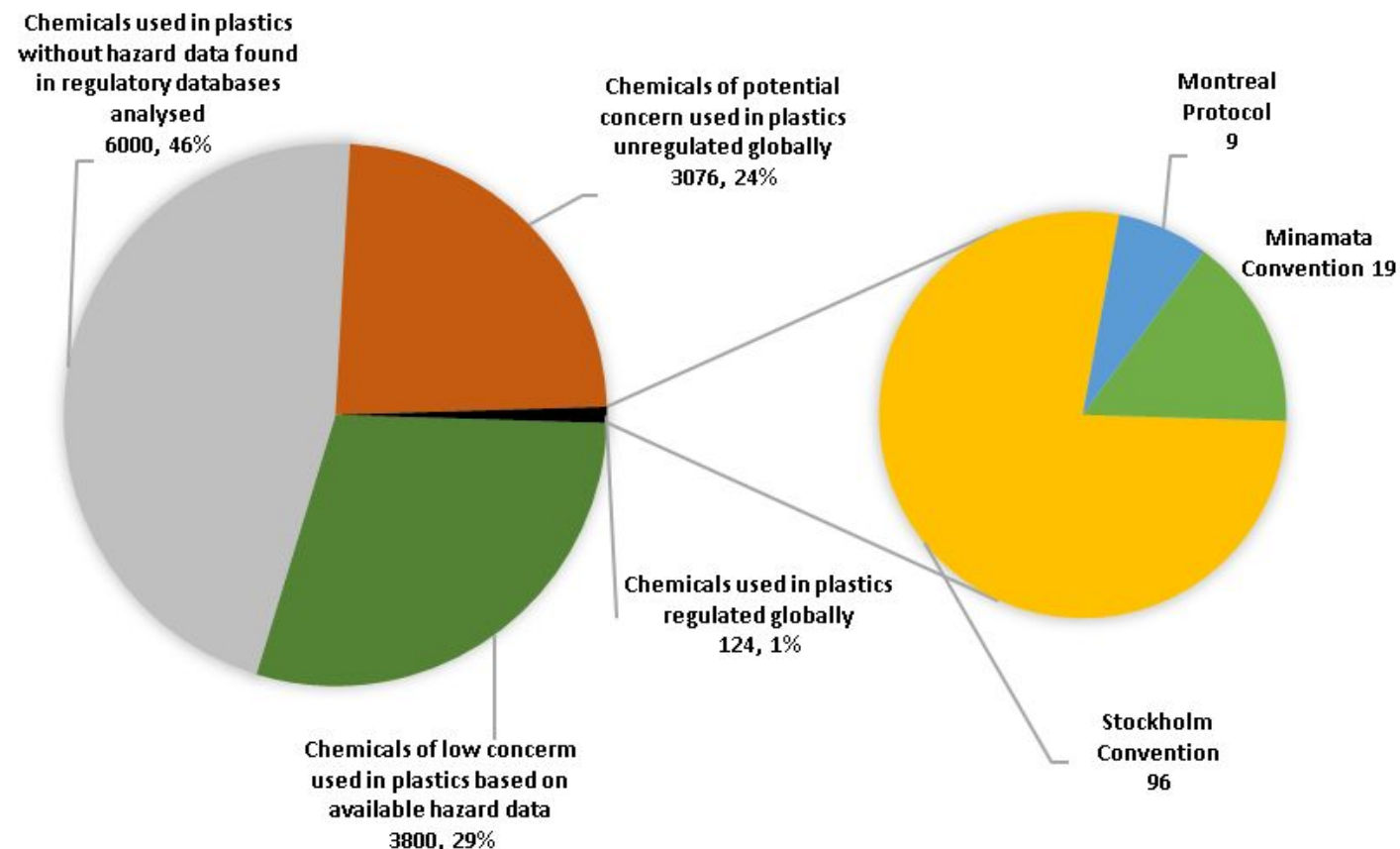
Upstream stakeholders

Life cycle phase	Value chain phase	Actors
Sourcing/ extraction phase	1. Extraction of raw materials A) Organic raw materials (hydrocarbons): <ul style="list-style-type: none"> Fossil raw materials from oil drilling, fracking and mining: crude oil, natural gas and coal Bio-based raw material: land-based crops, aquatic algae or seaweed, waste and residue oils, etc. 	Oil & gas industry (fossil fuels are extracted from wellheads or drill pads and then transported by pipeline or rail to refineries and processing plants) Bio-based raw materials producers
	B) Inorganic raw materials <ul style="list-style-type: none"> Many chemicals used in plastics are prepared from inorganic compounds, including fillers (mica, talc, calcium carbonate, etc.), reinforcements (glass fibers, etc.), and pigments. 	Mining and smelting industry (inorganic materials)
Chemical phase	2. Production Step 1: Building block production <ul style="list-style-type: none"> Refining crude oil, natural gas and coal (or bio-based raw materials) through a “cracking”/ “gasification” process and subsequent reactions to produce initial building blocks (e.g., ethylene, styrene, vinyl chloride, etc.) 	Refiners: <ul style="list-style-type: none"> Petrochemical refineries Biorefineries
	Step 2: Chemical processing A) Polymer production <ul style="list-style-type: none"> Includes <200,000 polymers B) Production of commodity and speciality chemicals <ul style="list-style-type: none"> Includes up to 13,000 additives, monomers, processing aids used for plastics, as well as NIAS 	Polymer and chemical producers: <ul style="list-style-type: none"> Chemical manufacturers (including polymer manufacturers)
Material phase	3. Manufacturing Step 1: Manufacturing of materials (e.g., compounding) <ul style="list-style-type: none"> Consists of preparing plastic formulations by mixing and/or blending polymers and additives to achieve the desired characteristics 	Compounders / masterbatchers: <ul style="list-style-type: none"> Companies specialized in this field Polymer producers and manufacturers also undertake this work
