PLASTEAX
plastic environmental analytics

PLASTEAX
Introduction & methodology

PLASTEAX DOCUMENTATION

11/2022

powered by **ea**

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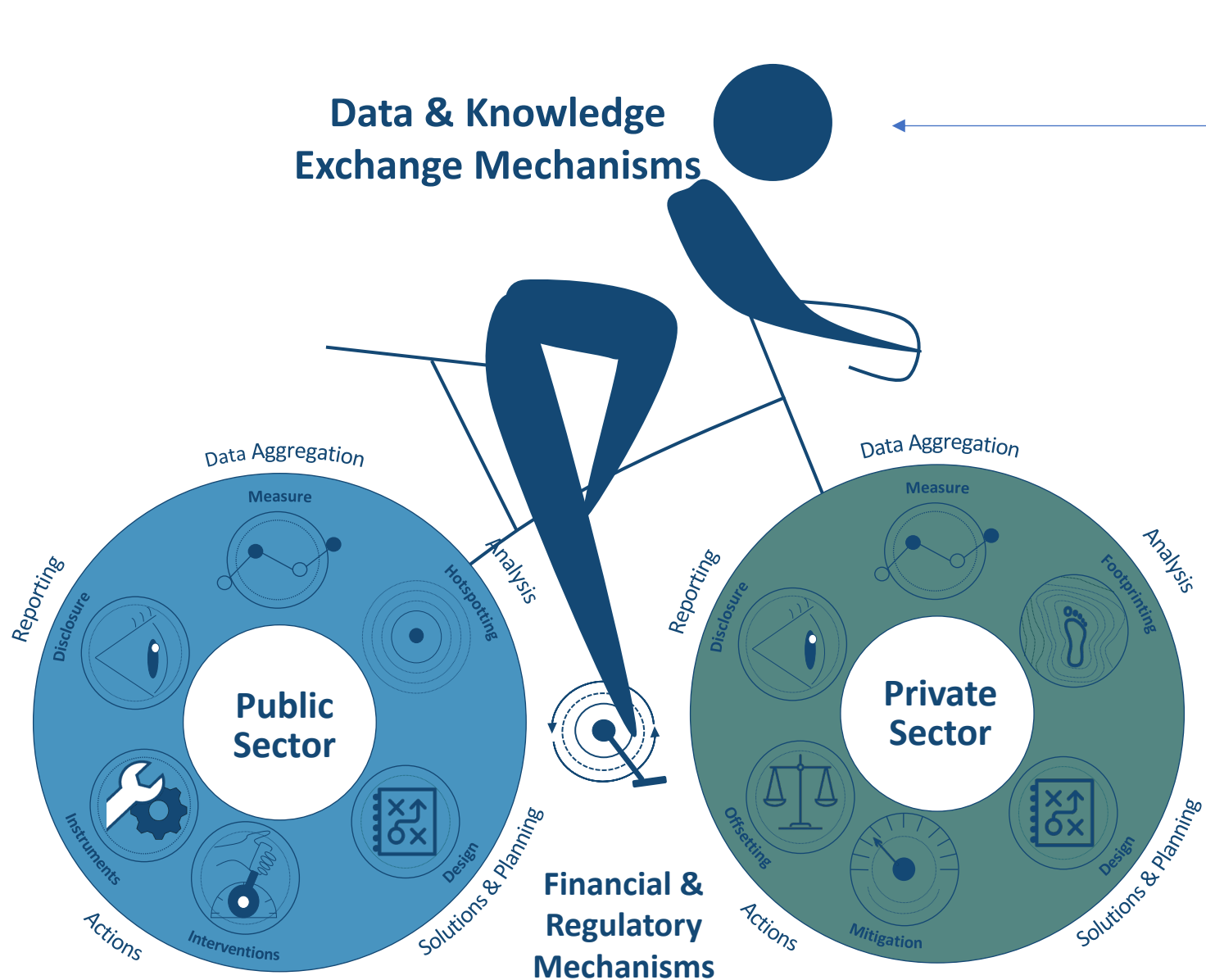
www.plasteax.org

PLASTEA*X* is being developed by
EA – Environmental Action

www.e-a.earth

Contact us : contact@plasteax.org

PLASTEAX
plastic environmental analytics

powered by ea

Why PLASTEAX ?

Data & Knowledge Exchange Mechanisms

Financial & Regulatory Mechanisms

Public Sector

Private Sector

https://www.plasticfootprint.earth/the-bicycle-model

Guiding line

Part 1

PLASTEAX **INTRODUCTION**

What is PLASTEAX ?

PLASTEAX coverage and granularity

The anatomy of a PLASTEAX report

Key features of PLASTEAX

Part 2

PLASTEAX **METHODOLOGY**

Basic principles

Data sources

Modelling routes

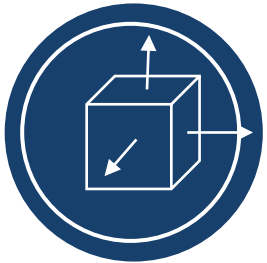PLASTEAX
plastic environmental analytics

powered by ea

PLASTEAX
plastic environmental analytics

Part 1

PLASTEAX **INTRODUCTION**

powered by ea

What is PLASTEAX ?

