

# Solving the Plastic Pollution Crisis Through Hotspotting

## An Introduction to the UNEP IUCN National Guidance for Plastic Pollution Hotspotting and Shaping Action

Implemented and authored by



Supported by





Mr. Feng Wang  
Ms. Ran Xie



Mr. Janaka de Silva  
Mr. Peter Manyara  
Ms. Maeve Nightingale  
Mr. Gerard Bos  
Mr. Juan Manuel Sabio Morchio



Mr. Julien Boucher  
Mr. Alexandre Bouchet  
Ms. Paola Paruta  
Ms. Violaine Magaud

# Part 1: About the Guidance

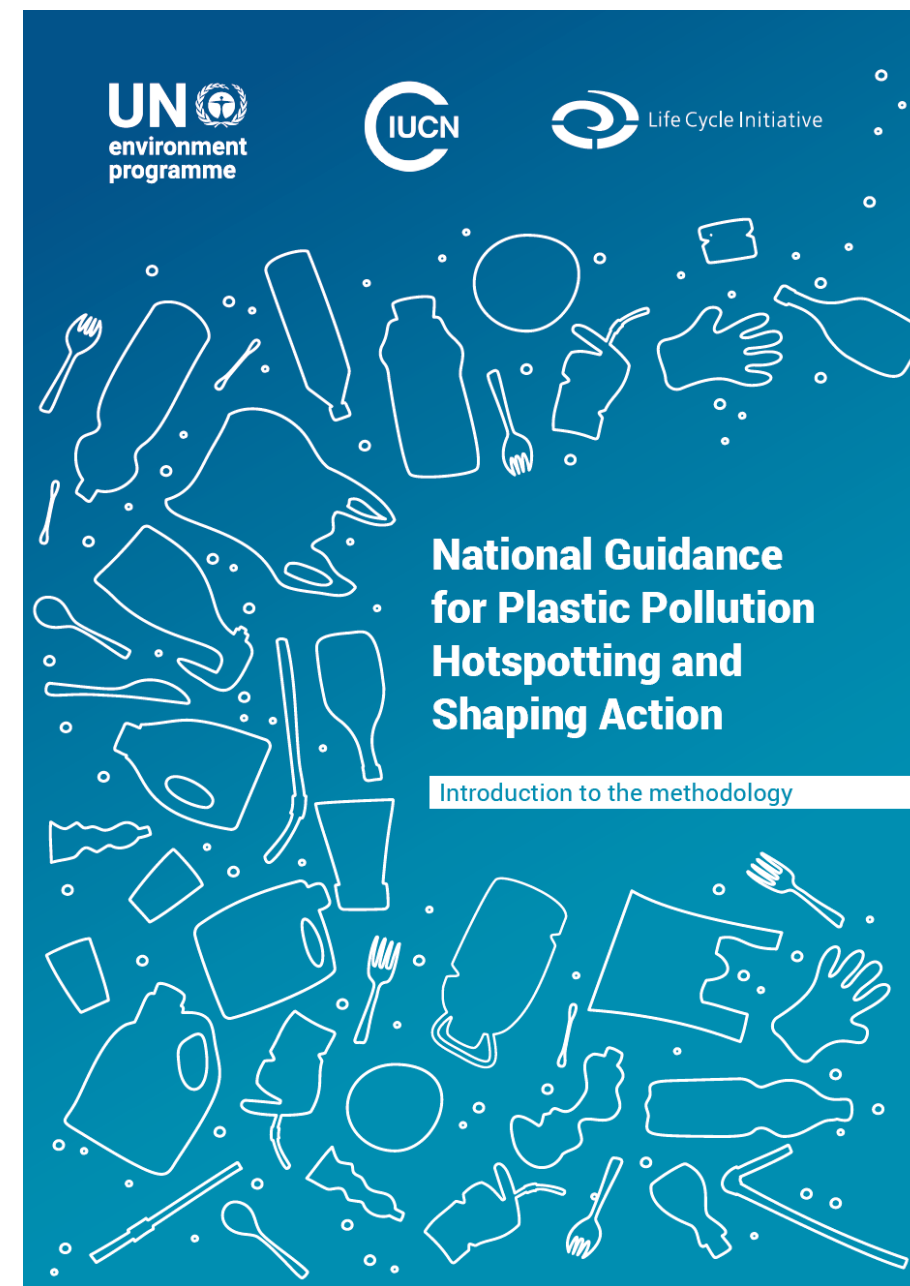
Q and A – 5 minutes

# Part 2: Sharing Results

Q and A – 5 minutes

# Part 3: Policy and Business

Q and A – 20 minutes



# About the Guidance

Presented by Mr. Feng Wang, UNEP  
Mr. Janaka de Silva, IUCN

## Why this new Guidance


Objective and high-level structure

## What you get

Examples of outputs from 18 months of piloting in 7 countries

## How to use the Guidance

An overview of the modules and tools



**National Guidance  
for Plastic Pollution  
Hotspotting and  
Shaping Action**

# Purpose of the Guidance

**A methodological framework and guidance for countries to:**



**WHERE TO ACT?**

**Identify key hotspots** towards the most relevant plastic polymers, products, and pathways leaking into the environment, as well as associated impacts



**WHAT TO DO?**

Together with key stakeholders, **prioritize key interventions** relevant for the country along the plastic value chain



**HOW TO DO IT?**

Support government in **converging towards instruments** to implement the interventions



# What is inside the Guidance

## Guidance

- High-level comprehensive overview of methodology

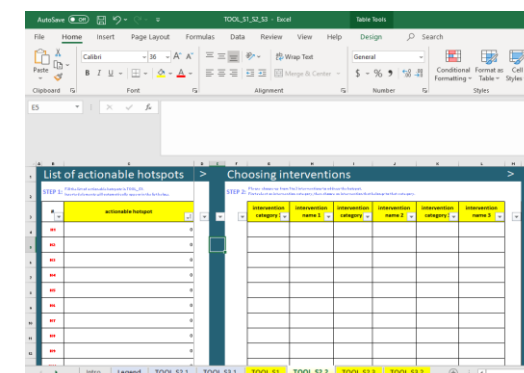
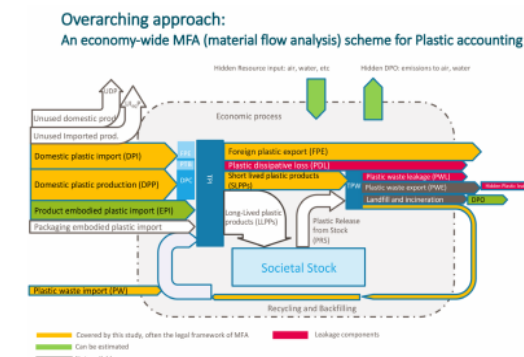
## Modules

- Detailed modelling and calculation steps and formulas

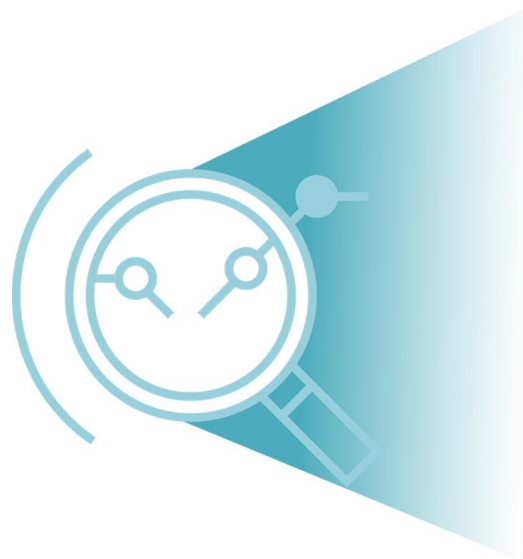
## Tools

- Spreadsheets to support data collection and analysis

<https://plastichotspotting.lifecycleinitiative.org/>



# About Hotspotting Analysis



**A hotspot** is regarded as a component of the system that directly or indirectly contributes to plastic leakage and its associated impacts, and that can be acted upon to mitigate the leakage itself.

# What we mean by plastic leakage & impacts

**A**

By plastic leakage we refer to a quantity of plastic entering rivers and the oceans

**B**

By plastic impact we refer to a potential effect the leaked plastic may have on ecosystems and/or human health





# About the Pilots



# MARPLASTICCs Approach



## Capacity Development

- 5 small-scale projects, focused on promoting circular economy strategies to reduce plastic leakage into the ocean supported
- National Hotspotting workshops in 5 countries conducted

## Business

- Plastic Leak Project (PLP) methodological guidelines mainstreamed nationally
- Mapping on business commitments and initiatives completed.

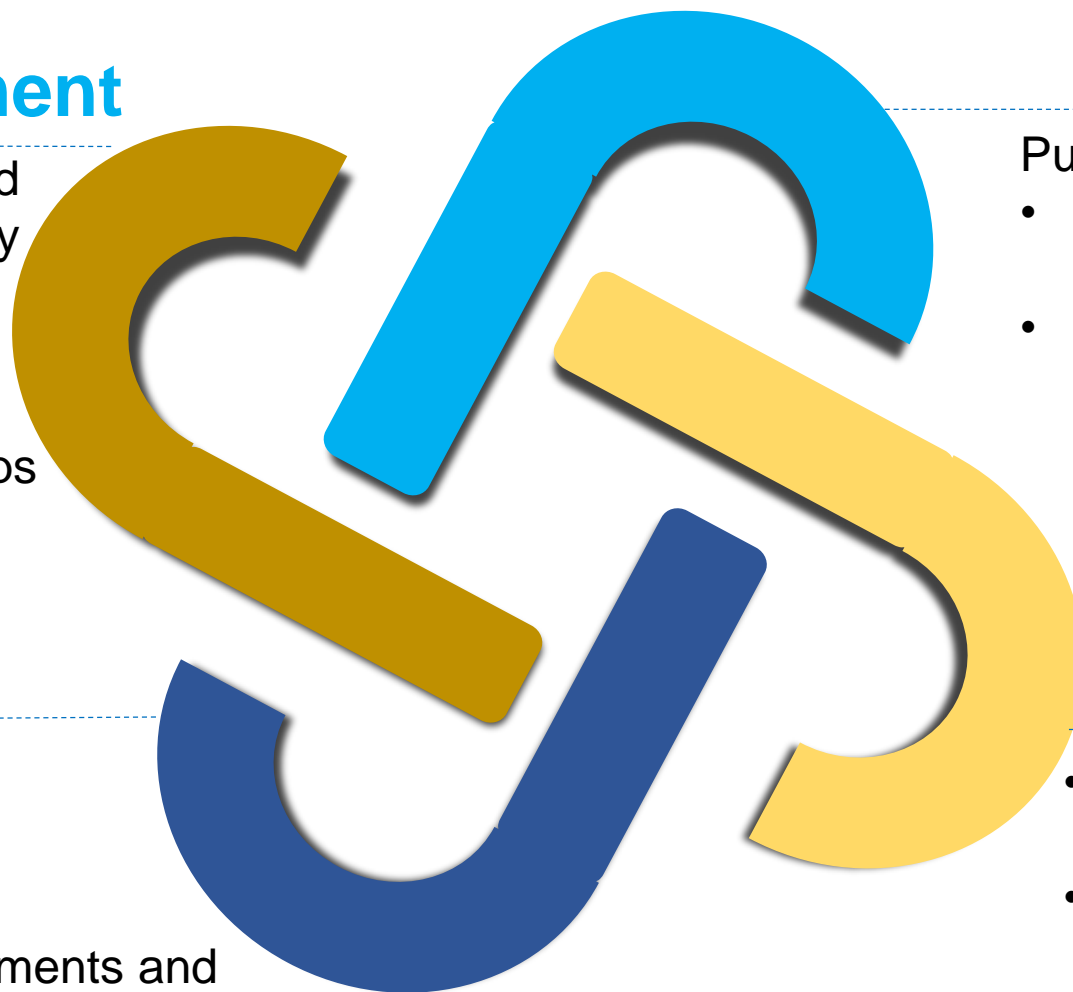
## Knowledge

### Publications:

- *Review of Plastic Footprint Methodologies*
- *UNEP-IUCN National Guidance for Plastic Pollution Hotspotting and Shaping Action*