	Step 2: Manufacturing of intermediates and final products <ul style="list-style-type: none"> Intermediate moulding, spinning, drawing and cutting Manufacturing and remanufacturing of final products 	Product producers / brand owners:

Chemicals in plastics production

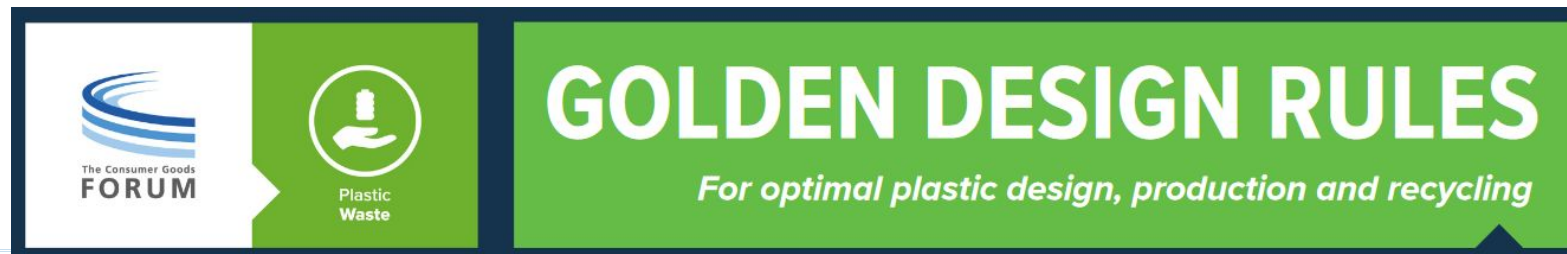
Up to 13,000 chemicals have been used in plastics as monomers, additives, processing aids and non-intentionally added substances (NIAS), from which 3,200 are identified as chemicals of potential concern based on existing hazard types.

For 6,000 chemicals used in plastics, no hazard data was found in regulatory databases analyzed, thus many of them could also be chemicals of potential concern.



Midstream opportunities – design rules for plastics

1. Increase Value in PET Recycling (e.g. use transparent and uncoloured PET)
2. Remove Problematic Elements from Packaging (e.g. no PVC, EPS, oxo-degradeables)
3. Eliminate Excess Headspace (e.g. set maximum target)
4. Reduce Plastic Overwraps
5. Increase Recycling Value for PET Thermoformed Packaging
6. Increase Recycling Value in Flexible Consumer Packaging
7. Increase Recycling Value in Rigid HDPE and PP (e.g. use minimal printing)
8. Reduce Virgin Plastic Use in Business-to-Business Plastic Packaging
9. Use On-Pack Recycling Instructions



EU legislation on Packaging and Packaging Waste

New proposal published 30 Nov 2022

All packaging to be fully recyclable: Designed for Recycling by 2030 and 'Recycled at Scale' by 2035.

By 2029 countries must create deposit return schemes for metal and single-use plastic beverage containers.

Harmonised eco-modulated EPR fees in every Member State based on packaging recyclability credentials and recycled content.

Minimum recycled content targets for plastic packaging for 2030 and 2040.

Etc.