A DataBase — intending to provide best in class information about plastic waste management worldwide

A Model — originally developed with IUCN and UNEP as part of the National Guidance for Plastic Pollution and Shaping Action
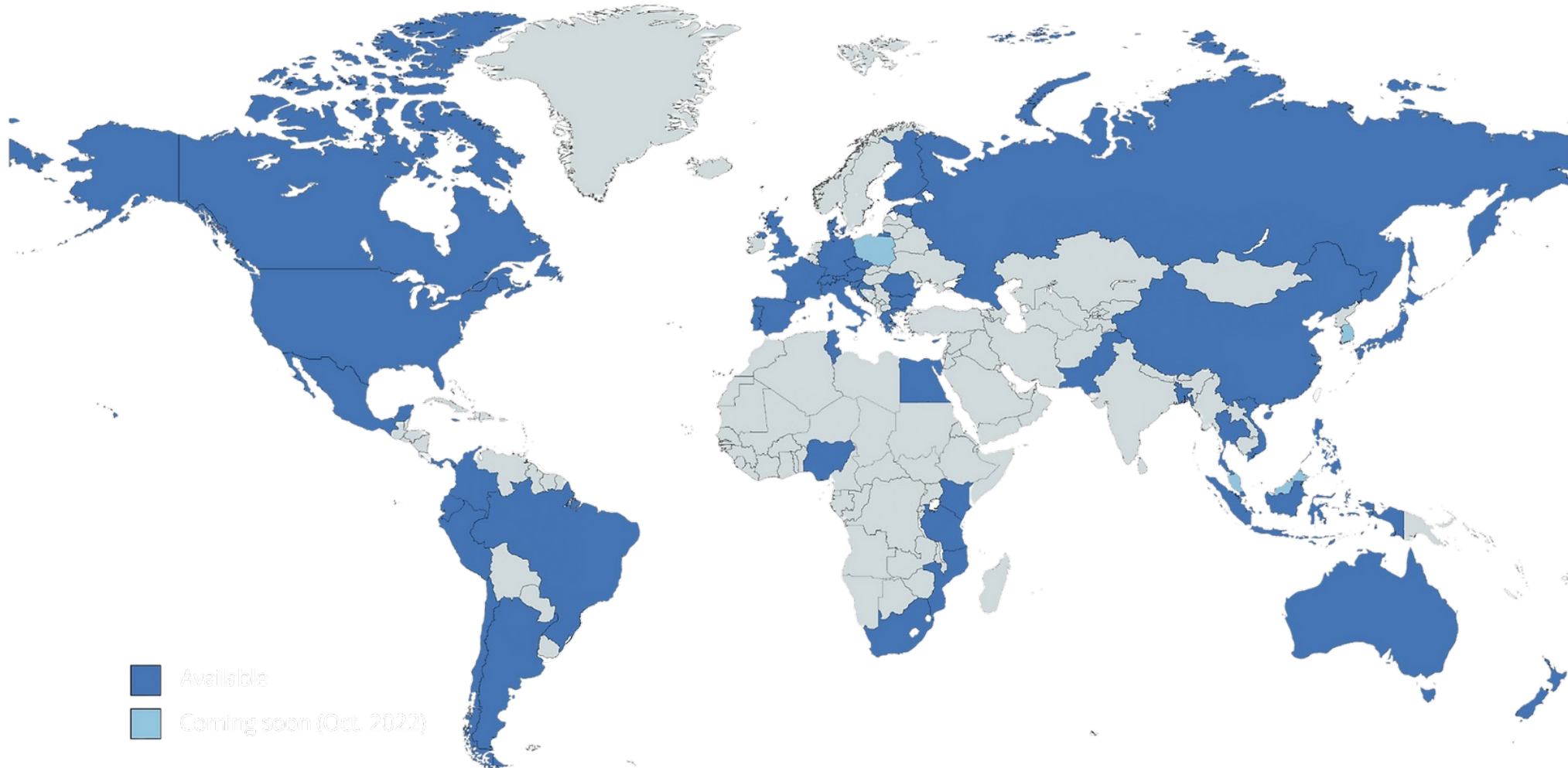
A Process — to keep the information up to date and to increase its granularity with a well-defined governance

PLASTEAX
plastic environmental analytics

powered by ea

Geographical coverage
50 countries as of nov. 2022

Available

Coming soon (Oct. 2022)

PLASTEAX
plastic environmental analytics

powered by ea

PLASTEAX current granularity

Indicators

✓ Managed waste

(incineration, sanityry landfill)

✓ Recycling

✓ Mismanaged waste

(incl. uncollected, dumped, burned

and littered)

✓ Leakage

(direct/indirect)

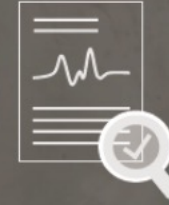## Scope

✓ Packaging sector

✓ Per polymer

✓ Per application

To come (2023)