## Policy

- 5 national policy inventories completed
- Initial review by national stakeholders completed
- Priorities for recommendations identified



# Outputs from the Guidance

Presented by Mr. Julien Boucher, EA

## Why a new guidance

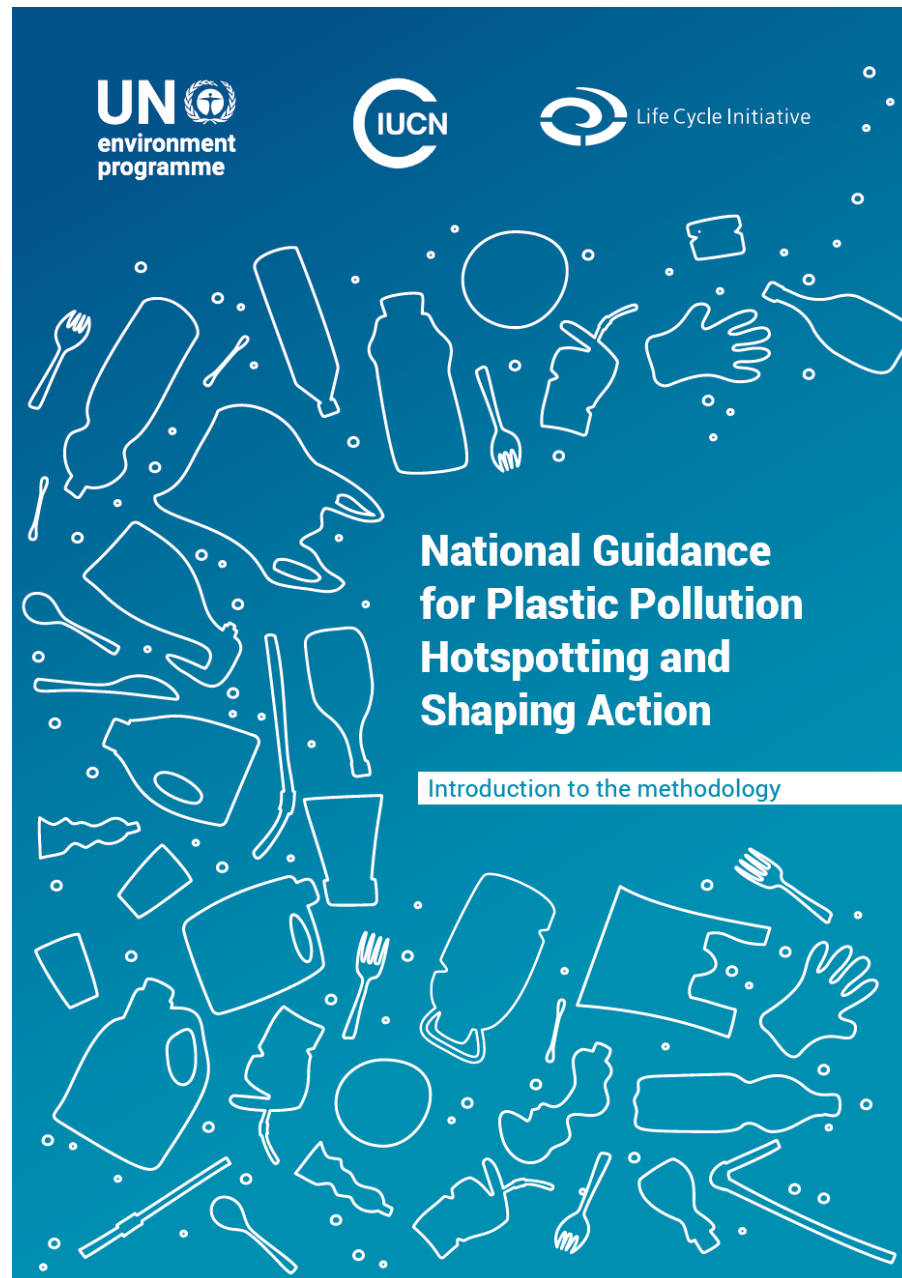
Objective and high-level structure of the guidance

## What you get

Examples of outputs from 18 months piloting in 7 countries

## How to use the guidance

An overview of the modules and tools



# The Country Baseline (1/3)

Generating a coherent picture  
through mass balance &  
data reconciliation

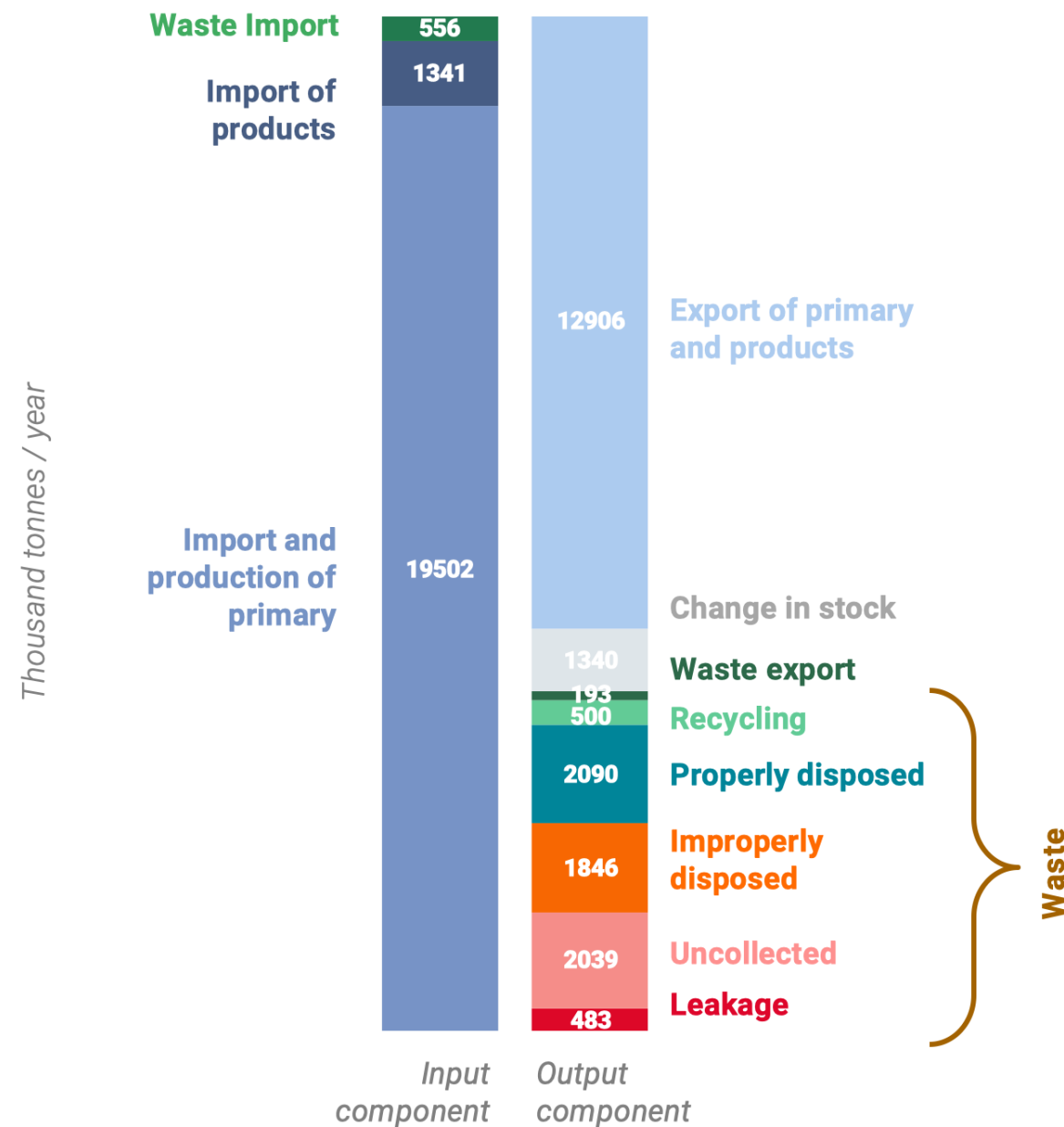
Quantification of main plastic flows  
and waste management  
performance

Standardized approach  
to benchmark countries,  
polymers, applications and sectors

