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Atlantis report

Example of a report on the Plasteax dataset:
The case of consumer packaging

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PLASTEAX WASTE MANAGEMENT DATA

Plasteax database provides a comprehensive snapshot of the plastic situation, offering specific information on **various indicators** such as :

- Managed Waste (including incineration and sanitary landfill)
- Recycling
- Mismanaged Waste (including uncollected, dumped and littered)
- Leakage (direct) into ocean and waterways

Plasteax data offers highly specific data that can be tailored to individual countries, polymer types, applications, or any combination of these factors for different **scopes**:

- Sectors (Packaging, Textile)
- Polymer
- Category

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A SERVICE PROVIDED BY EA – EARTH ACTION

EA - Earth Action is a mission-driven research consultancy. In addition to supporting organizations through a broad service offering, EA regularly works to identify and address critical sustainability knowledge gaps, developing the data and applying insights to create research trusted by scientists and actionable by all.

EA is particularly recognized for expertise and leadership in the field of plastic pollution, contributing novel research, perspectives, frameworks, and methodologies to help global organizations address the issue within their own realm and beyond.

Learn more
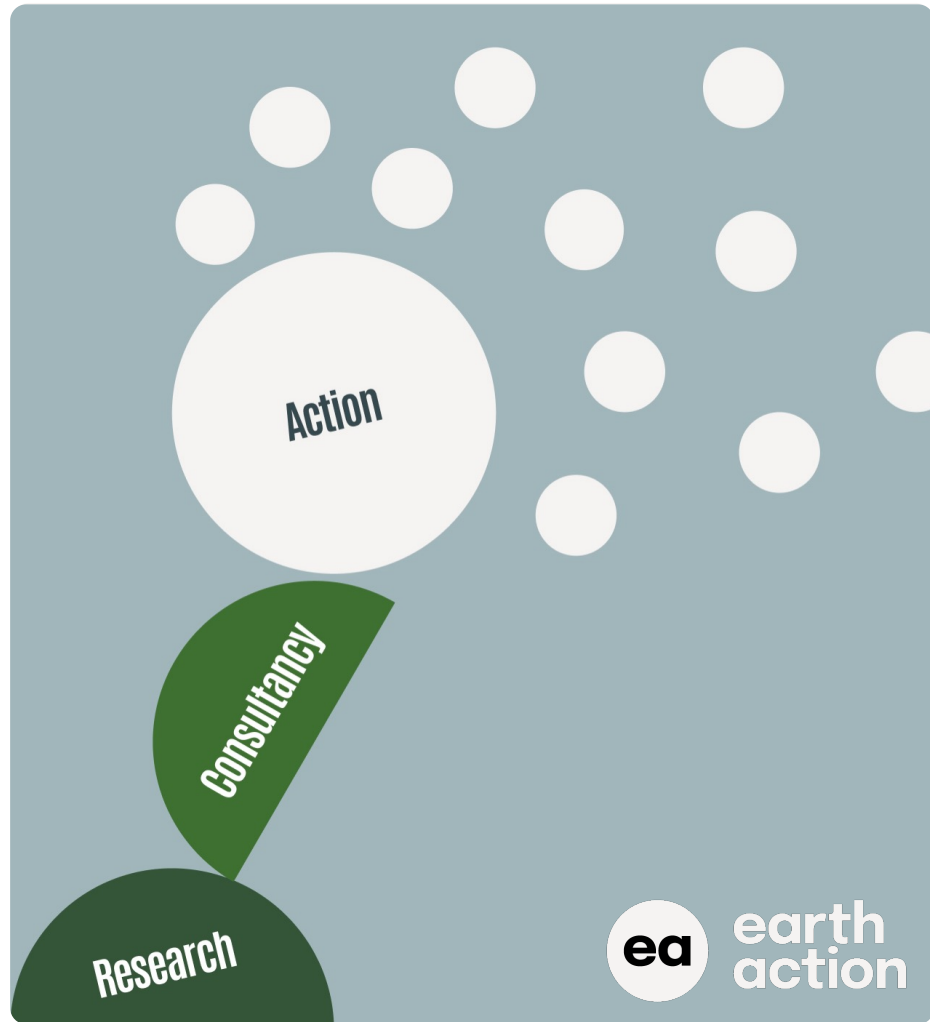
Action

Consultancy

Research

ea earth action

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GUIDING LINE

Context, methodology and data sources

Definitions

Country overview

Results at varying levels of granularity:

- Polymer specific metrics
- Applications type specific metrics
- MWI by Applications x Polymer
- MWI Benchmark
- Leakage situation

Waste import and export

Data quality

Users' conditions

Plasteax

ATLANTIS REPORT

This report is an example of what users can receive for a specific country, focusing solely on post-consumer plastic packaging