✓ Textile sector

✓ Regionalized release rate
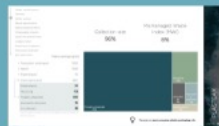
✓ Additives

PLASTEAX
plastic environmental analytics
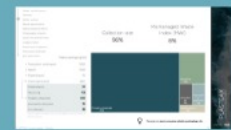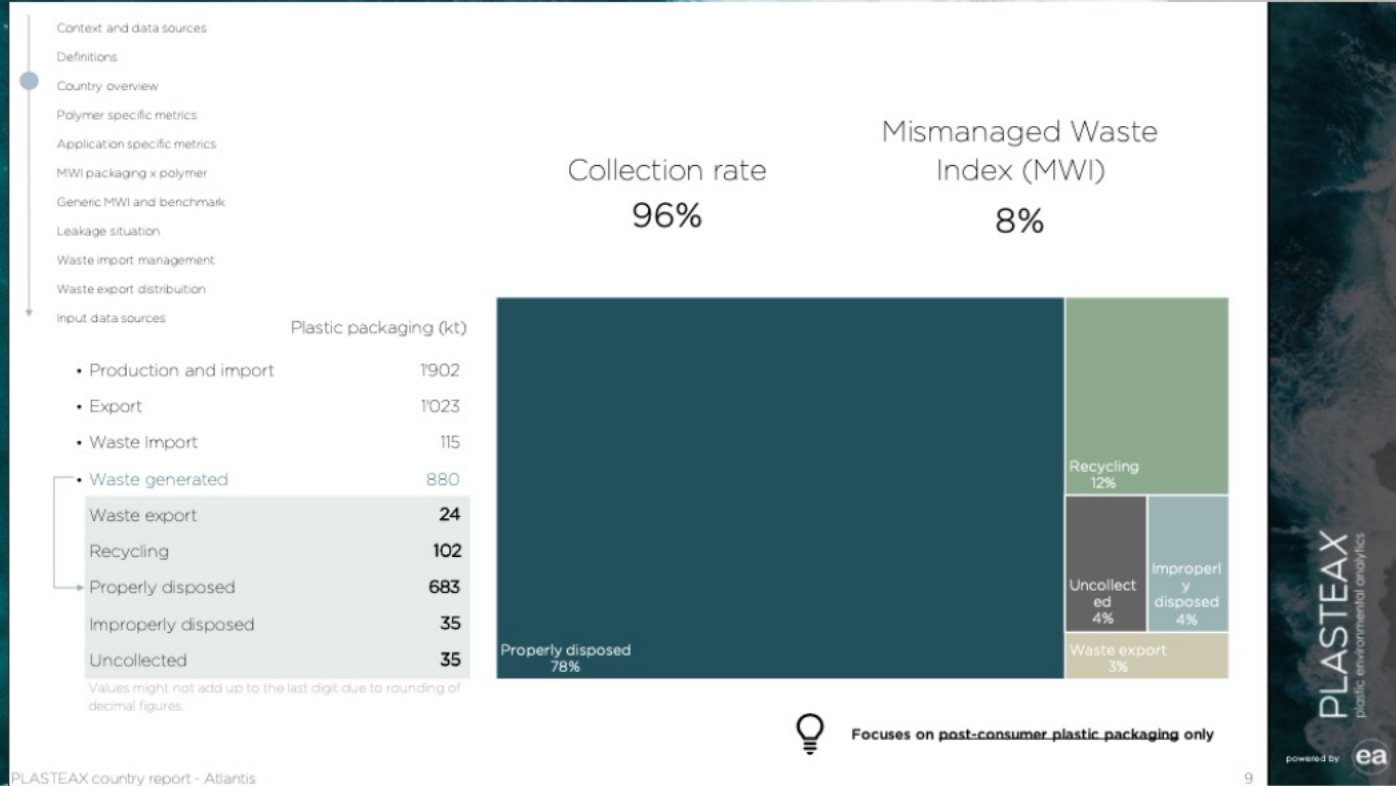
powered by ea

THE PLASTEAX REPORT ANATOMY

A journey across the standard report provided for each available country

THE COUNTRY'S OVERVIEW

The treemap provides in brief the plastic situation in a country

www.plasteax.org

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.

Collection rate
Ratio between the plastic waste collected and generated. Waste Collected includes: Waste export, Recycling, Properly disposed and Improperly disposed.

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.

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.

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.

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).

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.

Uncollected
Waste fraction that is not collected, either by the formal or the informal sector. It includes behavioural littering.

