



PlasticsEurope Eco-profiles: program status and perspectives

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- What are they used for ?
- How are they made ?
- Where can they be found ?
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What are Eco-profiles ?

Building blocks for LCA of products containing plastic



Comparing Kg of polymers is meaningless !



It is Life Cycle Inventory of **1 kg of polymer** from **Oil and gas to Polymer** production at Gate (unpacked)



Different plastics for different needs

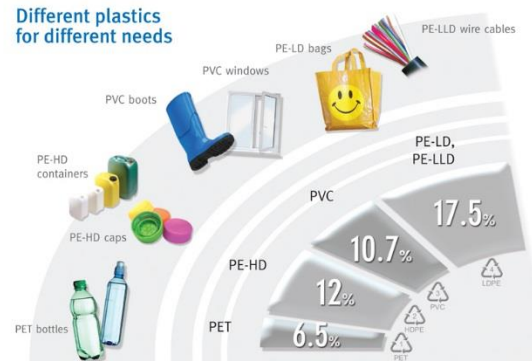


Figure 6: European plastics demand* by resin type 2012
Source: PlasticsEurope (PEMARG) / Consultac / ECEBD
* EU-27+UK/CH

Comparing solutions is meaningful



Plastic vs. plastic
There are various types of plastics featuring different properties. The international recycling codes (ranging from 1 to 7) which are featured on most plastic products are meant to make (unmixed) separation easy.

What are eco-profiles used for ?

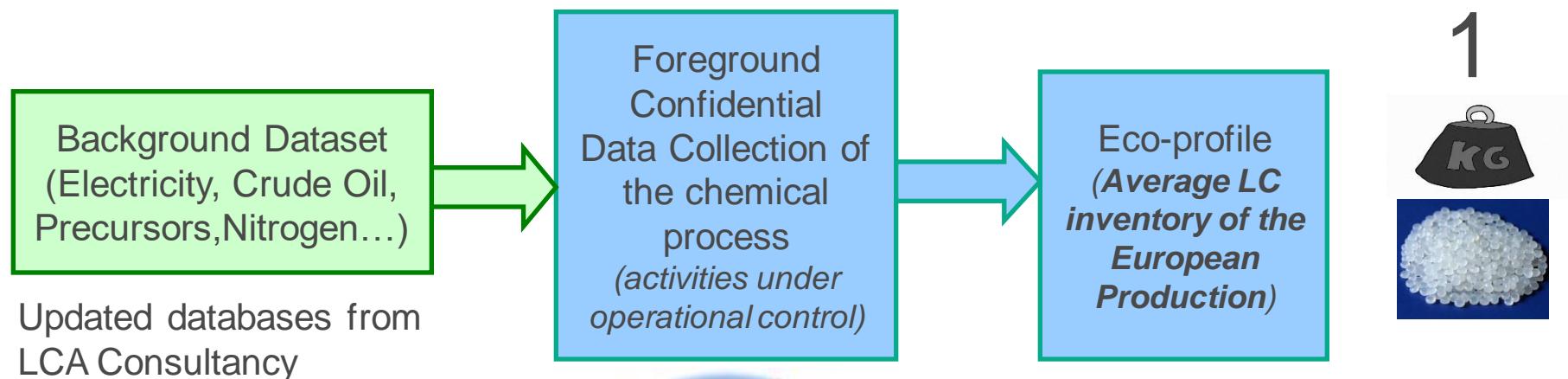
Feedback from Plasticseurope members and LCA practitioners



- Bench Marking, Information to supply chain (LCA, Carbon Footprint), LCA studies, EPD, feed LCA database..
- Strengths: Industry representativeness, documentation, freely available, credibility
- Potential for improvements: cooperation with other databases and disaggregation when possible

How are eco-profiles made ?

Working with companies and consultancy

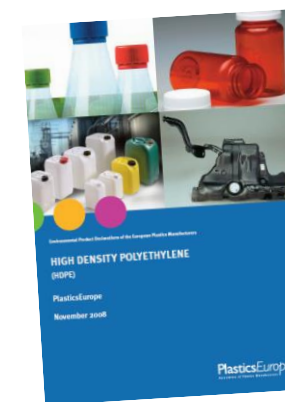


Input amounts

- Electricity
- Steam
- Raw Materials...