Part 1

Part 2

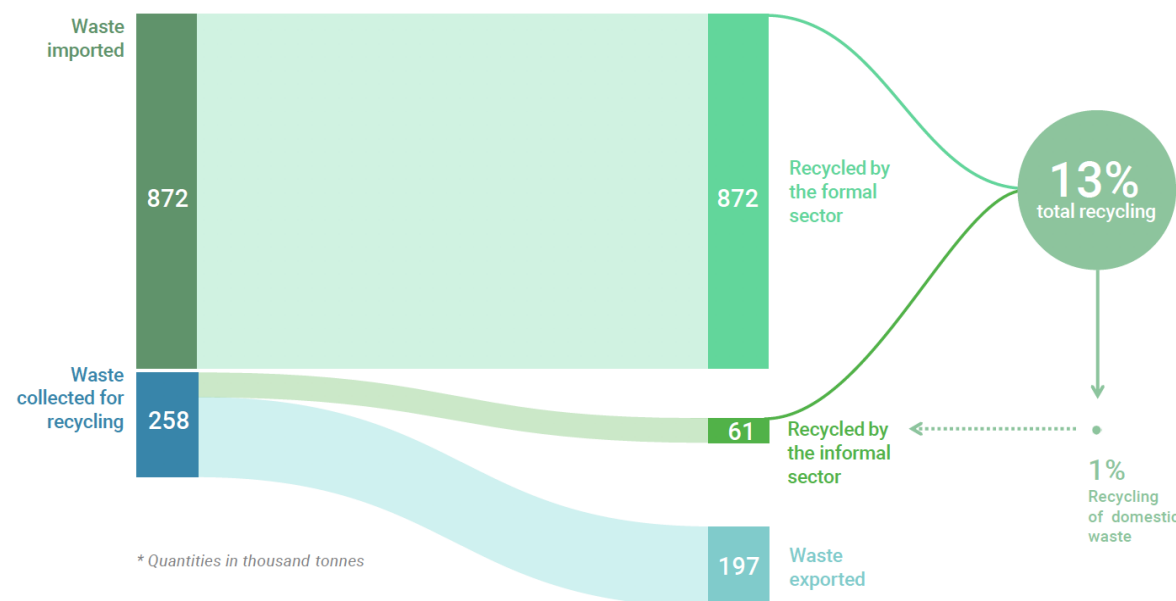
Part 3



# The Country Baseline (2/3)

Understanding the plastic recycling situation in the country, including imports and exports as well as formal and informal sectors

## RECYCLING: ROLE OF FORMAL AND INFORMAL SECTORS



### Key take-aways

- Only 1% of the domestically generated waste is recycled.



### Learnings

In 2018, Vietnam recycles 933 kt of plastic waste (13% of total plastic waste), but most of it (872 kt) comes from imported waste, which is then recycled by the formal sector. Only the remaining 61 kt of recycled waste come from domestically generated waste and is recycled by the informal sector. Consequently, only 1% to the domestically generated waste is recycled.



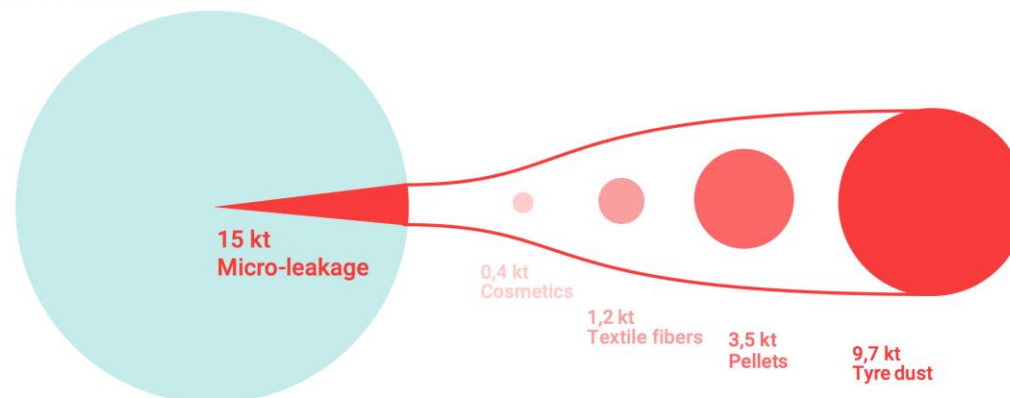
# The Country Baseline (3/3)

Including macro-plastic  
and micro-plastic  
leakage modelling

## MACRO-LEAKAGE VS MICRO-LEAKAGE [2018]



412,3 kt  
Macro-leakage



\* The methodology used to calculate micro-plastics leakage is based on the Plastic Leak Project (2019)



More details  
available in  
Appendices



### Key take-aways

- Macro-leakage contributes for 97% of the overall country leakage. This is common for countries where the solid waste is still largely mismanaged.



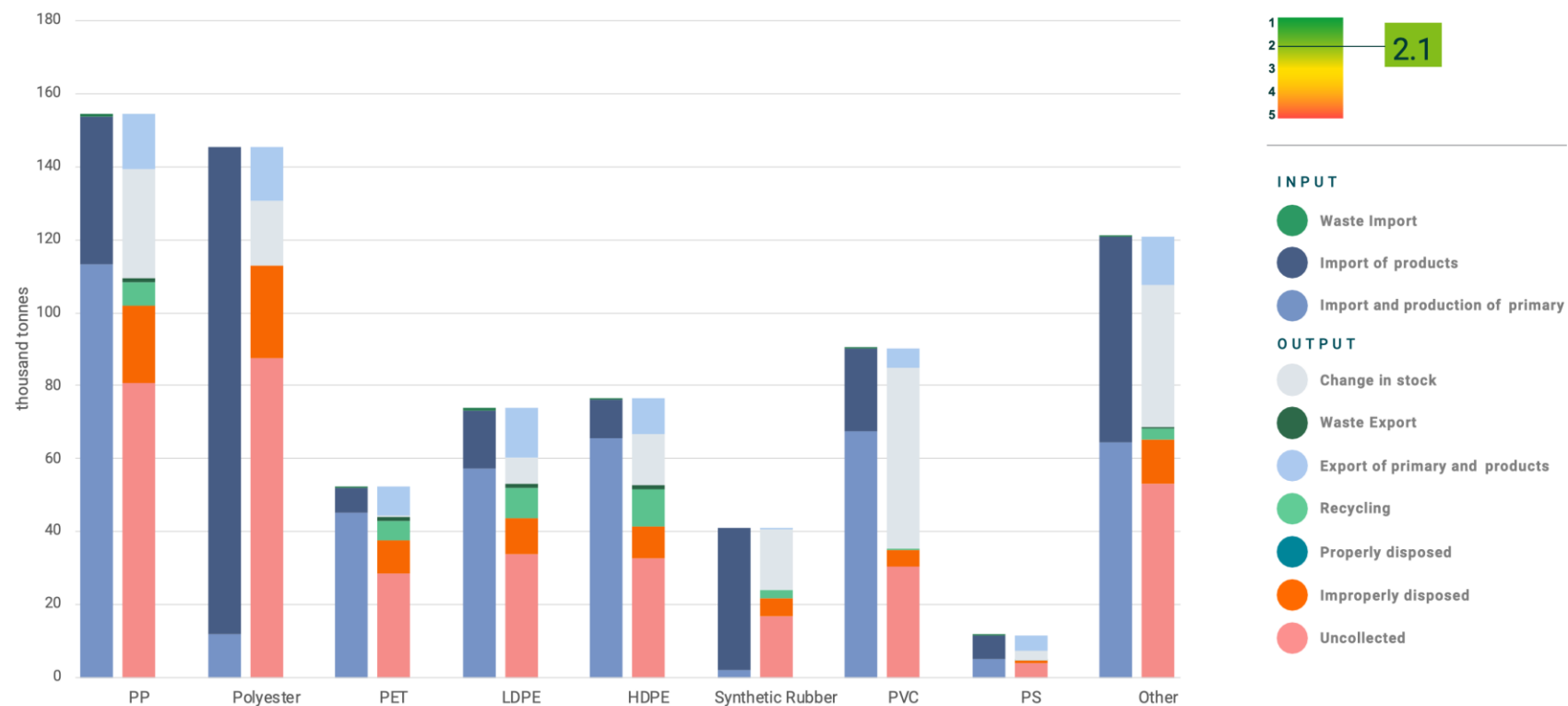
### Learnings

While tyre dust is often the first cause of plastic primary micro-leakage in a country, it is unusual though for micro-leakage of primary pellets to rank second in absolute leakage (with micro-leakage of pellets coming from losses during production and transport process). This can be explained by the fact that Thailand and is a big plastic producer and exporter: it produces 4% of the total plastic worldwide, while its population accounts for less than 1% of the world population.

# Identifying hotspots

Mass balance (per polymer/application/sector)

## MASS BALANCE BY POLYMER [2018]



# Identifying hotspots



Mass balance (per polymer/application/sector)

Waste management & Leakage modelling

Impact assessment

Priority setting to yield hotspots

Polymer	Application	Sector
PET	Bags	Automotive-tyres
LDPE	Baby diapers	Packaging
PP	Cigarette filters	Textile
Synthetic Rubber	Sanitary towels	Fishing
Polyester	Drinks bottles	Medical
PS	Other bottles	Tourism
Synthetic Rubber	Dairy packaging	Agriculture
PVC	Lids and caps	Electrical & electronics
Other	Boxes and crates	Automotive-other
	Fishing nets	Construction

 3 highest leakage contributors in absolute OR relative value       Highest leakage contributors in absolute AND relative value



# Identifying hotspots

Targeted and consistent information for multiple stakeholders and needs

Coupling the polymer / application / sector hotspots allows for data reconciling

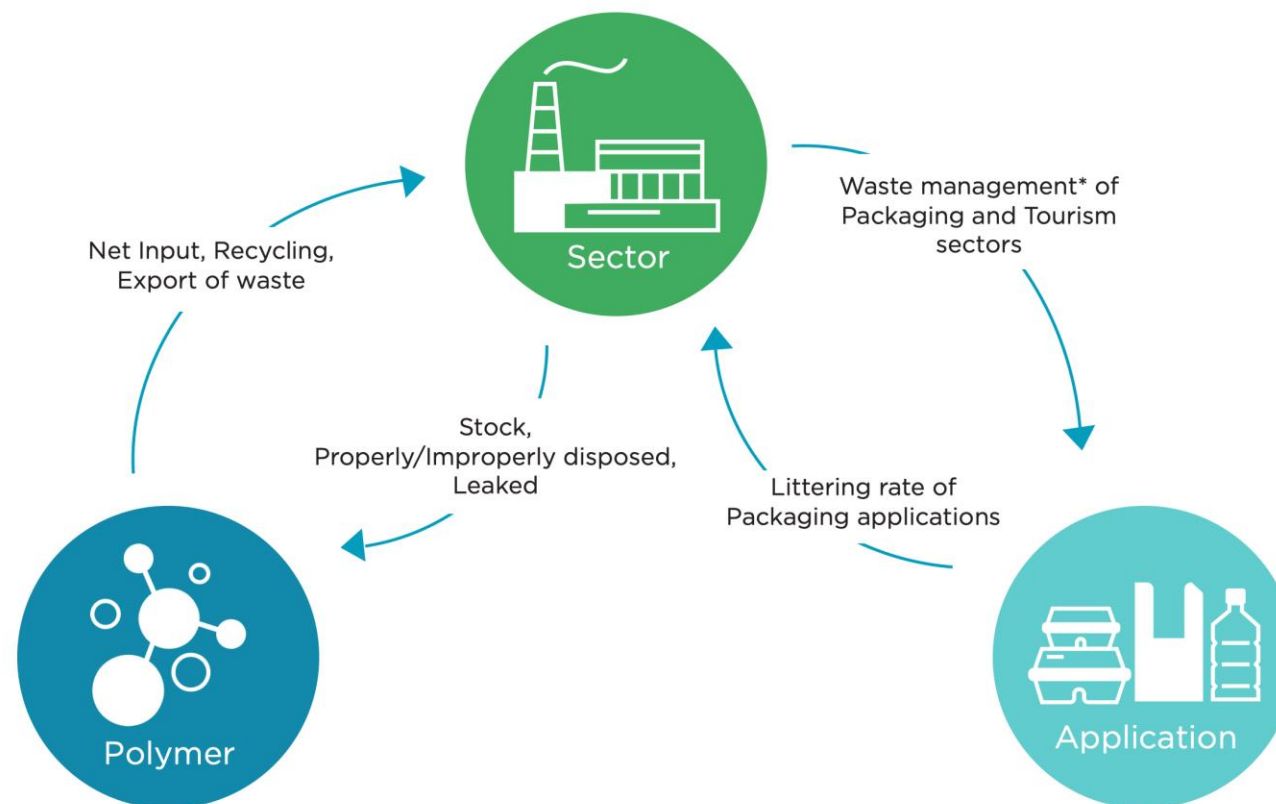


T3

Modelling Polymer/Application/Sector hotspots

13

## RECONCILING Sector, Polymer and Application MFAs



\*Waste management includes: Export of waste, Recycling, Properly/Improperly disposed, Uncollected and Leaked