2023

Version 2.0. | 2023
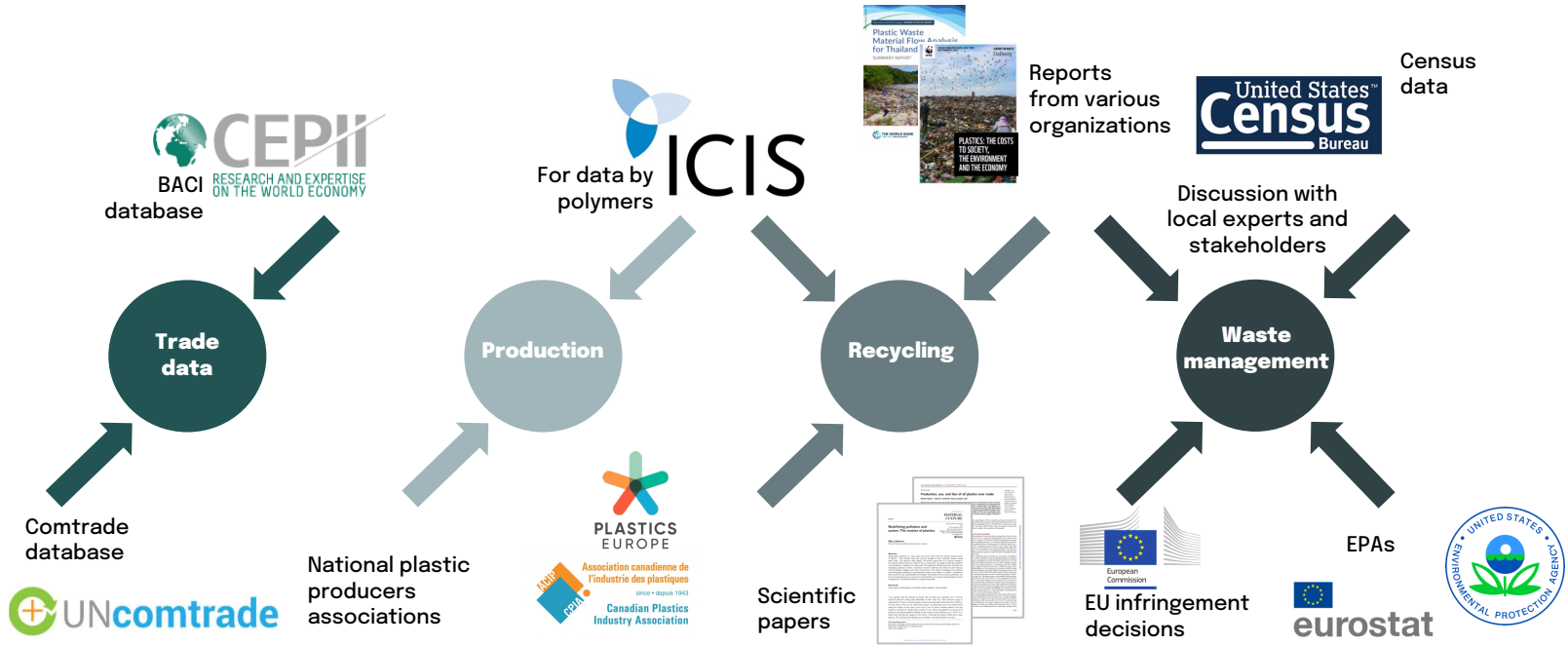
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METHODOLOGY

The Plasteax methodology is built upon the 'United Nations Environment Programme (2020) – National guidance for plastic pollution hotspotting and shaping action – Introduction report' authored by Boucher J., M. Zgola, et al., published by the United Nations Environment Programme.

Using a top-down approach that leverages verified data sources for calculations and a bottom-up approach that incorporates information from peer-reviewed studies and field measurements, Plasteax is capable of generating specific data.

The Plasteax waste assessment methodology is in a state of continuous evolution. The team ensures the incorporation of the latest data and insights to continuously update the methodology.

DATA SOURCES

BACI database

Trade data

Comtrade database

For data by polymers ICIS

Production

National plastic producers associations

Reports from various organizations

Recycling

Scientific papers

Census data

Discussion with local experts and stakeholders

Waste management

EU infringement decisions

EPAs

Plasteax

GUIDING LINE

Context, methodology and data sources

Definitions

Country overview

Results at varying levels of granularity:

- Polymer specific metrics
- Applications type specific metrics
- MWI by Applications x Polymer
- MWI Benchmark
- Leakage situation

Waste import and export

Data quality

Users' conditions

Plasteax

DEFINITIONS

ADDED STOCK

Plastic put on the market on a given year that is not becoming waste within the same year. This part of the plastic input is considered as plastic stock for the given year as it will become waste in another year (e.g. plastic used in construction or automotive). Similarly, though, there will be plastic that was put on the market in previous year and that will become waste in the chosen year. The difference between these two quantities is the added stock.

EXPORT

Export of any plastic by the country, in any form, be it primary polymer, plastic product, or plastic embedded in a product (plastic share in cars or phones). It does not include export of plastic waste.

IMPORT

Import of any plastic in the country, in any form, be it primary polymer, plastic product, or plastic embedded in a product (plastic share in cars or phones). It does not include import of plastic waste.

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DEFINITIONS

PRODUCTION
Polymer production either from primary virgin source or secondary source (recycled plastic from previous year). It does not include the manufacturing of final products in the country, as this would lead to double counting.