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.
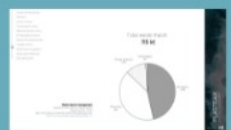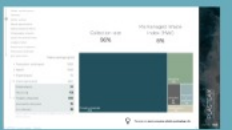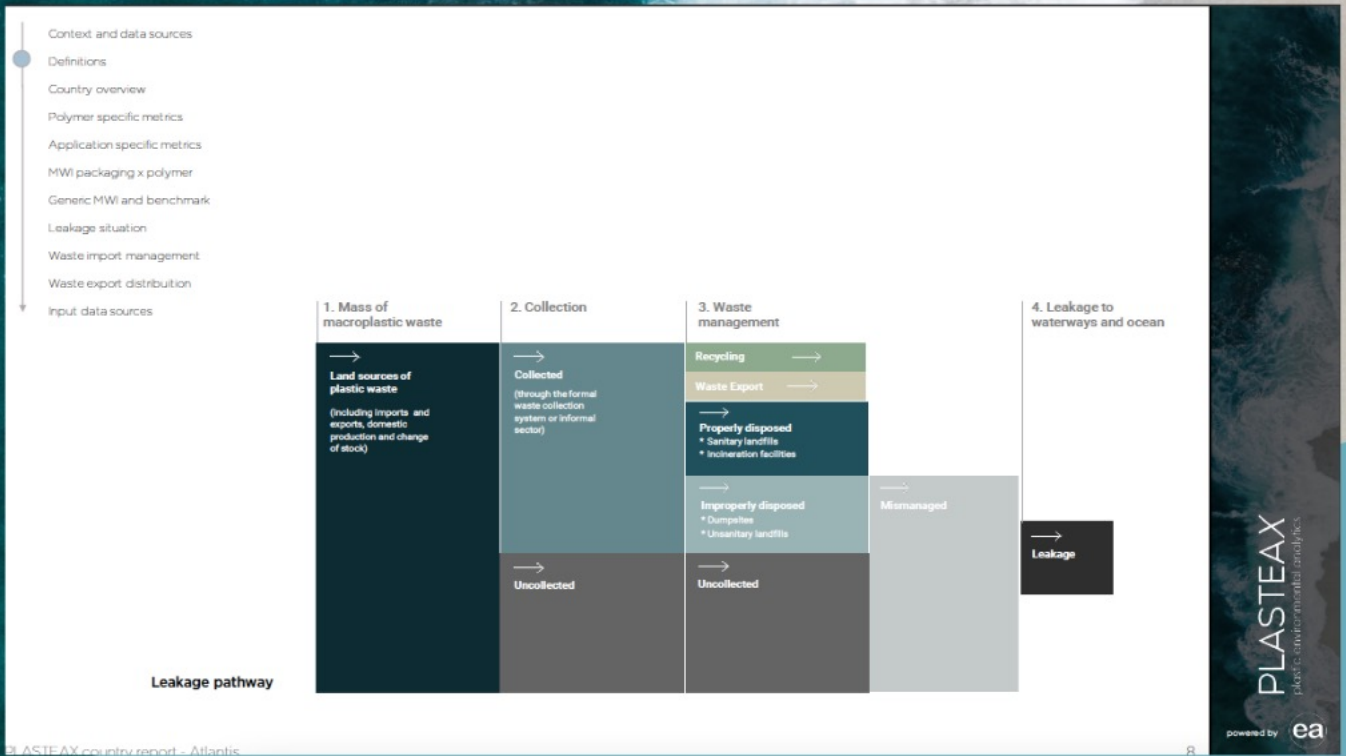
Waste import
Import of plastic waste from other countries.

PLASTEAX

plastic environmental analytics

powered by
ea

ATLANTIS
PLASTEAX Dataset

HARMONIZED DEFINITIONS

Key definitions used consistently for all countries

www.plasteax.org

THE PLASTIC JOURNEY

Flow diagram shows the pathways from production to leakage

www.plasteax.org

Best in class
Polymer specific metrics
Baseline year : 2019

Polymer type	Waste generated (kt)	Recycling	Waste export	Properly disposed	Improperly disposed	Uncollected (littered)	Total	Collection rate	MWI
PET	343	7%	3%	81%	4%	5.4%	100%	95%	9.2%
PP	135	24%	3%	66%	4%	3.4%	100%	97%	7.6%
LDPE	206	16%	3%	73%	4%	3.6%	100%	96%	7.7%
HDPE	142	12%	3%	78%	4%	2.9%	100%	97%	7.0%
PS	10	8%	3%	83%	4%	2.7%	100%	97%	6.6%
EPS	16	18%	2%	75%	4%	1.2%	100%	99%	4.8%
PVC	5	4%	3%	86%	4%	2.3%	100%	98%	6.7%
ABS	3	0%	3%	92%	5%	0.5%	100%	100%	5.2%
Other	18	0%	3%	89%	5%	3.3%	100%	97%	7.9%
Packaging	880	12%	3%	78%	4%	4.0%	100%	96%	8.0%

💡 **Focuses on post-consumer plastic packaging only**

PLASTEAX
plastic environmental analytics

powered by **ea**

NOT ALL PLASTICS IS CREATED EQUAL

Best in class Polymer specific metrics

www.plasteax.org

Best in class
Packaging category specific metrics
Baseline year: 2019

Application type	Waste generated (kt)	Recycling	Waste export	Properly disposed	Improperly disposed	Uncollected	Total	Collection rate	MWI
PET bottles	236	8%	3%	80%	4%	6%	100%	9.4%	9.7%
Other bottles	80	13%	3%	79%	4%	1%	100%	9.9%	4.8%
Flexible packaging	260	12%	3%	77%	4%	4%	100%	9.6%	8.2%
Rigid food packaging	163	12%	3%	76%	4%	5%	100%	9.5%	8.8%
Rigid non-food packaging	114	16%	3%	77%	4%	1%	100%	9.9%	4.9%
Multi-layer packaging	28	9%	3%	78%	4%	6%	100%	9.4%	10.3%

💡 **Focuses on** <u>post-consumer plastic packaging</u> only

PLASTEAX
plastic environmental analytics
powered by ea
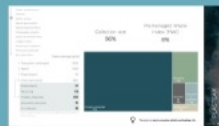
A MULTIDIMENSIONAL ISSUE