# Regionalized approach

Granularity of the process can be high if data-collection allows

Leakage hotspots identified within the country and definition of regional archetypes for shaping action

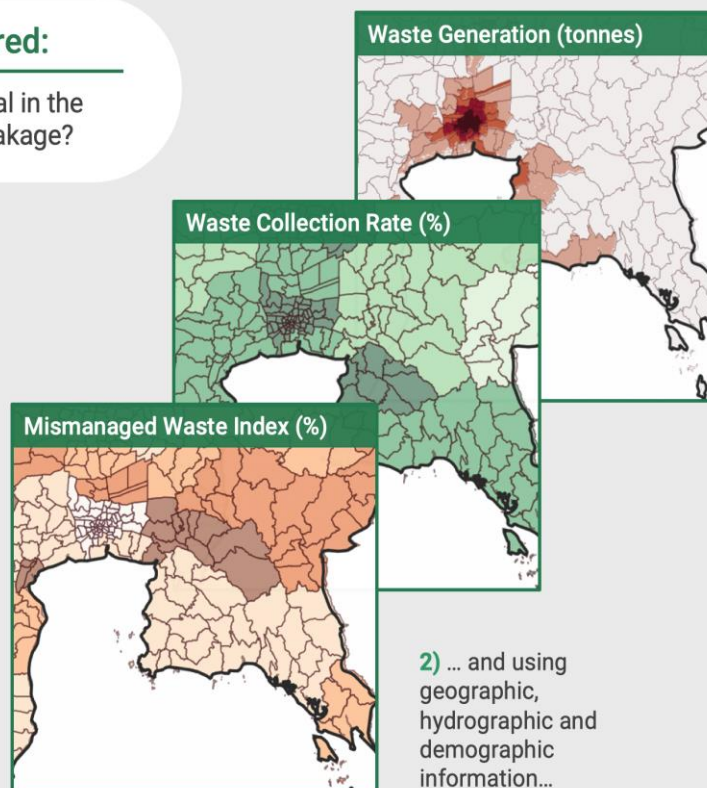
## OBJECTIVE AND INSTRUCTIONS



### Key questions answered:

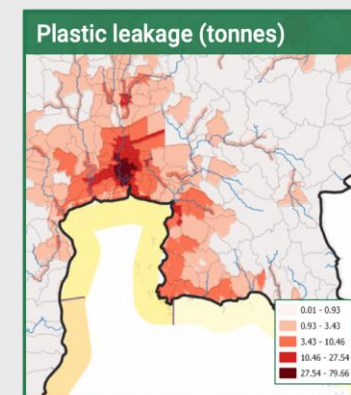
Which areas are most critical in the country regarding plastic leakage?

1) Overlaying different information available at city / district / sub-district level and/of modelled through archetypes...



2) ... and using geographic, hydrographic and demographic information...

3) ... allows to compute a leakage map and identify regional hotspots



# Waste management focus

Identification of drivers and preventers to the leakage

Archetype analysis

## WASTE MANAGEMENT HOTSPOTS

SOURCE	WASTE GENERATION	Plastic waste import	Plastic waste export	Plastic waste per capita generation	Share of plastic in waste stream
	WASTE SEGREGATION	Segregation of compostable waste	Segregation of recyclable plastics	Segregation by the informal sector	Public infrastructure availability
COLLECTION	WASTE COLLECTION	Formal collection of municipal waste	Formal collection of industrial waste	Value of recycled plastics	Value of non-recycled plastics
	LEAKAGE WHILE WAITING FOR COLLECTION	Design of waste bins	Frequency of collection	Climatic conditions	Other (e.g. animals)
	WASTE RELATED BEHAVIOURS	Littering driven by cultural habits	Littering due to a lack of public waste bins	Frequency of fly-tipping	Frequency of illegal burning
END-OF-LIFE	WASTE MANAGEMENT INFRASTRUCTURE	Share of waste in dumpsites	Share of waste in landfills	Informal recycling	Recycling capacity
	POST-LEAKAGE MANAGEMENT	Frequency of city cleaning and sweeping	Frequency of waterway cleaning	Frequency of coastal clean-up	Frequency of other clean-up activities
	WASTE WATER MANAGEMENT	Management of run-off waters	Waste water collection	Waste water treatment efficiency	Fate of WWTP sludges

- Negative contribution to the leakage
- Neutral contribution
- Positive contribution
- Not assessed



### Key take-aways

- More plastic waste was imported in 2018 than what could be recycled in the country.
- The per capita waste generation in Thailand is more than double the world average.
- Plastic accounts for 20 to 30% of all generated waste.
- The informal sector plays a key role in collecting and segregating plastic for recycling.
- Sanitary landfill and incinerator capacity cover only a third of the country waste generation.
- Open burning is a rampant practice in rural areas.
- Flooding events are recurrent in Thailand and induces to significant leakage



# Actionable hotspot formulation

Streamlined information  
for decision makers

**WHAT**  
is leaking and/or  
causing impacts?

**WHERE**  
is it leaking?

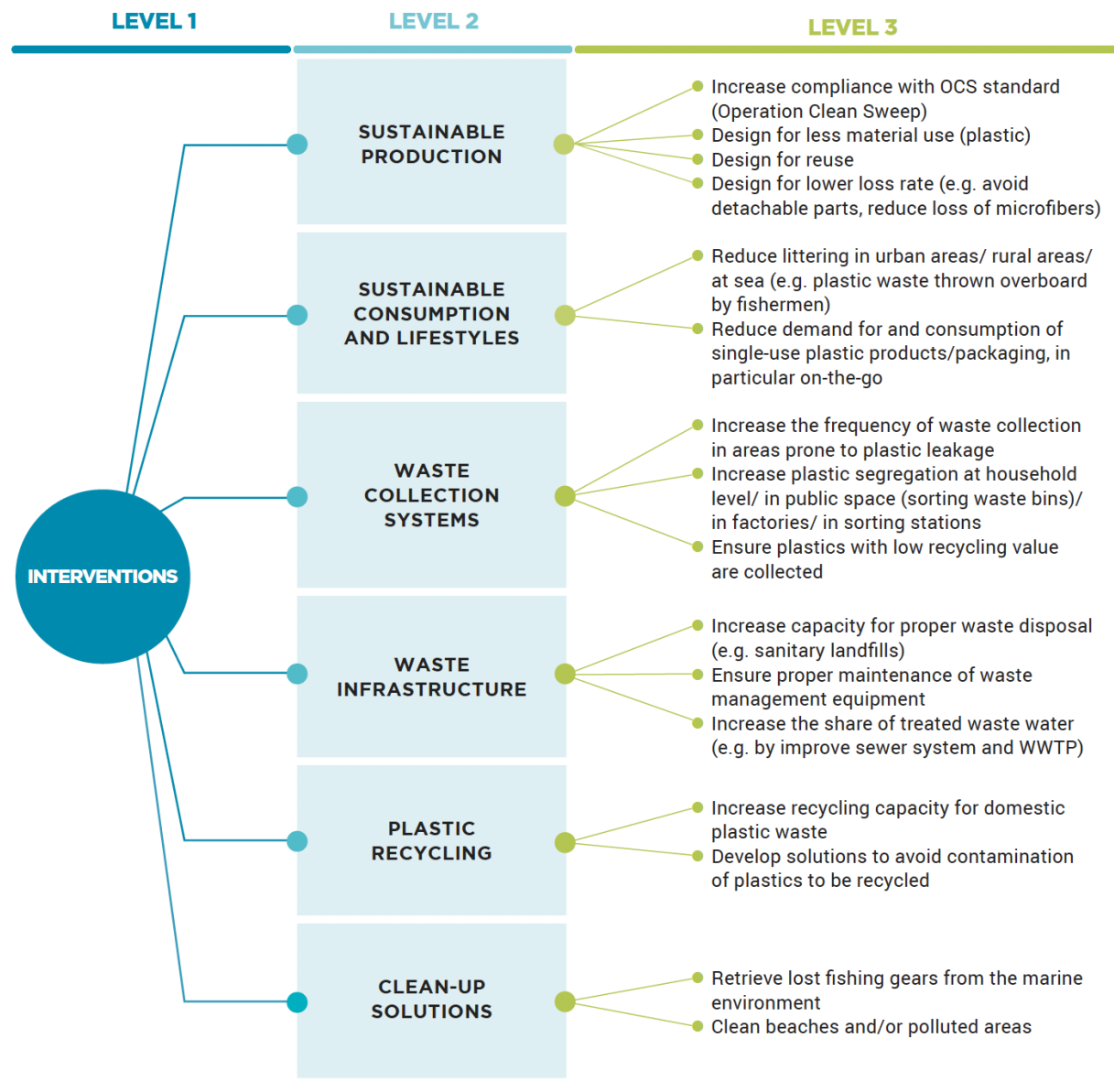
Small plastic items of all sorts  
are littered in the whole country  
due to cultural behaviours  
and the lack of garbage bins