All plastic packaging for the EU market must be recyclable by 2030



Only the most recyclable plastic packaging formats can be sure to pass through the funnel of EU's recyclability requirements, as these restrictions tighten over time.

Single-material items with minimal colouring and contamination will be favoured. Widely recyclable polymers such as PE, PP and PET may grow in use.

[Structure](#)[Work programme](#)[Published Standards](#)[EUROPEAN STANDARDIZATION](#)[GET INVOLVED](#)[AREAS OF WORK](#)[NEWS AND EVENTS](#)[EN](#) | [FR](#) | [DE](#)

CEN/TC 249 Subcommittees and Working Groups

Working group	Title
CEN/TC 249/WG 11	Plastics recycling
CEN/TC 249/WG 13	Wood Plastics Composites (WPC)
CEN/TC 249/WG 16	Welding of thermoplastics
CEN/TC 249/WG 21	Profiles for windows and doors
CEN/TC 249/WG 24	Environmental aspects
CEN/TC 249/WG 25	Static thermoplastic tanks for above ground storage of fuel
CEN/TC 249/WG 26	Agricultural plastic products - Design-for-recycling, use, removal, collection and recycling
CEN/TC 249/WG 4	Decorative laminated sheets based on thermosetting resins
CEN/TC 249/WG 5	Thermoplastic profiles for building applications
CEN/TC 249/WG 7	Thermoplastic films for use in agriculture
CEN/TC 249/WG 9	Bio-based and biodegradable plastics

Plastic recycling standards – currently 24 under drafting and/or approval stages



CEN/TC 249/WG 11 Work programme

Project reference	Status	Initial Date	Current Stage	Next Stage	Forecasted voting date
prEN 15342 rev (WI=00249A5X) Plastics - Recycled Plastics - Characterization of polystyrene (PS) recyclates	Under Drafting	2023-02-03	2023-02-03	2023-06-02	2024-11-15
prEN 15344 rev (WI=00249A5Z) Plastics - Recycled plastics - Characterization of Polyethylene (PE) recyclates	Under Drafting	2023-02-03	2023-02-03	2023-06-02	2024-11-15
prEN 15345 rev (WI=00249A60) Plastics - Recycled Plastics - Characterisation of Polypropylene (PP) recyclates	Under Drafting	2023-02-03	2023-02-03	2023-06-02	2024-11-15
prEN 15346 (WI=00249A45) Plastics - Recycled plastics - Characterization of poly(vinyl chloride) (PVC) recyclates	Under Approval	2021-06-29	2022-08-25	2024-01-11	2024-01-11
prEN 15347 (WI=00249A44) Plastics - Recycled plastics - Characterisation of sorted plastics wastes	Under Approval	2021-06-08	2022-06-09	2023-12-21	2023-12-21
prEN 15348 (WI=00249A42) Plastics - Recycled plastics - Characterization of poly(ethylene terephthalate) (PET) recyclates	Under Approval	2021-03-12	2022-06-09	2023-09-23	2023-09-23