Packaging category specific metrics: polymers and applications

www.plasteax.org

Best in class

MWI by packaging category x polymer

Baseline year : 2019

	HDPE	LDPE	PP	PS	PVC	EPS	ABS	PET	Other
PET bottles	-	-	-	-	-	-	-	14.7%	-
Other bottles	4.6%	4.7%	7.4%	-	5.0%	-	-	4.5%	5.5%
Flexible packaging	9.2%	7.5%	10.5%	-	9.9%	-	-	8.6%	8.5%
Rigid food packaging	8.8%	8.9%	9.0%	-	9.2%	8.4%	-	8.7%	9.5%
Rigid non-food packaging	4.6%	4.7%	4.7%	6.6%	5.0%	4.1%	5.2%	-	5.4%
Multi-layer packaging	10.6%	10.1%	-	-	10.6%	-	-	-	10.6%

💡 Focuses on <u>post-consumer plastic packaging</u> only

PLASTEAX

plastic driven material analytics

powered by ea

POLYMERS AND APPLICATIONS

MWI by packaging category for each polymer

www.plasteax.org

WHAT HAPPENS TO THE IMPORT?

Insights on the plastic waste import management in the country

www.plasteax.org

Total waste export
77 kt

Exporter	Importer	Plastic waste in kt	Share by weight	Proximity
Atlantis	Czechia	8.2	34%	Local
Atlantis	Germany	5.2	21%	Local
Atlantis	Slovenia	2.9	12%	Local
Atlantis	Italy	1.2	5%	Local
Atlantis	Switzerland	1.0	4%	Local
Atlantis	Netherlands	1.0	4%	Local
Atlantis	Slovakia	0.9	4%	Local
Atlantis	Bulgaria	0.8	3%	Local
Atlantis	France	0.6	2%	Local
Atlantis	USA	0.4	2%	Non-local
Atlantis	Poland	0.4	2%	Local
Atlantis	Belgium	0.2	1%	Local
Atlantis	Sweden	0.2	1%	Non-local
Atlantis	Hungary	0.1	1%	Local
Atlantis	Croatia	0.1	1%	Local
Atlantis	Serbia	0.1	1%	Local
Atlantis	Romania	0.1	0%	Local
Atlantis	Luxembourg	0.1	0%	Local
Atlantis	United Kingdom	0.1	0%	Non-local
Atlantis	Estonia	0.1	0%	Non-local
		Total export covered:	98%	

**Top 20 Importers
of country's plastic waste export**
Baseline year - 2019
Learn more about export fate and credits
methodology here:
https://www.plasteax.org/methodology-v2

PLASTEAX

plastic environmental analytics

powered by ea

PVC
1%

Other
2%

PP
15%

PET
43%

PS
1%

0,7 kt

HDPE
14%

EPS
1%

Leakage in the Ocean and waterways
from post-consumer packaging
based on 10% release rate
Baseline year - 2019
Learn more about the
methodology behind the leakage calculation here:

LDPE
23%

ABS

PLASTEAX

plastic environmental analytics

powered by ea

LEAKAGE OVERVIEW

Leakage in Ocean and waterways from post-consumer packaging

www.plasteax.org

Why choosing PLASTEAX

- **State of the art methodology** and best available datasets

- **Fully mass balanced approach** combining top-down modelling and bottom-up data collection allowing for a good level a redundancy and validation

- Approach allowing full **consistency of the datasets within a country and across countries**

- Data is provided with **full support for their usage** (Plastic Footprint Network)