**WHY**  
is it leaking?

# Interventions & instruments

Library of interventions / instruments by category

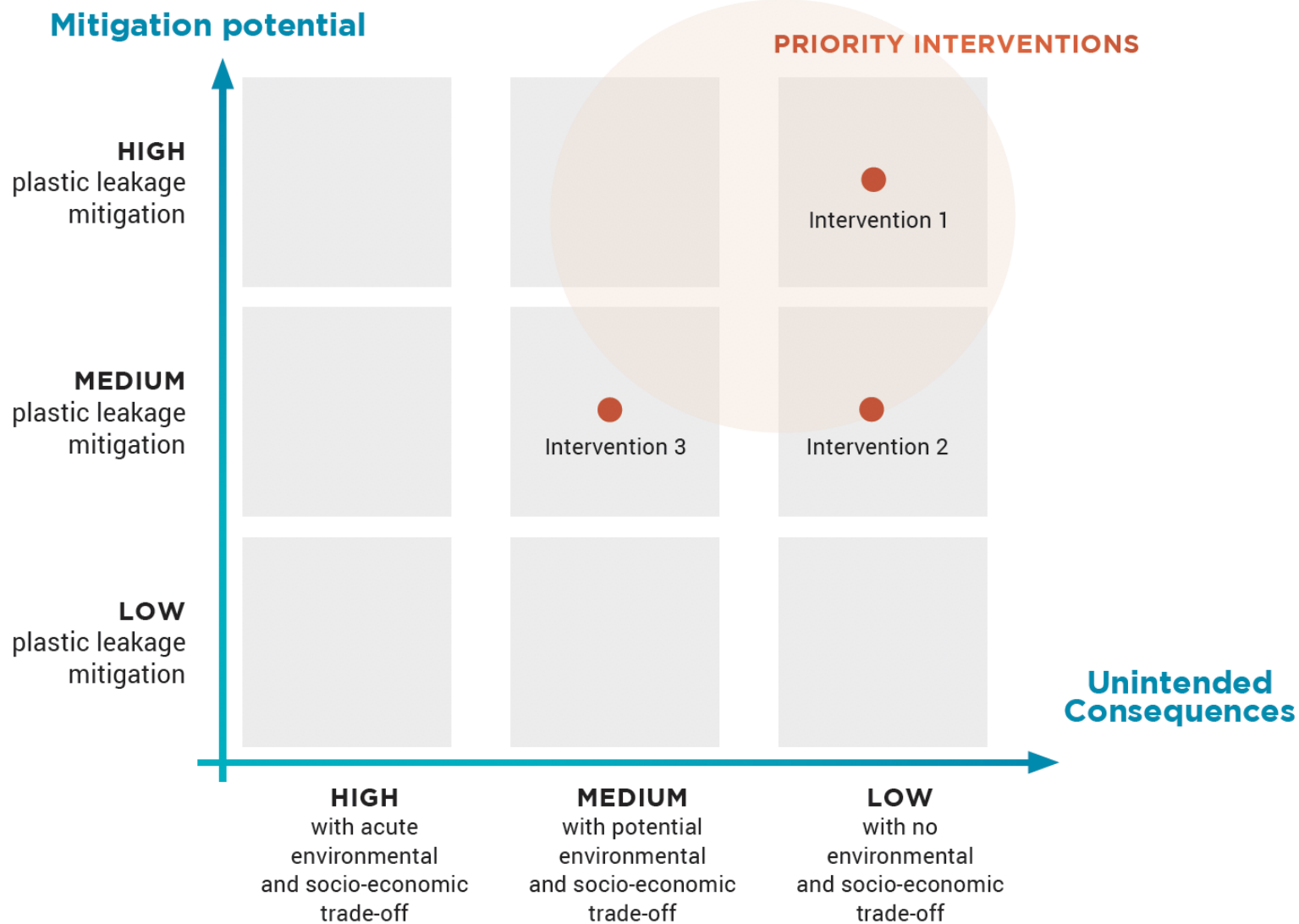
A framework for engaging stakeholder discussion





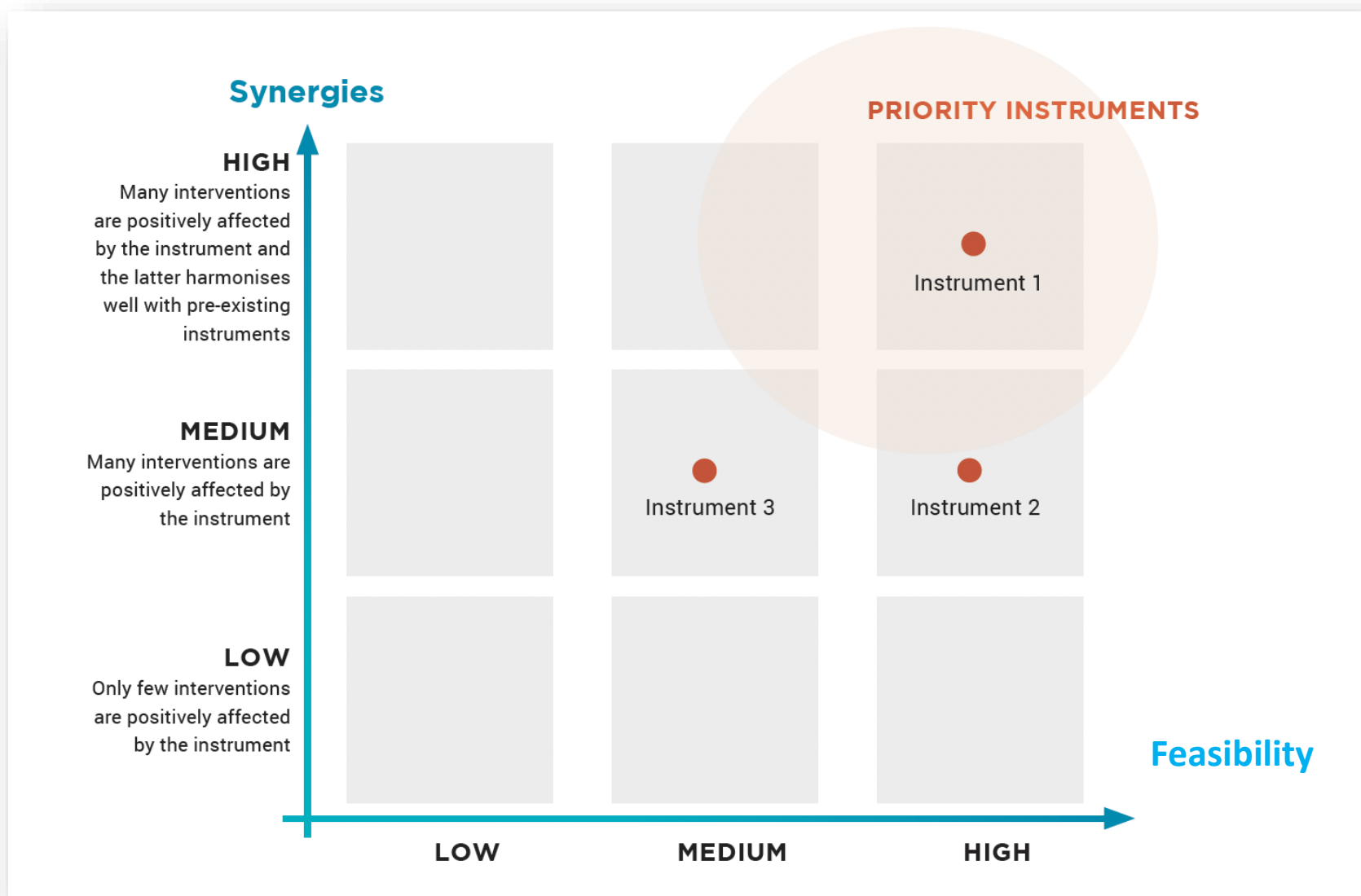
# Interventions

A prioritization scheme based on "Mitigation potential" and "Unintended consequences"



# Instruments

A prioritization scheme based on "Synergies" and "Feasibility"



# Data Repository

A coherent dataset for key plastic management metrics in the country

More robust and granular leakage calculation

Key information to funnel public and private investments toward the most appropriate infrastructures and projects

The basis for monitoring progress

## DETAILED SHARES BY POLYMER

Polymer Type	Waste produced in country kt	Domestic recycling of collected	Export of collected	Properly disposed	Improperly disposed	Uncollected	Tot	Collected	Mismanaged	Leaked	Waste produced and imported	Domestic recycling incl imported
PET	485	37%	19%	17%	15%	13%	100%	87%	28%	4%	598	34%
PP	359	22%	11%	20%	20%	26%	100%	74%	47%	5%	404	22%
Polyester	2690	0%	0%	33%	32%	35%	100%	65%	67%	5%	2690	0%
LDPE	1355	0%	0%	31%	31%	38%	100%	62%	68%	9%	1598	0%
HDPE	708	14%	7%	22%	22%	34%	100%	66%	56%	7%	832	14%
PS	64	11%	6%	19%	20%	44%	100%	56%	64%	6%	72	11%
Other	432	0%	0%	27%	29%	44%	100%	56%	73%	6%	439	0%
Synthetic Rubber	289	6%	0%	29%	28%	37%	100%	63%	65%	7%	289	6%
PVC	216	25%	1%	9%	11%	53%	100%	47%	65%	3%	230	26%
All	6596	7%	3%	32%	32%	35%	100%	65%	66%	6%	7152	7%

- **Waste** = Collected + Uncollected
- **Collected** = Domestic recycling of collected + Export of collected + Properly managed + Improperly managed
- **Mismanaged** = Improperly managed + Uncollected