SWITCH to Circular Economy at a glance

Aim

A just transition to an inclusive, climate neutral and circular economy



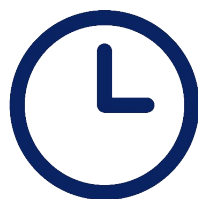
Funded by

European Union and Finland



Value chains

Textile & Garments
Plastic packaging
ICT & Electronics



Duration

2021-2025



Total budget

€20,870,000;
approx. €5M for BD



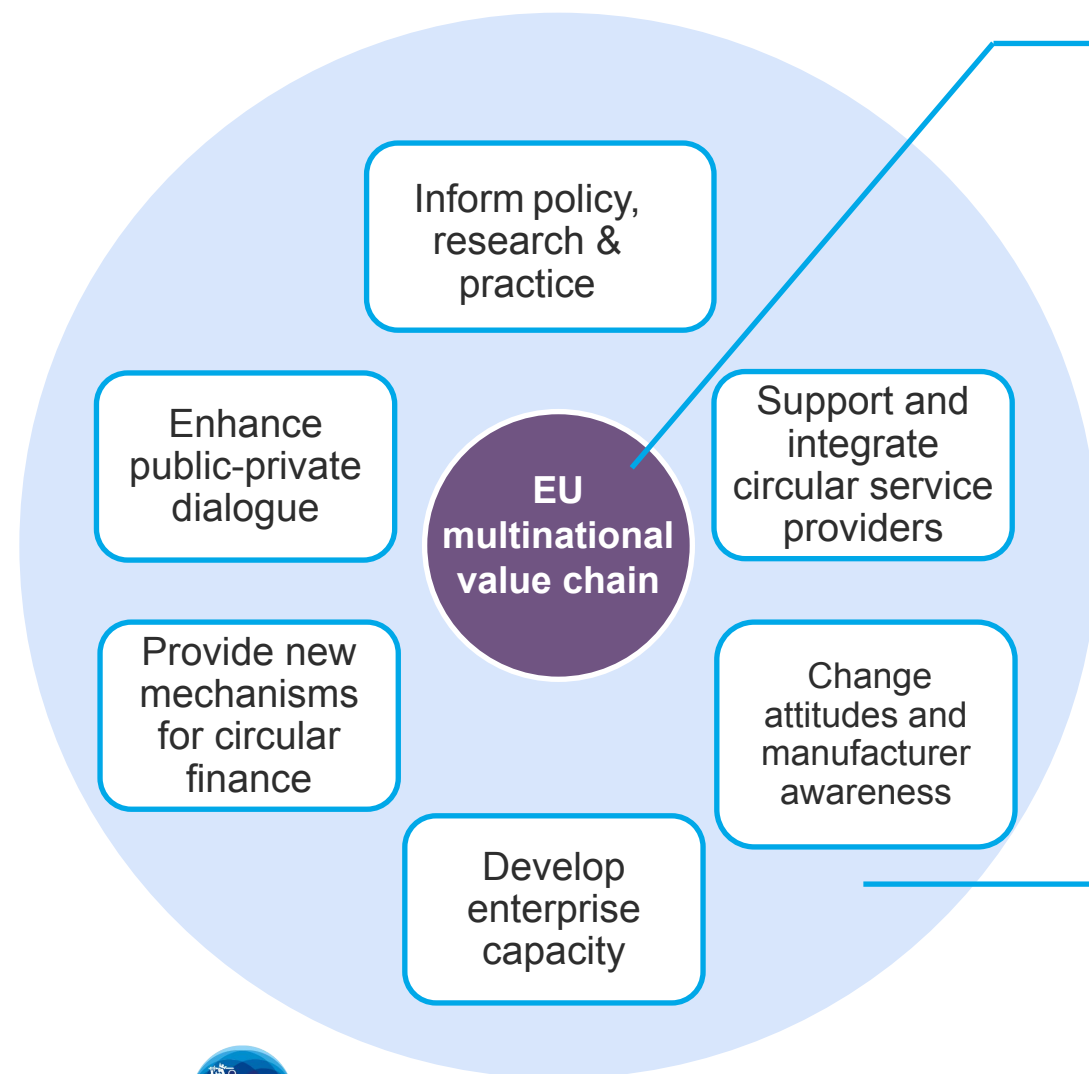
Implementing organization
United Nations Industrial Development Organization (UNIDO)



In collaboration with

Chatham House
Circle Economy
European Investment Bank

Pilot projects are the pivot point



Pilot project

(designed and led by applicants, bearing in mind SWITCH aims)

Designed and implemented in parallel

SWITCH2CE Programme

(actions focused on improving enabling environment, designed and led by SWITCH partners*, bearing in mind pilot aims)

SWITCH2CE Publication: The EU's Circular Economy transition for plastics and textiles

- **Summarises EU circular economy policies** for plastics and textiles sectors.
- **Analyses the impacts of CE policies** on trading partners and emerging markets.
- **Recommendations for policy and industry** to use the circular economy transition for their competitive advantage.

Available also in French and Bengali:

www.switchtocircular.eu/publications



Building Transformative alliances

Research Paper
Patrick Schröder
Energy, Environment and Resources Programme | April 2020

Promoting a Just Transition to an Inclusive Circular Economy



Just Transition

Research Paper
Environment and Society Programme
July 2021

Financing an inclusive circular economy

De-risking investments for circular business models and the SDGs

Patrick Schröder and Jan Raas



Finance

Framework Document
Recommendations from a global expert working group
June 2022

Trade for an inclusive circular economy

A framework for collective action

Jack Barrie, Latifahaida Abdul Latif, Manuel Albaladejo, Ieva Barbauskaitė, Alexey Kravchenko, Amelia Kuch, Nanno Mulder, Melissa Murana, Antoine Oger and Patrick Schröder



Trade Facilitation

Research Paper
Environment and Society Programme
September 2022

The role of international trade in realizing an inclusive circular economy

Jack Barrie, Patrick Schröder and Marianne Schneider-Petsinger, with Richard King and Tim G. Benton



Trade and SDGs

Thank you for your attention!

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