Output amounts to the environment

- VCO to the air
- COD to water
- Specific emissions...

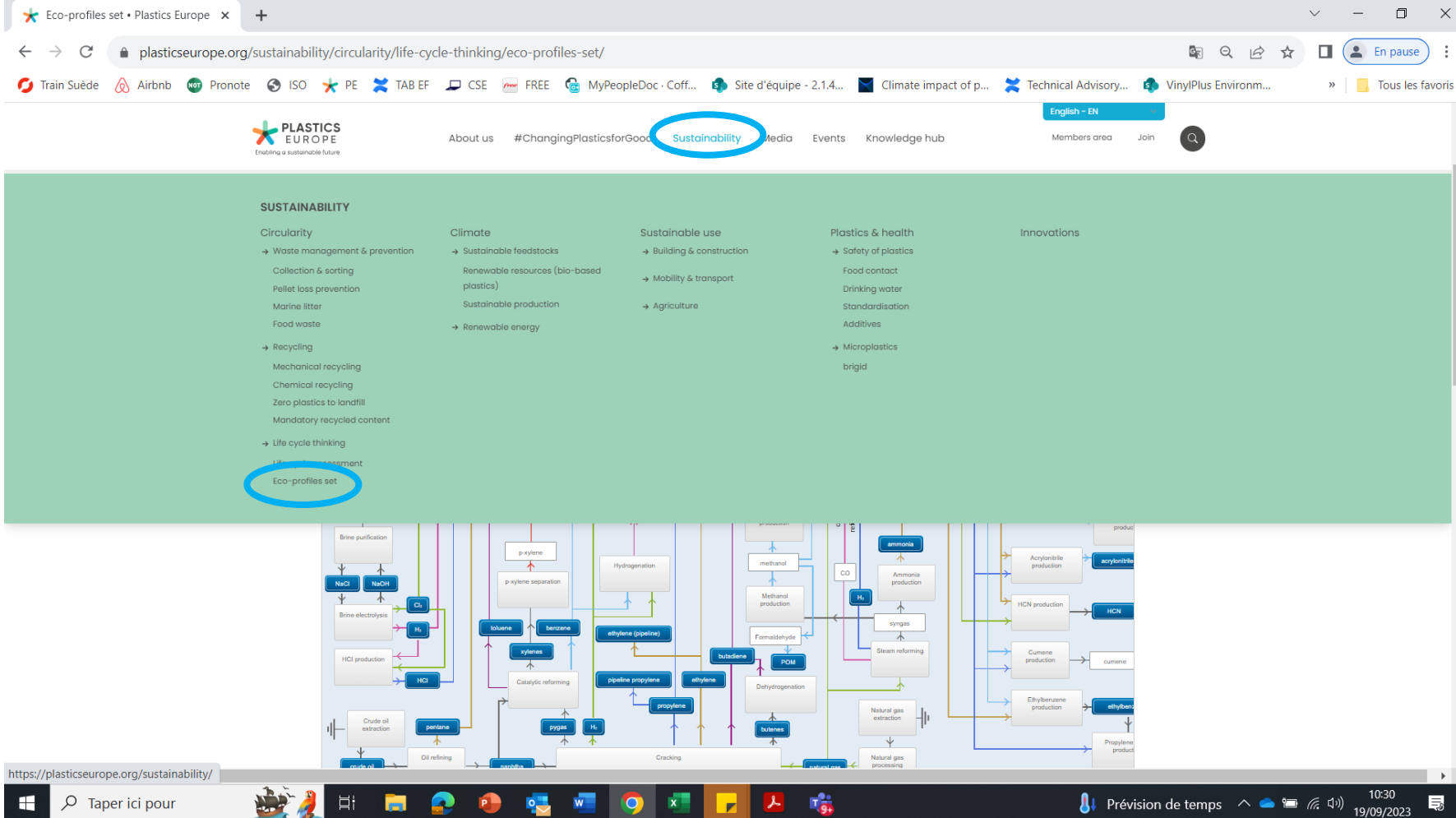


PlasticsEurope website,
Gabi, Simapro, Eco-invent databases...

Where can co-profiles be found ?