# How to Use the Guidance

Presented by Mr. Alexandre Bouchet, EA

## Why a new guidance

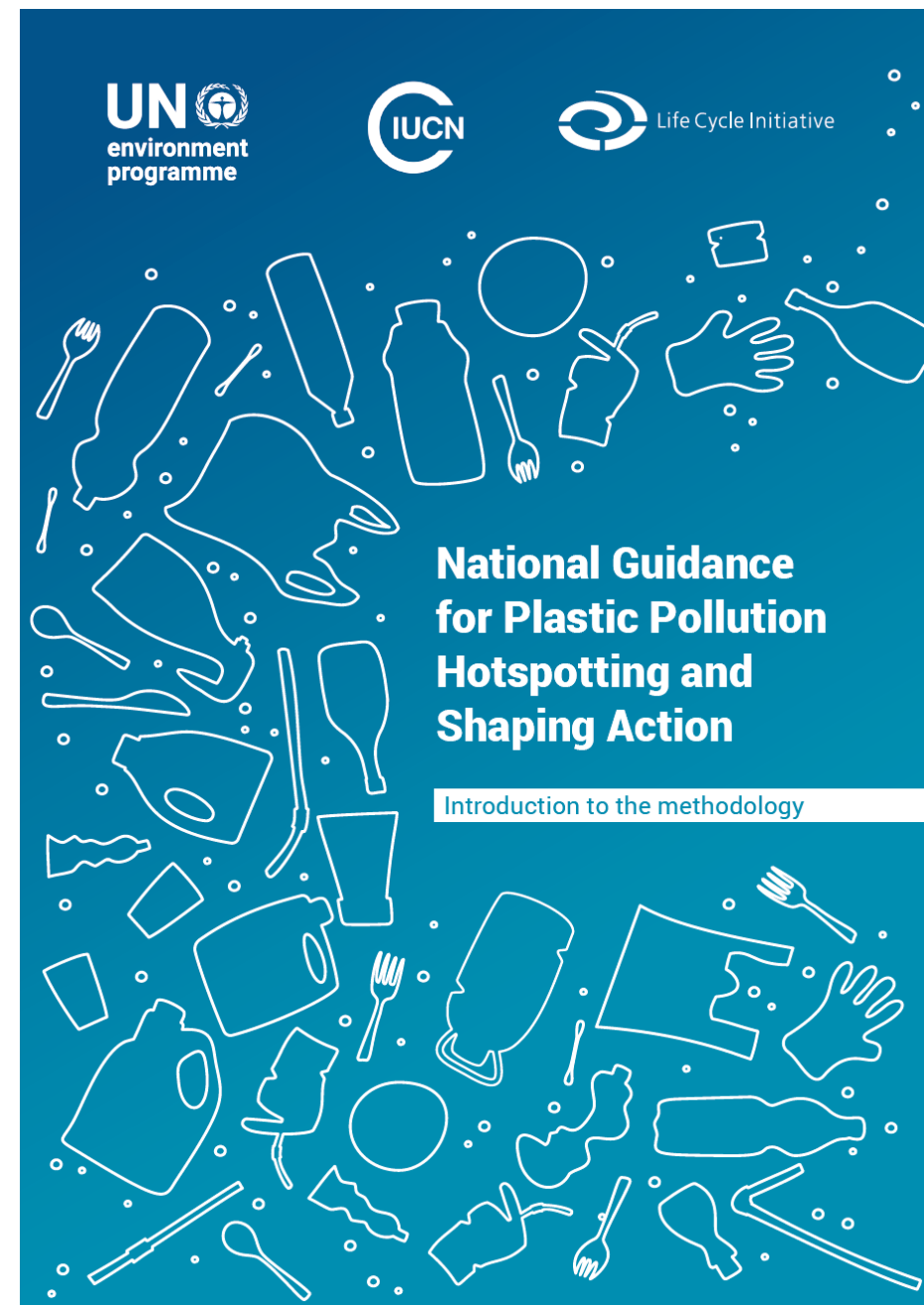
Objective and high-level structure of the guidance