WASTE EXPORT
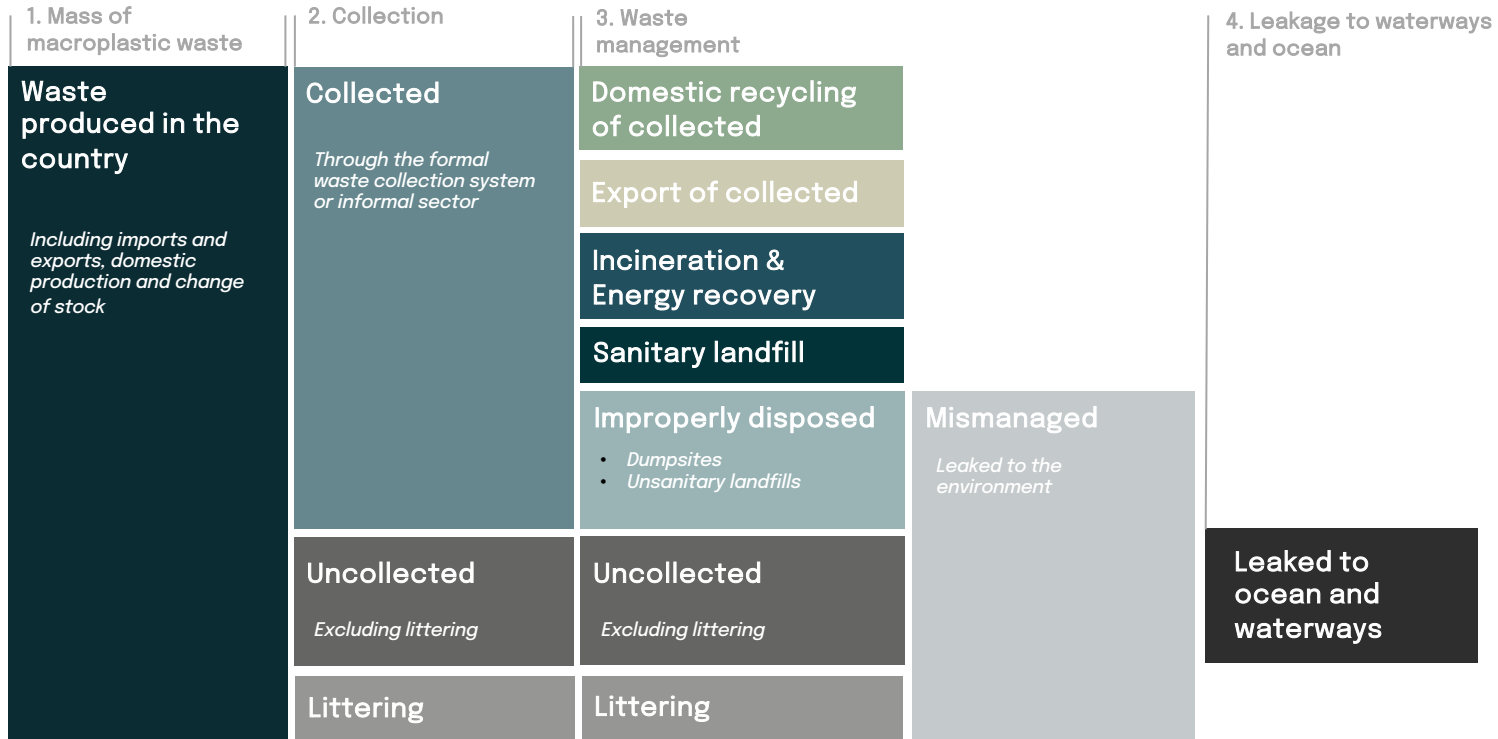Plastic waste collected in the country and exported abroad. It does not include the re-export of imported waste.

WASTE GENERATED
Country domestic plastic waste generation computed as: Production + Import – Export – Added stock.

WASTE IMPORT
Import of plastic waste from other countries.

DEFINITIONS – LEAKAGE PATHWAY

1. Mass of macroplastic waste	2. Collection	3. Waste management		4. Leakage to waterways and ocean

Waste produced in the country

Including imports and exports, domestic production and change of stock

Collected

Through the formal waste collection system or informal sector

Domestic recycling of collected

Export of collected

Incineration & Energy recovery

Sanitary landfill

Improperly disposed
- *Dumpsites*
- *Unsanitary landfills*

Mismanaged

Leaked to the environment

Uncollected

Excluding littering

Uncollected

Excluding littering

Littering

Littering

Leaked to ocean and waterways

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DEFINITIONS

Collected	Waste fraction that is not collected, either by the formal or the informal sector. It includes behavioural littering
Collection rate	Ratio between the plastic waste collected and generated. Waste Collected includes Waste export, Recycling, Properly disposed and Improperly disposed.
Uncollected	Waste fraction that is not collected, either by the formal or the informal sector. It includes behavioural littering.
Recycling	Domestic recycling of waste generated in the country. It does not include recycling of imported waste nor waste collected for recycling in the country that is exported abroad.
Properly disposed	Waste fraction that is disposed in a waste management system where no leakage is expected to occur, such as an incineration facility or a sanitary landfill. We define a sanitary landfill as a particular area where large quantities of waste are deliberately disposed in a controlled manner (e.g. waste being covered on a daily basis, as well as the bottom of the landfill designed in a way to prevent waste from leaching out).
Sanitary landfill	The sanitary landfill is a method of disposing waste on land without disturbing the environment and public health
Incineration & Energy recovery	Incineration with energy recovery refers to incineration processes where the energy created in the combustion process is harnessed for re-use, for example for power generation. Incineration without energy recovery means the heat generated by combustion is dissipated in the environment.
Improperly disposed	Waste fraction that is disposed in a waste management system where leakage is expected to occur, such as a dumpsite or an unsanitary landfill. A dumpsite is a particular area where large quantities of waste are deliberately disposed in an uncontrolled manner and can be the result of both the formal and informal sectors. A landfill is considered as unsanitary when waste management quality standards are not met, thus entailing a potential for leakage.
Mismanaged	It is defined as the sum of uncollected and improperly managed waste.
Mismanaged Waste Index (MWI)	It is defined as the sum of uncollected and improperly managed waste, divided by the waste generated.
Leakage	Plastic that is released to rivers, lakes and oceans.