PlasticsEurope Website and databases

<https://plasticseurope.org/sustainability/circularity/life-cycle-thinking/eco-profiles-set/>



The screenshot shows a web browser window displaying the PlasticsEurope website. The URL in the address bar is <https://plasticseurope.org/sustainability/circularity/life-cycle-thinking/eco-profiles-set/>. The website header includes the PlasticsEurope logo and navigation links: About us, #ChangingPlasticsforGood, Sustainability (circled in blue), Media, Events, Knowledge hub, Members area, and Join. A search bar is also present.

The main content area is titled "SUSTAINABILITY" and features a grid of sub-topics:

- Circularity**
 - Waste management & prevention
 - Collection & sorting
 - Pellet loss prevention
 - Marine litter
 - Food waste
 - Recycling
 - Mechanical recycling
 - Chemical recycling
 - Zero plastics to landfill
 - Mandatory recycled content
 - Life cycle thinking
 - Life cycle assessment
 - Eco-profiles set (circled in blue)
- Climate**
 - Sustainable feedstocks
 - Renewable resources (bio-based plastics)
 - Sustainable production
 - Renewable energy
- Sustainable use**
 - Building & construction
 - Mobility & transport
 - Agriculture
- Plastics & health**
 - Safety of plastics
 - Food contact
 - Drinking water
 - Standardisation
 - Additives
 - Microplastics
 - brigid
- Innovations**

Below the menu is a detailed chemical process flow diagram. It illustrates the production of various plastics from raw materials. Key processes include:

- Cracking:** Crude oil extraction and oil refining lead to naphtha, which is cracked into ethane, propane, and butane.
- Hydrogenation:** Ethane is hydrogenated to ethane (pipeline), which is then cracked into ethylene and propylene.
- Steam reforming:** Natural gas extraction and processing lead to syngas, which is used for ammonia production and methanol production.
- Ammonia production:** Ammonia is used for urea and other products.
- Methanol production:** Methanol is used for formaldehyde and other products.
- Acrylonitrile production:** Acrylonitrile is produced from methanol and ammonia.
- HCN production:** Hydrogen cyanide (HCN) is produced from ammonia and methane.
- Cumene production:** Cumene is produced from ethylene and benzene.
- Ethylbenzene production:** Ethylbenzene is produced from ethylene and benzene.
- Propylene production:** Propylene is produced from ethane and propane.

The diagram shows the flow of materials and energy between these processes, highlighting the interconnected nature of the chemical industry.

Where can co-profiles be found ?