## What you get

Example of outputs from our 18 months piloting

## How to use the guidance

An overview of the modules and tools

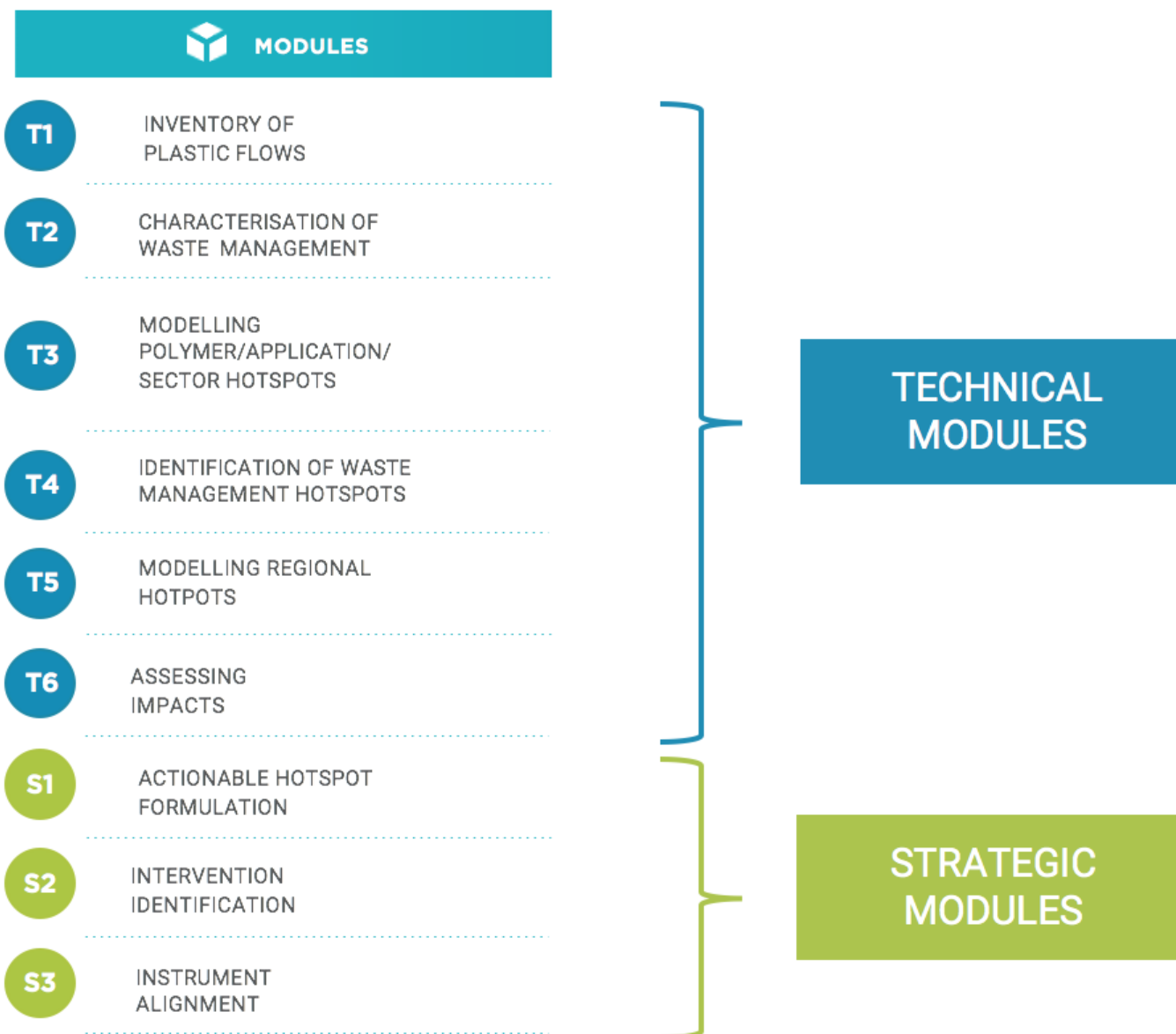


# Modules & Tools

Technical and  
Strategic modules

Input, assessment &  
output tools

20+ tools  
spanning across  
9 modules

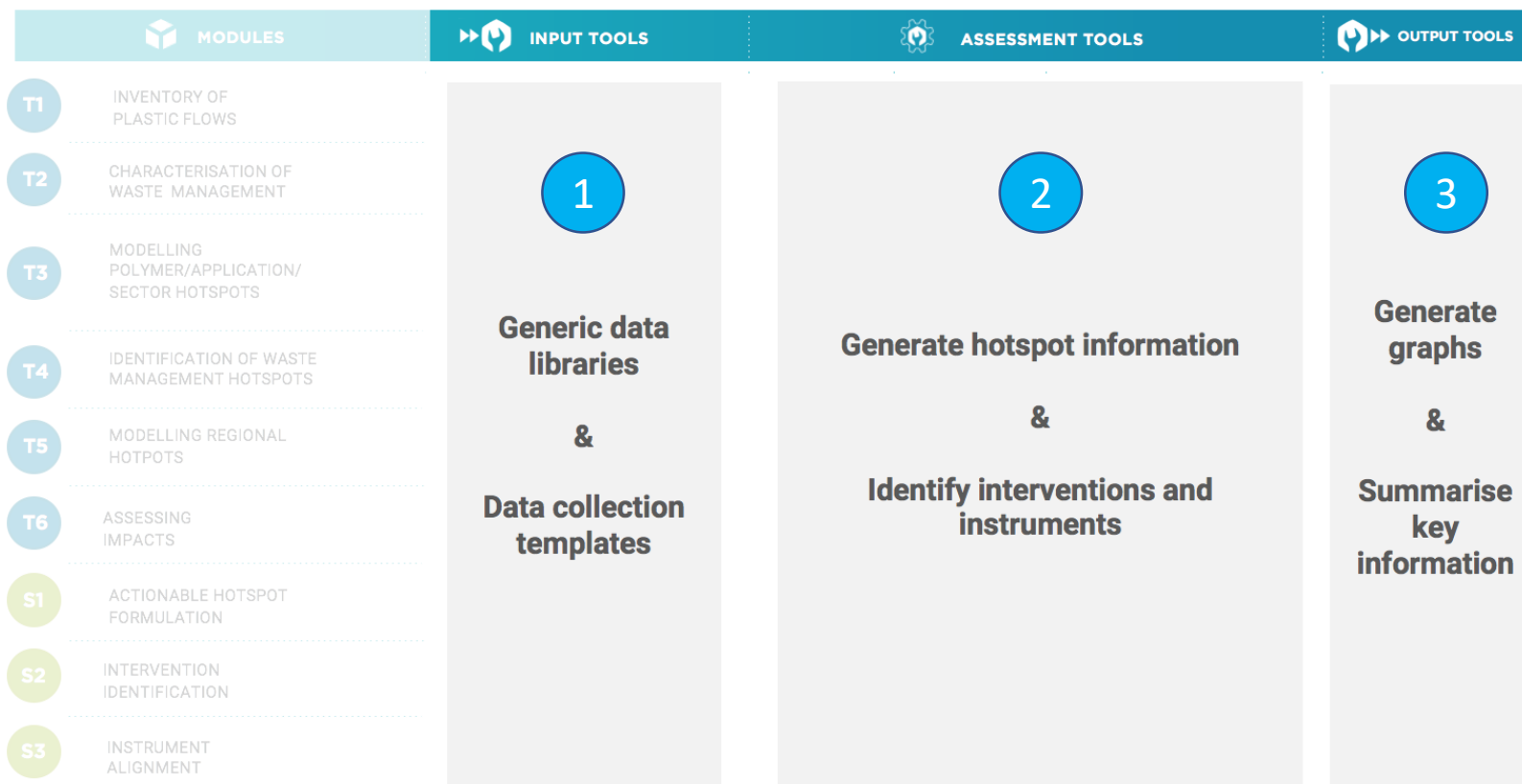


# Modules & Tools

Technical and  
Strategic modules

Input, assessment &  
output tools

20+ tools  
spanning across  
9 modules

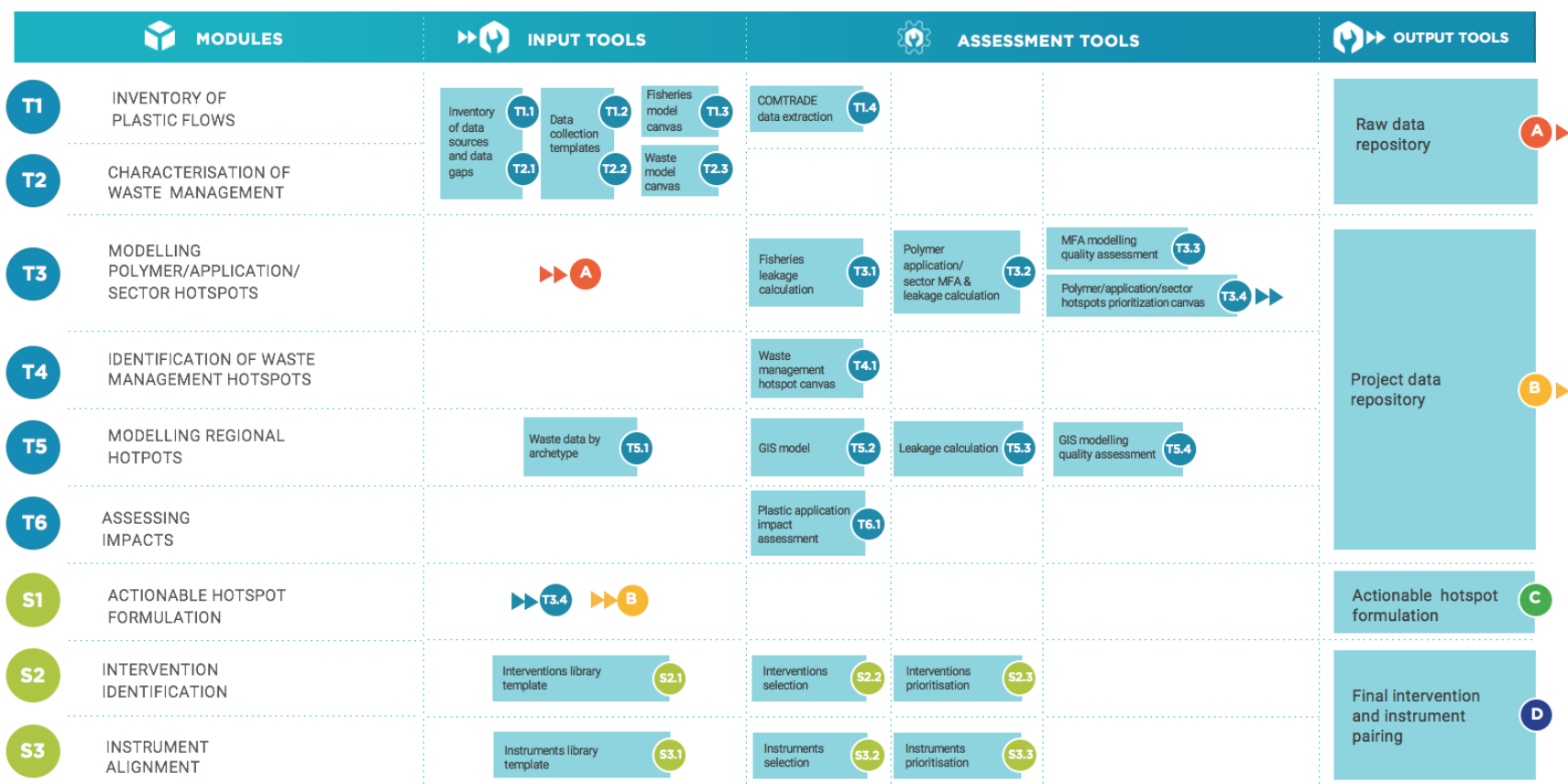


# Modules & Tools

Technical and  
Strategic modules

Input, assessment &  
output tools

20+ tools  
spanning across  
9 modules



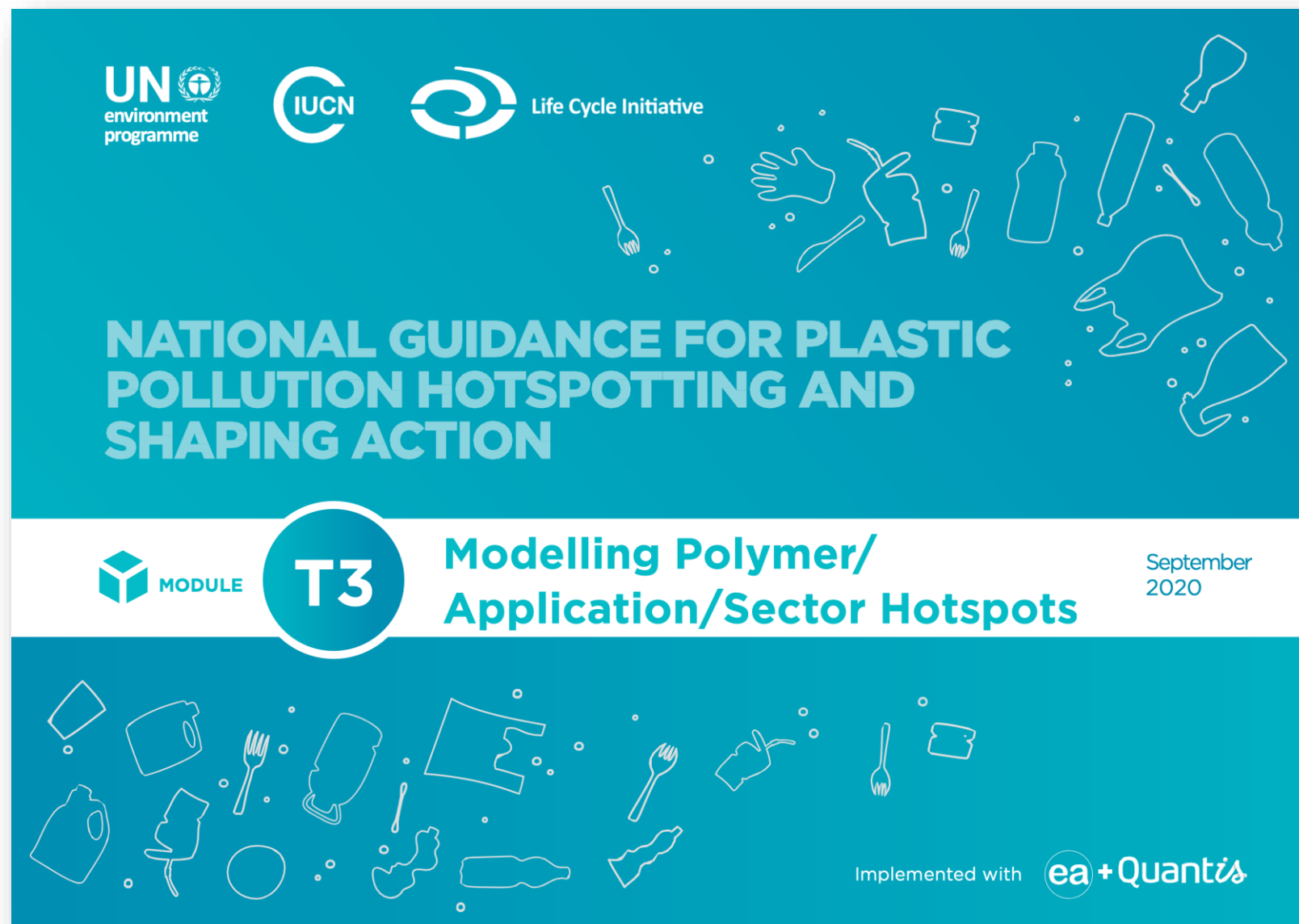
# Example of a module

A fully guided approach

Description of the workflow

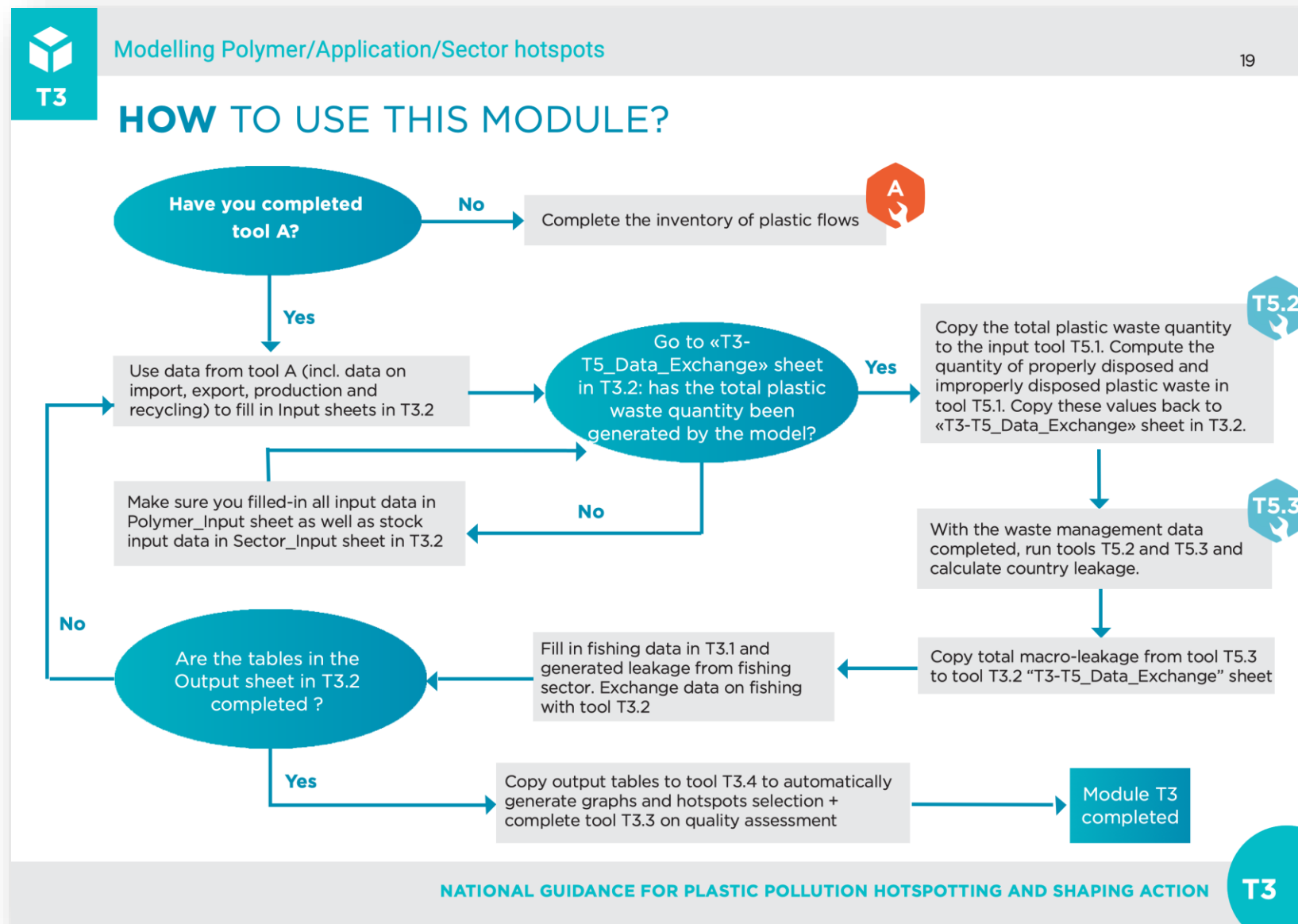
Detailed instructions to run the tools

Contextual information and references



# A guidance mindset

A clear step by step workflow through logical diagrams



# Example of tools

Each module includes one or several tools (Excel sheets, templates of GIS files)