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DEFINITIONS – POLYMERS

HDPE
High-density polyethylene (e.g., milk containers, shampoo bottles).

LDPE
Low-density polyethylene (e.g., bags, container lids).

PET
Polyethylene terephthalate (e.g., bottles, food wrapping).

POLYESTER
In this study Polyester includes polyester fibres, polyester films and polyester engineered resins.

PP
Polypropylene (e.g., hot food containers, sanitary pad liners).

PS
Polystyrene (e.g., food containers, disposable cups).

EPS
Expanded polystyrene (e.g., food containers, cushioning).

PVC
Polyvinyl chloride (e.g., construction pipes, toys, detergent bottles).

Synthetic Rubber
Used to manufacture tyres.

ABS
Acrylonitrile butadiene styrene (used for rigid non-food packaging)

Other
Any other type of plastic.

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DEFINITIONS – APPLICATIONS

Plasteax provides information for a selected numbers of applications. A wide range of application ca be developed on demand.

BOTTLES
Containers used for storing liquids made out of different polymers and might include all applications (technical, cosmetics, etc.)

PET POTTLES
Containers for drinking purposes made of PET.

FLEXIBLE PACKAGING
All the packaging that is capable of bending easily without breaking.

RIGID FOOD PACKAGING
All the packaging that are unable to bend or be forced out of shape, food grade.

RIGID NON-FOOD PACKAGING
All the packaging that are unable to bend or be forced out of shape, not food grade.

MULTI-LAYER PACKAGING
All the packaging that contain several thermoplastic polymer layers to provide a combination of moisture-and oxygen-barrier, and mechanical properties.
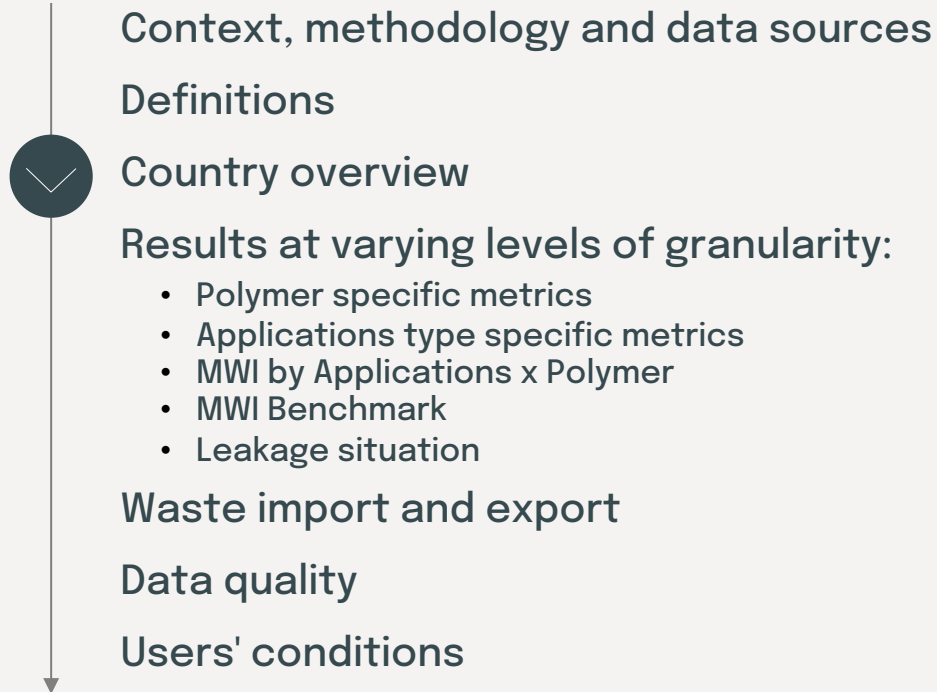
TEXTILES
Textile fabrics containing various polymer types are considered.

HOUSEHOLD, LEISURE, SPORT
Objects containing various plastic polymers such as toys, sanitary towels, diapers, tooth brushes,

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GUIDING LINE

Context, methodology and data sources

Definitions

Country overview

Results at varying levels of granularity:
- Polymer specific metrics
- Applications type specific metrics
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- MWI Benchmark
- Leakage situation

Waste import and export

Data quality

Users' conditions

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COUNTRY OVERVIEW

	Plastic packaging (kt)
Production and import	827
Export	130
Waste Import	15,30
Waste generated	698
Waste export	110,73
Recycling	95
Properly disposed	47
Improperly disposed	60
Uncollected	385