They trust PLASTEAX already

PLASTEA**X**
plastic environmental analytics

Part 2

PLASTEAX **METHODOLOGY**

powered by **ea**

From primary material to waste

Production + (Import – Export) = Net Input

From waste to leakage

Import
in primary form or products

Export
in primary form or products

Net input

Change in stock

Production
in primary form

Waste produced in the country

Waste produced in the country

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

Leaked to ocean and waterways

Uncollected
Excluding littering

Uncollected
Excluding littering

Littering

Littering

PLASTEAX
plastic environmental analytics

powered by ea

Behind the scenes - The complexity

PACKAGING CATEGORY

Bottles

Flexible non-food packaging

Rigid food packaging
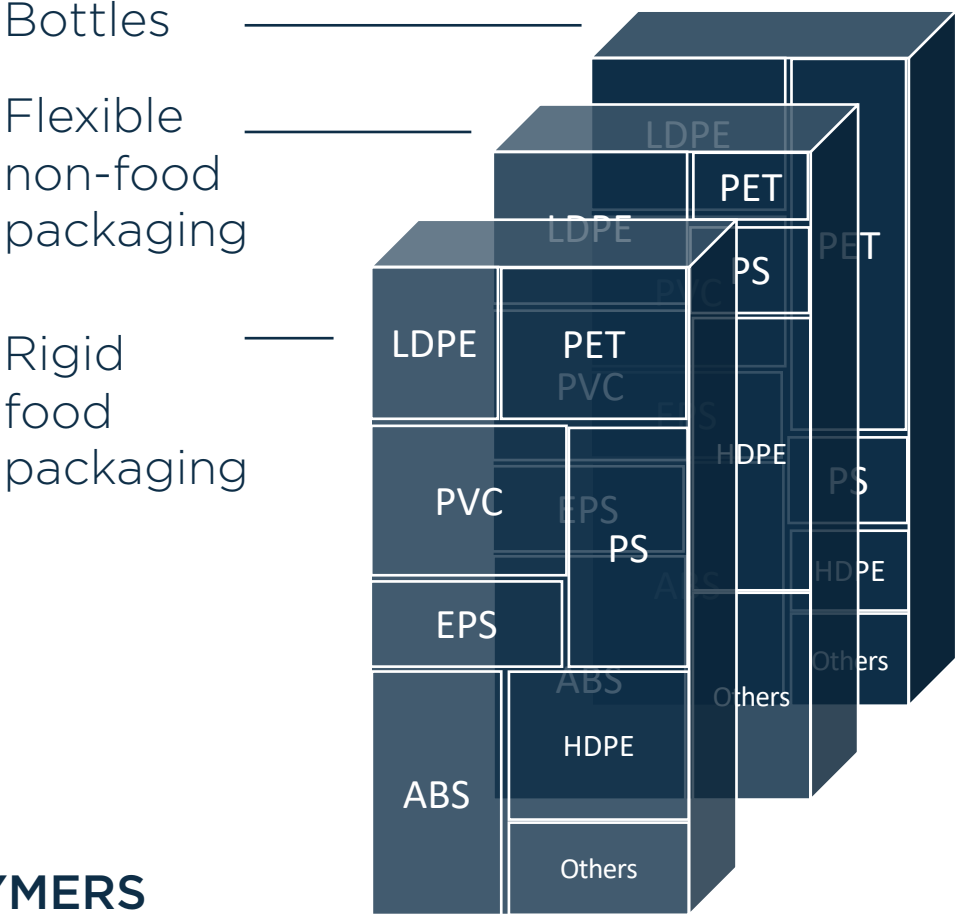
POLYMERS

POLYMERS

The PLASTEAX's approach is MULTI - dimensional

For each category the various polymers are differentiated. This split by polymer and category is available at each level of the waste diagram - see next page.

For more info:
www.plasticfootprint.earth

ATTENTION: These are NOT real information, the boxes are designed for explanatory purposes only

PLASTEAX
plastic environmental analytics

powered by ea

Behind the scenes - The complexity
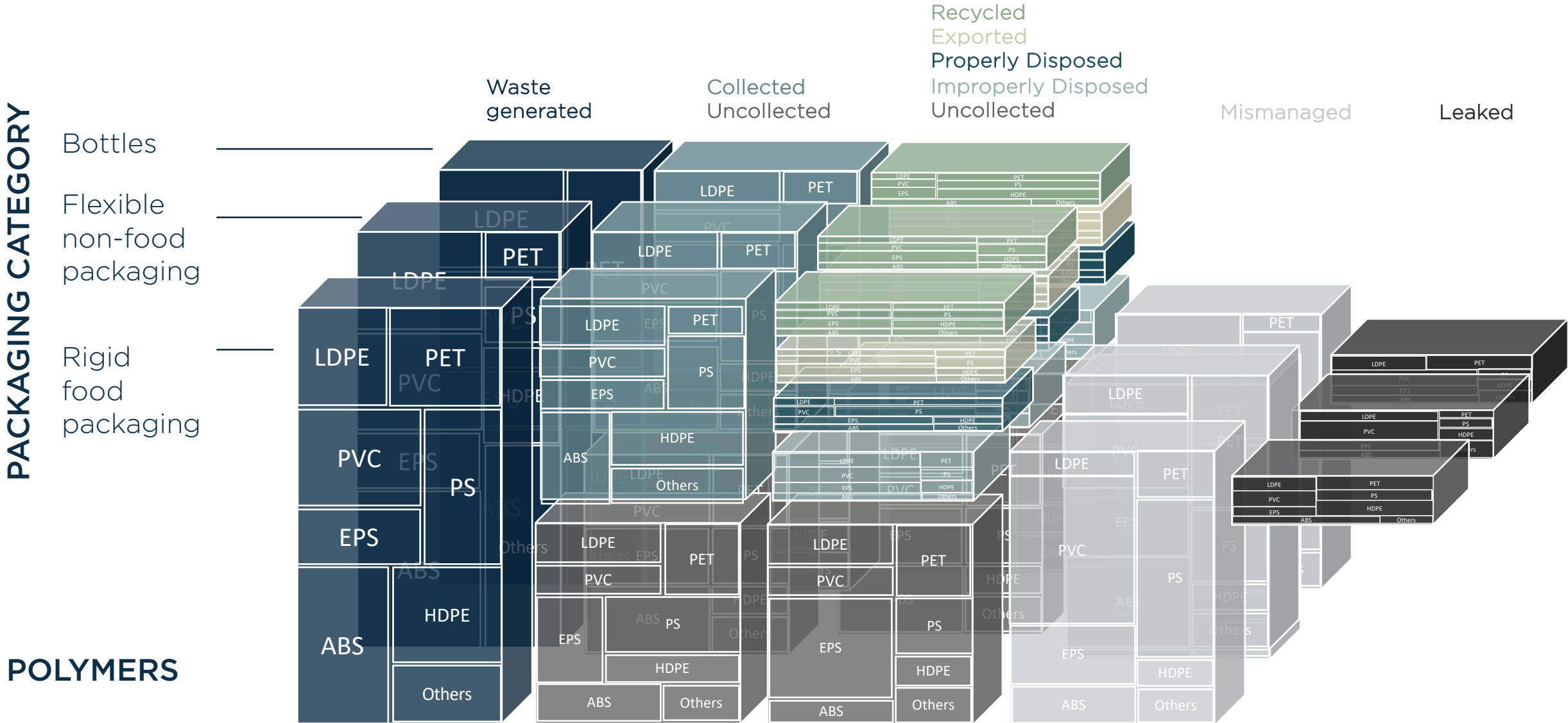
ATTENTION: These are NOT real information, the diagram is being designed for explanatory purposes only