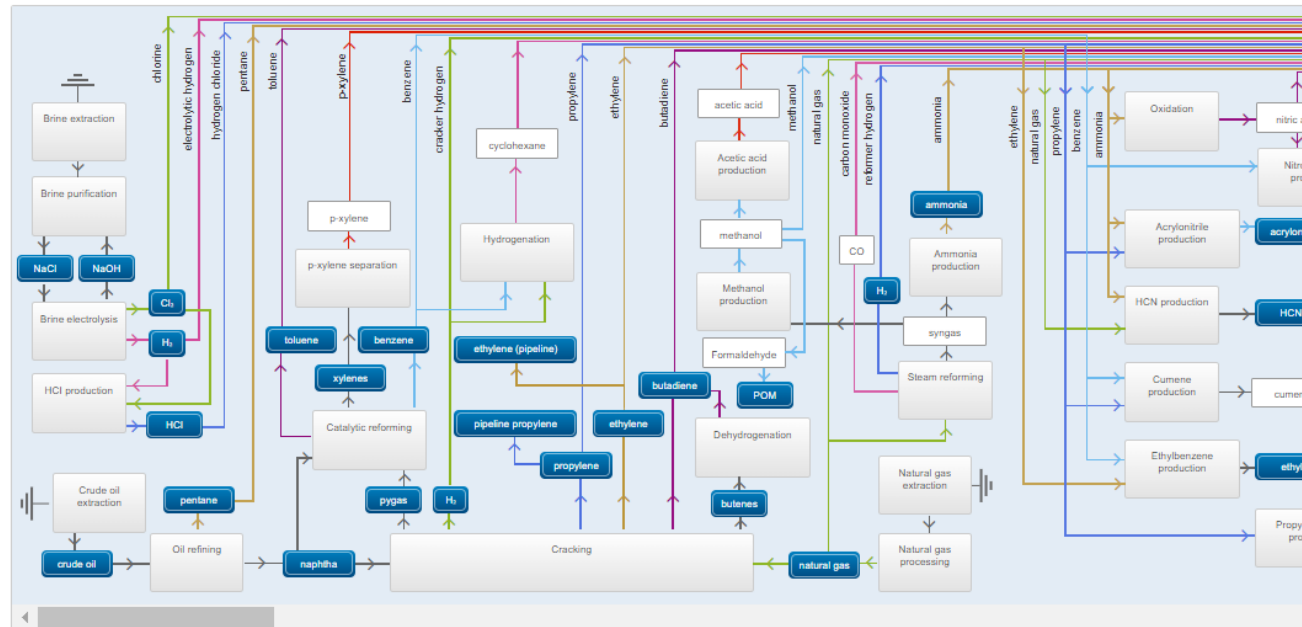
PlasticsEurope Website and databases

<https://plasticseurope.org/sustainability/circularity/life-cycle-thinking/eco-profiles-set/>

Eco-profiles for determining environmental impacts of plastics

Our Eco-profiles comprise Life Cycle Inventory datasets (LCI) and Environmental Product Declarations (EPD) for plastics.

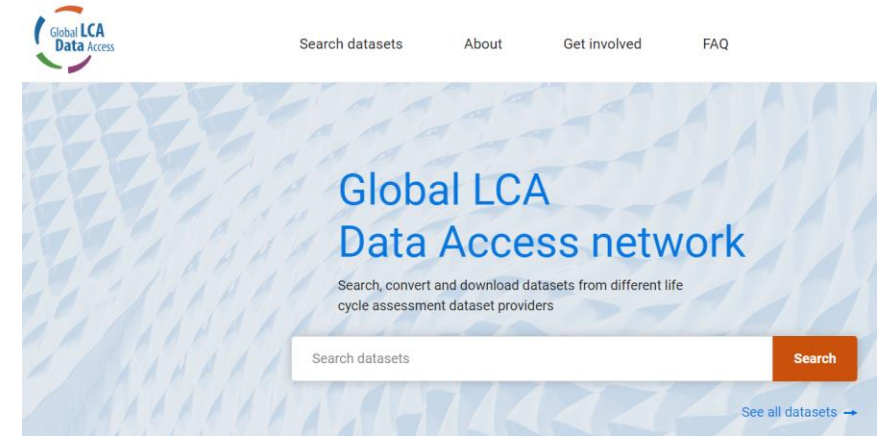
Click on a blue box in the flowchart, then click on the small arrow at the right bottom corner of the highlighted box to download an Eco-profile package that contains a report and dataset in several formats. The information icon at the top right of the highlighted box will give you the calculation and process dates. Some datasets considered to be obsolete have been withdrawn but can be supplied on demand. Please contact us if you'd like to access one of these.



Where can eco-profiles be found ?

PlasticsEurope Website and databases

- GLAD Library <https://www.globalcadataaccess.org/>



ADAPTED to different database

- EC EF Compliant database
- Ecoinvent: for PEs, PP, PVC, PET the disggregated version adapted to their database
- Gabi

Eco-profiles current update status

Year of publication	Ecoprofile
2019	PC
End 2021 but <u>Not published due to O&G data discussion</u>	O&G to PE and PP
2022	Styrene
2022	PS
2022	EPS
2022	PVC
2022	PA6
end 2023	PA66
end 2023	ABS/SAN
	Total

Eco-profiles Program



Ecoprofile	Update
PE and PP when O&G data validated	2024
PVC when O&G data validated	2024
PC	2024/2025
PS	2026/2027
EPS	2026/2027
PA6	2026/2027
PA66	2027/2028
ABS/SAN	2028

Eco-profile Evolution

- Adapt to EC Environmental Footprint dataset format (currently EF3.1)
- Oil and Gas datasets selection
 - Monitor data selected by Eco-invent, Sphera, EC EF database
 - Update polyolefins, PVC in priority, progressively other polymers
- Steam Cracker allocation
 - Published in 2018
 - Need for revision

Eco-profile Evolution

To be included in methodology

- Green Electricity certificate
- Credit Mass Balance
- Biogenic Carbon
- CCS, CCU

Chemically recycled feedstock: think of additional consequential information including avoided emissions

Thanks !