Collection rate
45%

Mismanaged Waste Index (MWI)
64%
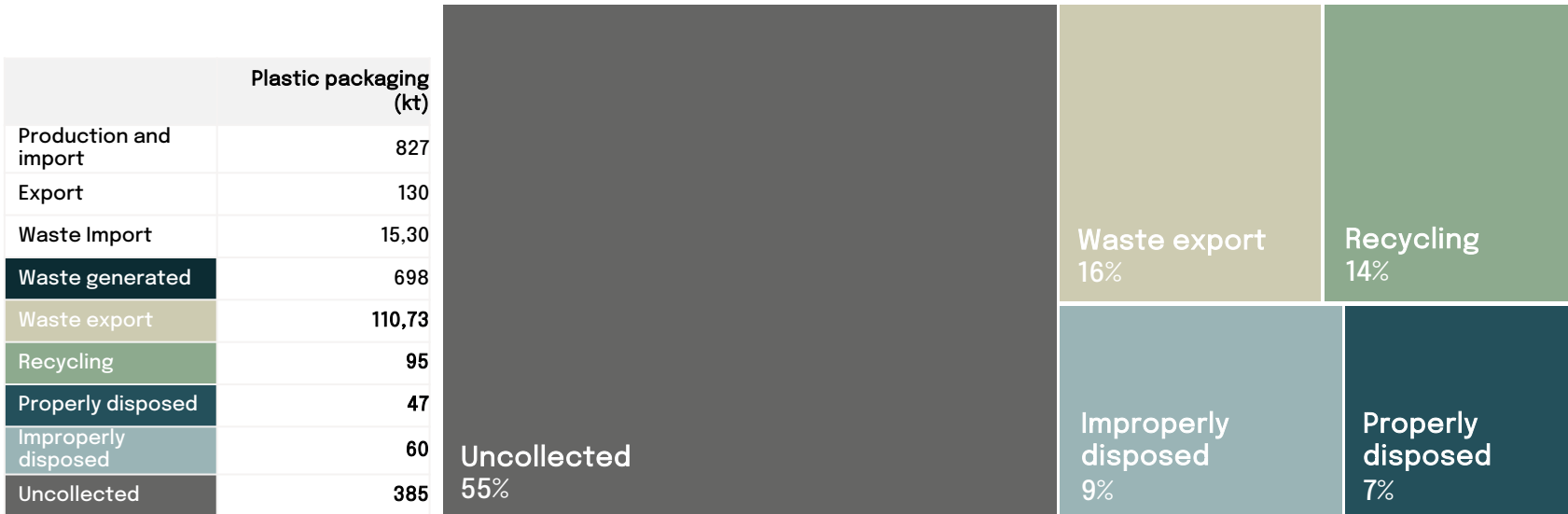
Uncollected
55%