Mapping strategy

The PLASTEAX approach is TOP-DOWN

A top-down approach is a strategy for processing information where a whole system is broken down into its component parts.

In the PLASTEAX case, for each country, from market data on single polymer inputs the model derives category and sector specific plastic data.

Bottles

Flexible non-food packaging

Rigid food packaging

Packaging category

OUTPUT
Country - specific

INPUT
Country – specific

Polymer
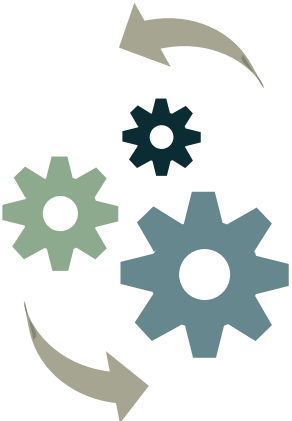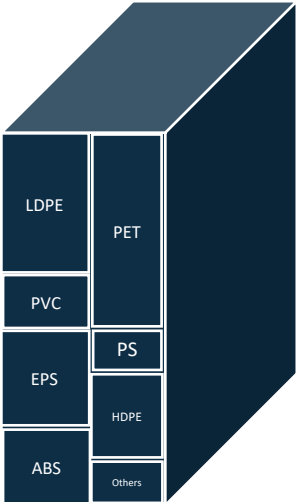
OPERATOR
Region – specific
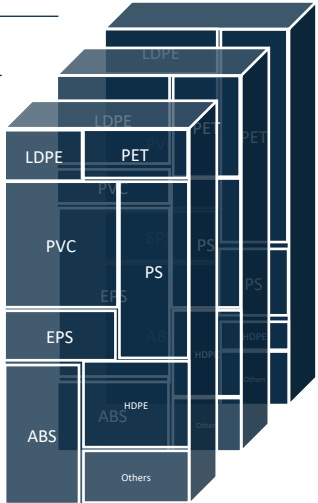
The modelling, The basis

IUCN methodology for the general modelling

Text text text text
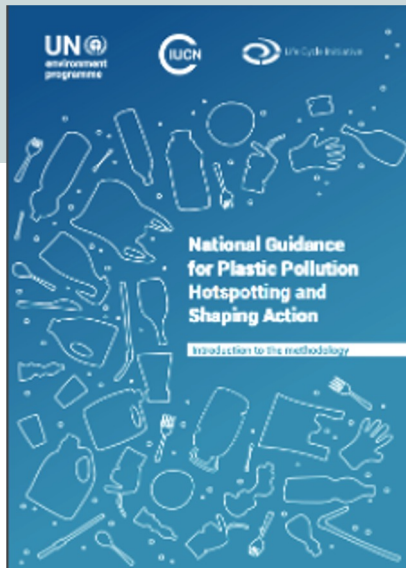
PLP For the release rate