Waste export
16%

Recycling
14%

Improperly disposed
9%

Properly disposed
7%

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GUIDING LINE

Context, methodology and data sources

Definitions

Country overview

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- Leakage situation

Waste import and export
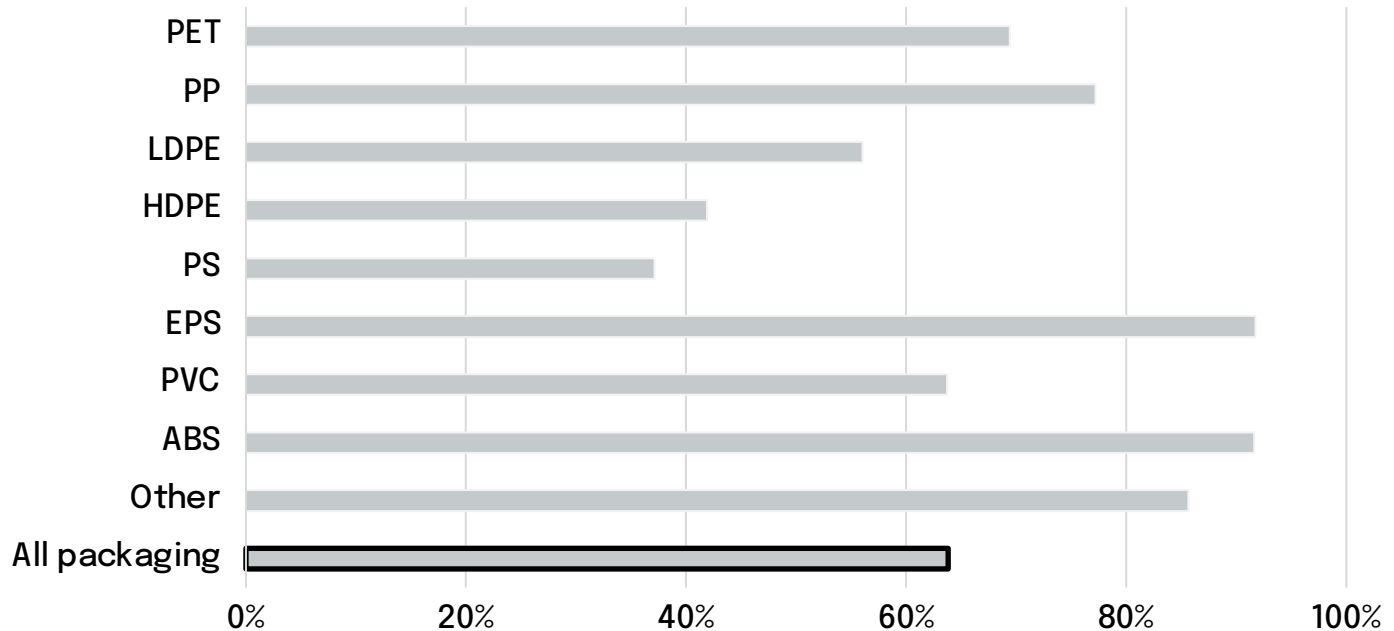
Data quality

Users' conditions

POLYMER SPECIFIC METRICS

	Waste generated (kt)	Recycling	Waste export	Incineration & Energy recovery	Sanitary landfill	Improperly disposed	Uncollected (littered)	Total	Collection rate	MWI
PET	211	19%	4%	0%	8%	9%	60,2%	100%	39,8%	69,4%
PP	182	13%	1%	0%	8%	11%	66,6%	100%	33,4%	77,2%
LDPE	132	4%	35%	0%	5%	8%	48,5%	100%	51,5%	56,0%
HDPE	116	22%	30%	0%	6%	5%	36,4%	100%	63,6%	41,9%
PS	24	0%	60%	0%	3%	5%	32,2%	100%	67,8%	37,1%
EPS	8	0%	0%	0%	8%	13%	78,8%	100%	21,2%	91,7%
PVC	7,5	0%	31%	0%	6%	9%	54,8%	100%	45,2%	63,7%
ABS	0,3	0%	0%	0%	8%	13%	78,5%	100%	21,5%	91,6%
Other	17	0%	7%	0%	8%	12%	73,8%	100%	26,2%	85,6%
All packaging	698	14%	16%	0%	7%	9%	55,2%	100%	44,8%	63,8%

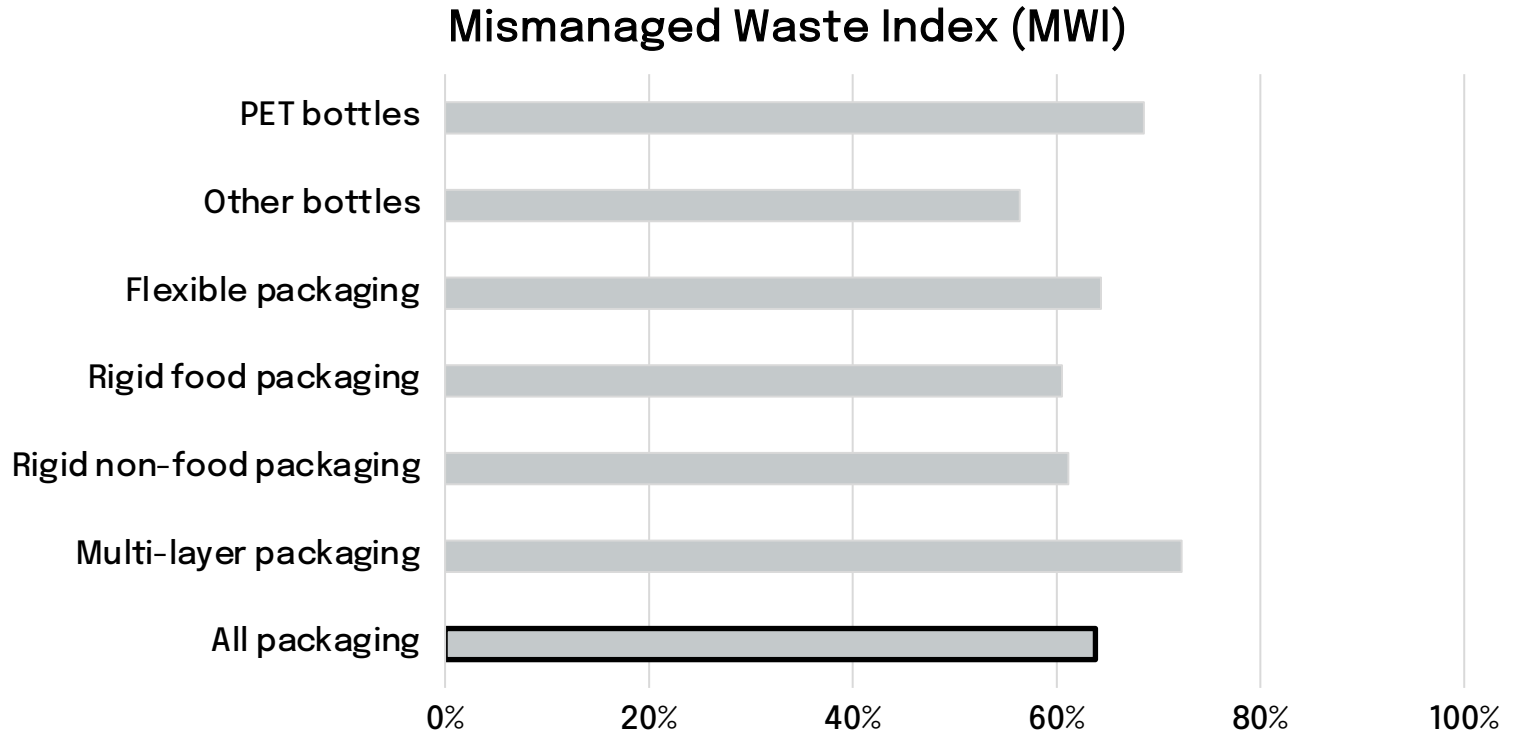**Plasteax**

POLYMER SPECIFIC METRICS

Mismanaged Waste Index (MWI)