Text text text text

ICF, Eunomia for the Littering

Text text text text
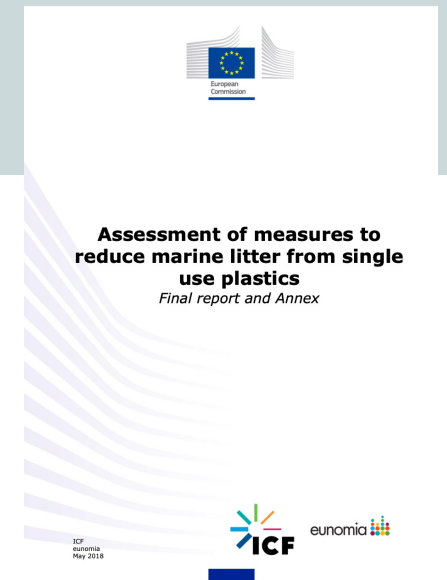
Data sources

Modelling phases

A

B

C

D

E
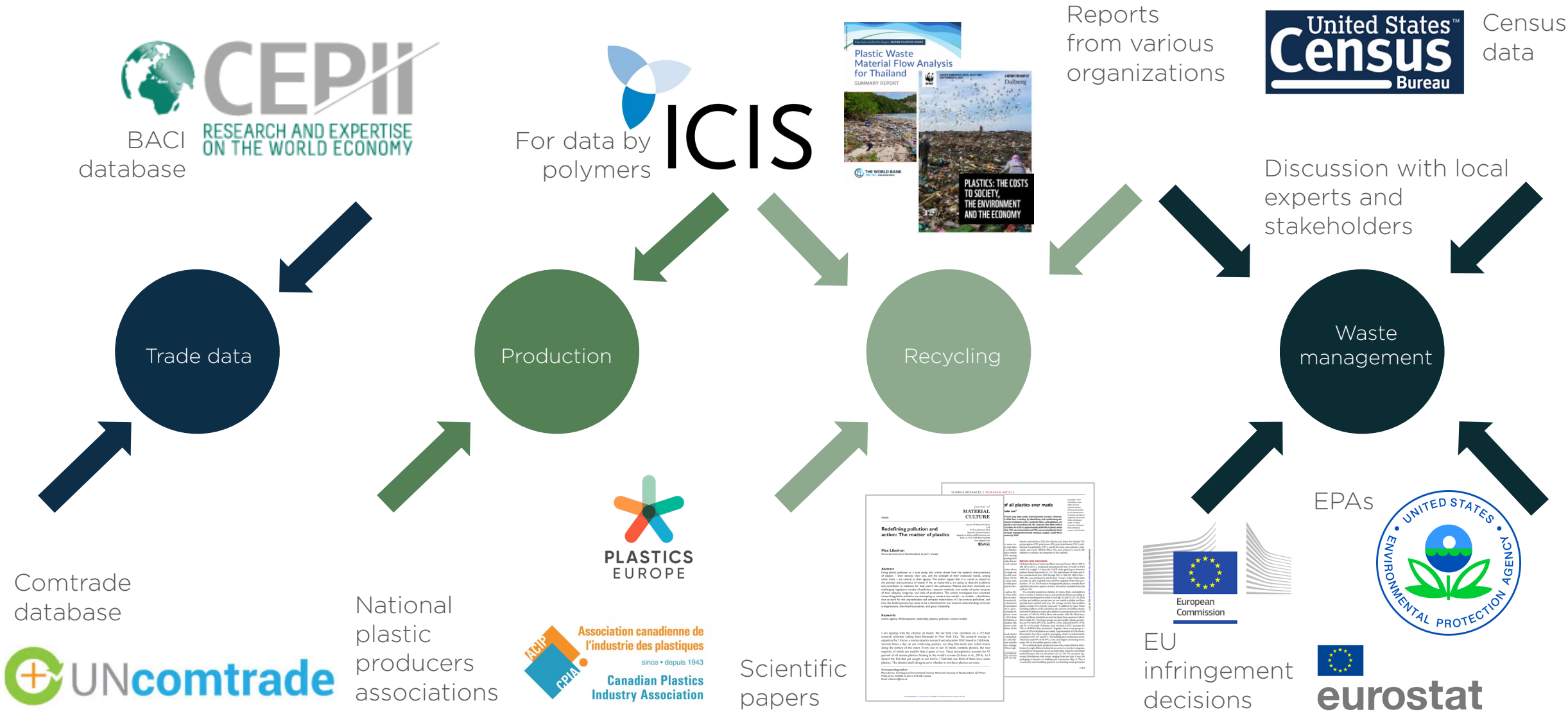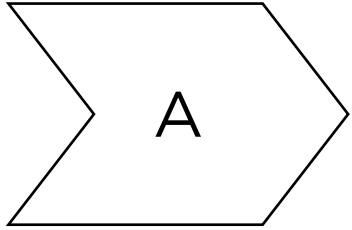
Phase A consists in computing the **amount of waste generation** in the country, by sector and by polymer.

This is done by computing the net input by polymer (i.e. plastic consumption) in the year of interest using import, export and production of plastic by polymer.
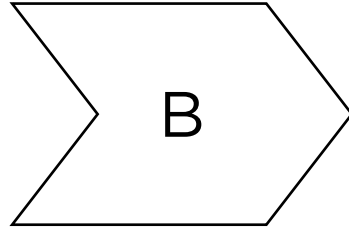
Phase B consists in using information of municipal solid waste management to determine the fate of plastic from the consumer packaging sector.
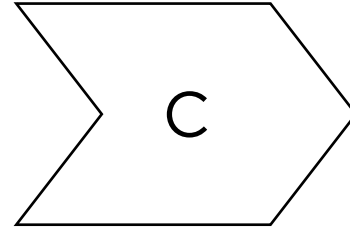
Phase C determines waste generation and waste management for the packaging sector by polymer & category.
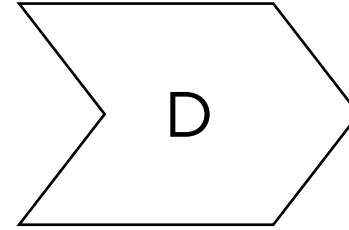
Phase D, analyses the trade of waste, giving insights on both import and exports, by polymer, sector and packaging category
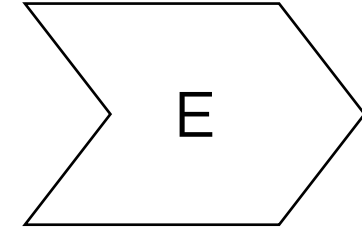
Phase E, computes the recycling by sector and packaging polymer & category, starting from input on recycling capacity by polymer.

PLASTEAX
plastic environmental analytics

powered by ea

A fully documented approach