APPLICATIONS TYPE

	Waste generated (kt)	Recycling	Waste export	Incineration & Energy recovery	Sanitary landfill	Improperly disposed	Uncollected (littered)	Total	Collection rate	MWI
PET bottles	145	20%	4%	0%	8%	9%	60%	100%	40%	69%
Other bottles	35	21%	15%	0%	7%	8%	48%	100%	52%	56%
Flexible packaging	222	5%	25%	0%	6%	9%	56%	100%	44%	64%
Rigid food packaging	139	21%	11%	0%	7%	8%	53%	100%	47%	61%
Rigid non-food packaging	128	15%	17%	0%	7%	9%	52%	100%	48%	61%
Multi-layer packaging	30	0%	22%	0%	6%	10%	63%	100%	37%	72%
All packaging	698	14%	16%	0%	7%	9%	55%	100%	45%	64%

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APPLICATIONS TYPE

Mismanaged Waste Index (MWI)

Bar chart showing MWI values by application type:
- PET bottles: ~68%
- Other bottles: ~56%
- Flexible packaging: ~64%
- Rigid food packaging: ~60%
- Rigid non-food packaging: ~61%
- Multi-layer packaging: ~72%
- All packaging: ~63%

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MWI BY CATEGORY X POLYMER FOR DOMESTIC PACKAGING WASTE

	HDPE	LDPE	PP	PS	PVC	EPS	ABS	PET	Other
PET bottles	-	-	-	-	-	-	-	68,5%	-
Other bottles	33,2%	57,8%	71,9%	-	63,6%	-	-	68,1%	85,4%
Flexible packaging	51,7%	55,5%	86,9%	-	64,0%	-	-	83,6%	85,7%
Rigid food packaging	33,5%	58,3%	72,0%	-	63,9%	92,0%	-	68,5%	85,7%
Rigid non-food packaging	33,2%	57,8%	71,6%	37,1%	63,6%	91,6%	91,6%	-	85,4%
Multi-layer packaging	56,3%	58,6%	90,6%	-	64,0%	-	-	-	85,8%

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MWI benchmark

Learn about the methodology behind these metrics here:
https://www.plasteax.earth

Sources	Ref	MWI	Ref. year
Plasteax	-	70%	2019
Jambeck et al. 2015	(1)	83%	2010
Lebreton & Andrady 2019	(2)	85%	2015
PLP 2020	(3)	85%	2016
WWF ReSource 2020	(4)	83%	2010

(1) Jambeck, J. R., Geyer, R., Wilcox, C., Siegler, T. R., Perryman, M., Andrady, A., ... & Law, K. L. (2015). Plastic waste inputs from land into the ocean. Science, 347(6223), 768-771.
(2) Lebreton, L., & Andrady, A. (2019). Future scenarios of global plastic waste generation and disposal. Palgrave Communications, 5(1), 1-11.
(3) PLP (2020). Plastic Leak Project. (https://quantis-intl.com/metrics/initiatives/plastic-leak-project/)
(4) WWF (2020). ReSource Footprint Tracker: Methodology overview. https://resource plastic.com/pdf/ReSource_Footprint_Tracker_Methodology_Overview_2020.pdf

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LEAKAGE SITUATION

Leakage in the Ocean and Waterways rom domestic post-consumer packaging based on 10% release rate.
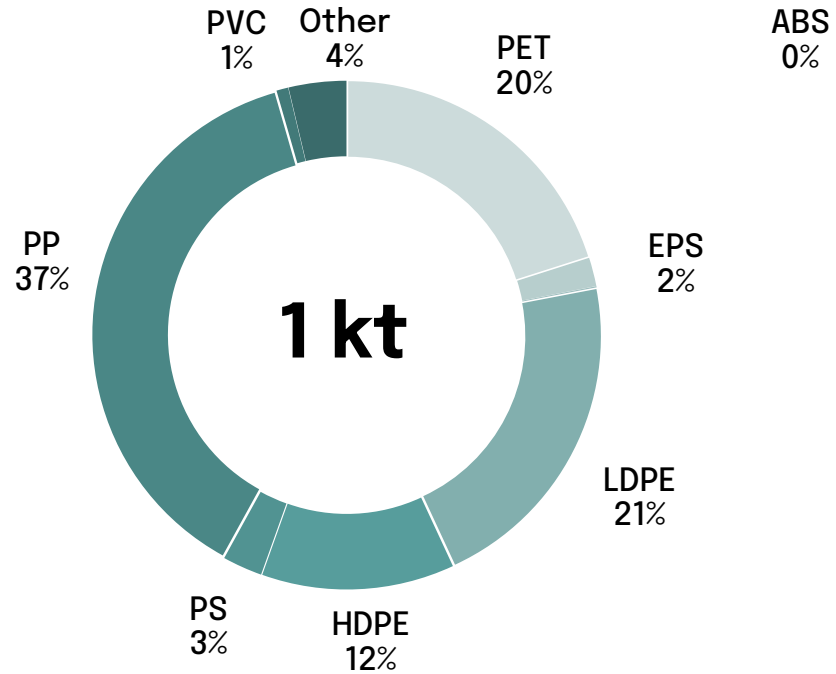
PVC 1%

Other 4%

PET 20%

ABS 0%

EPS 2%

LDPE 21%

HDPE 12%

PS 3%

PP 37%

1 kt

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GUIDING LINE

Context, methodology and data sources

Definitions

Country overview

Results at varying levels of granularity:

- Polymer specific metrics
- Applications type specific metrics
- MWI by Applications x Polymer
- MWI Benchmark
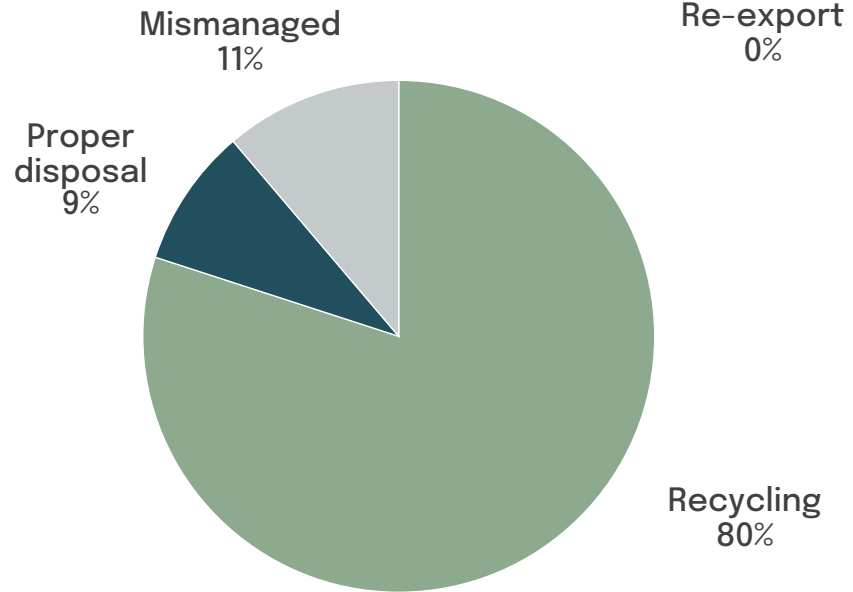- Leakage situation

Waste import and export

Data quality

Users' conditions

WASTE IMPORT MANAGEMENT

Waste import management
based on import profile A

Total waste
import
15kt

Mismanaged
11%

Re-export
0%

Proper
disposal
9%

Recycling
80%

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TOP 20 IMPORTERS OF COUNTRY'S PLASTIC WASTE EXPORT

Total waste export 1,11kt

Exporter	Importer	Plastic waste in kt	Share by weight	Proximity*
Atlantis	China	39,3	36%	0
Atlantis	Other Asia, nes	28,4	26%	0
Atlantis	Viet Nam	20,5	19%	0
Atlantis	Rep. of Korea	12,2	11%	0
Atlantis	USA	1,9	2%	0
Atlantis	China, Hong Kong SAR	1,3	1%	0
Atlantis	Spain	1,0	1%	0
Atlantis	Slovenia	1,0	1%	0
Atlantis	Malaysia	1,0	1%	0
Atlantis	Ukraine	0,7	1%	0
Atlantis	South Africa	0,6	1%	0
Atlantis	Bulgaria	0,6	1%	0
Atlantis	Netherlands	0,5	0%	0
Atlantis	Austria	0,3	0%	0
Atlantis	Belgium	0,3	0%	0
Atlantis	India	0,3	0%	0
Atlantis	Thailand	0,2	0%	0
Atlantis	Japan	0,2	0%	0
Atlantis	United Arab Emirates	0,2	0%	0
Atlantis	Germany	0,1	0%	0

*The distinction between local and non-local countries is based on preliminary rules provided in the methodology on export fate and credits

Plasteax

GUIDING LINE

Context, methodology and data sources

Definitions

Country overview

Results at varying levels of granularity:
- Polymer specific metrics
- Applications type specific metrics
- MWI by Applications x Polymer
- MWI Benchmark
- Leakage situation

Waste import and export

Data quality

Users' conditions

Plasteax

DATA QUALITY

The data quality pedigree matrix is used to assess data quality . Four key criteria are evaluated to assess the data quality:
Reliability - Temporal correlation - Geographical correlation - Granularity

This table introduces the specific score for each input data.
Learn about the methodology on data quality: https://www.plasteax.earth

Input data	Reference	Quality score*
Trade import/export	Gaulier, G., & Zignago, S. (2010). Baci: international trade database at the product-level (the 1994-2007 version).; WWF (2021). EPR scheme assessment for plastic packaging waste in the Philippines.	B
Primary production	ICIS (2021). Data on worldwide plastic production.; World Bank Group (2021). Market Study for the Philippines: Plastics Circularity Opportunities and Barriers.	A
Recycling	ICIS (2021). Data on worldwide plastic production.	A
Collection	WWF (2021). EPR scheme assessment for plastic packaging waste in the Philippines.	A
Waste management	WWF (2021). EPR scheme assessment for plastic packaging waste in the Philippines.	A

*A= very good data quality, B= Good data quality, C= Average data quality, D= Poor data quality, E= Very poor data quality
Source: UNEP (2020). National Guidance for Plastic Pollution Hotspotting and Shaping Action

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GUIDING LINE

Context, methodology and data sources

Definitions

Country overview

Results at varying levels of granularity:

- Polymer specific metrics
- Applications type specific metrics
- MWI by Applications x Polymer
- MWI Benchmark
- Leakage situation

Waste import and export

Data quality

Users' conditions

Plasteax

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PLASTEA*X* is a data platform dedicated to plastic environmental analytics which discloses plastic waste management and plastic leakage metrics
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