T3

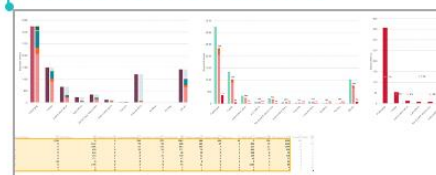
Modelling Polymer/Application/Sector hotspots

9

## EXCEL TOOLS ASSOCIATED WITH THIS MODULE

T3.4

POLYMER/  
APPLICATION/SECTOR  
HOTSPOTS  
PRIORITISATION CANVAS



Polymer	Sector	Application
LDPE	Packaging	Bags
PE1	Textile	Boxes, cases, crates
PP	Automotive-other	Uls and caps
Polyester	Agriculture	Other bottles
HDPE	Electrical & electronics	Drinks bottles
PS	Automotive-tires	Dairy packaging
PVC	Toiletries	Cigarette filters
Synthetic Rubber	Construction	Baby diapers
Other	Medical	Sanitary towels
	Fishing	Fishing nets
	Others	Other packaging

TYPE:  
**ASSESSMENT TOOL**



OBJECTIVE:

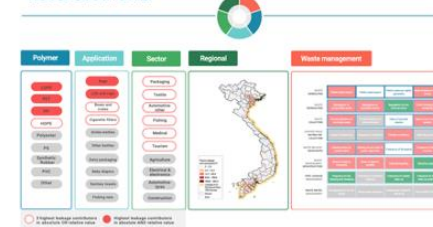
Given MFA tables from T3.2 as input, it generates MFA and Leakage graphs for Polymer, Application and Sector. It also automate the hotspots selection.

B

PROJECT DATA  
REPOSITORY



HOTSPOTS IN BRIEF



TYPE:  
**OUTPUT TOOL**



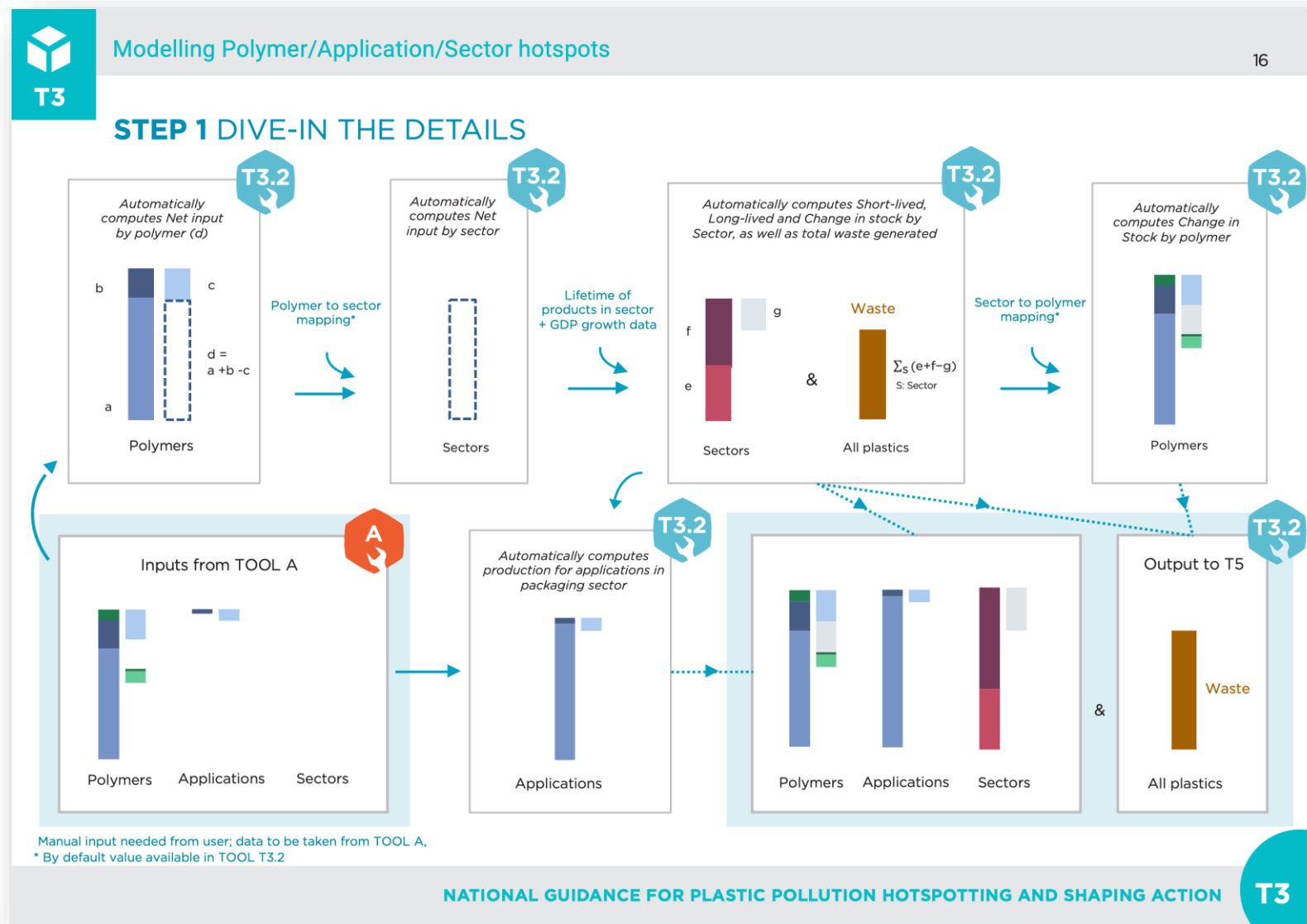
OBJECTIVE:

Canvas in PowerPoint to recap all hotspots by category.

These tools are available in the Excel and PowerPoint files associated with this module.



## In-depth explanations to understand how the model works





# Website

All tools and modules are available online at:

<https://plastichotspotting.lifecycleinitiative.org>

National Guidance for Plastic Pollution Hotspotting and Shaping Action
A common methodological framework to enable countries to prioritize interventions to abate plastic pollution

HOME
WEBINARS
MODULES
PILOTS
FAQ

### Module T1

Module T1 enables users to collect data on plastic sources in the country and results in targeted plastic flows to be considered for plastic leakage calculation. Module T1 can be run independently from other modules when only pursuing the goal of inventorying plastic inputs and outputs in the country.

T1.1

T1.2

T1.3

T1.4

TA

### Module T2

Module T2 enables to collect data on solid waste and waste water management and results in key waste management metrics to be used for leakage calculation. Module T2 can be run independently from other modules when only pursuing the goal of assessing waste and waste-water management performance in the country.

T2.1

T2.2

T2.3

TA

National Guidance for Plastic Pollution Hotspotting and Shaping Action
A common methodological framework to enable countries to prioritize interventions to abate plastic pollution

HOME
WEBINARS
MODULES
PILOTS
FAQ

### Vietnam

**VIETNAM PILOT – 2019**

Study performed in 2019 based on 2018 data. Project lead by IUCN and implemented by EA & Quantis. Full set of data available for the country for 8 polymers and all provinces.

### Thailand

**THAILAND PILOT – 2019**

Study performed in 2019 based on 2018 data. Project lead by IUCN and implemented by EA & Quantis. Full set of data available for the country for 8 polymers and all provinces.

# Sharing Results from Africa and Asia

The IUCN MARPLASTICCs project – a truly multistakeholder approach



# Results Africa - Kenya

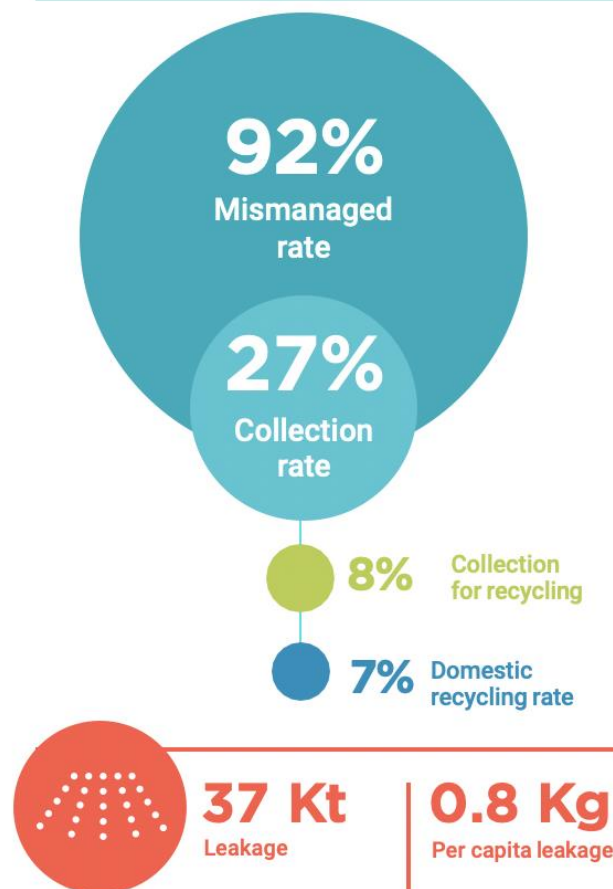
Presented by Mr. Peter Manyara

1. Overview of results
2. Learnings from the project implementation



# Kenya hotspot overview [2018]

## Global view on plastic in Kenya



## Hotspots

### Most leaking Polymers



### #hotspots per waste management stage



4  
Cities

responsible for  
35% of the waste  
mismanagement

## Shaping action from the hotspots

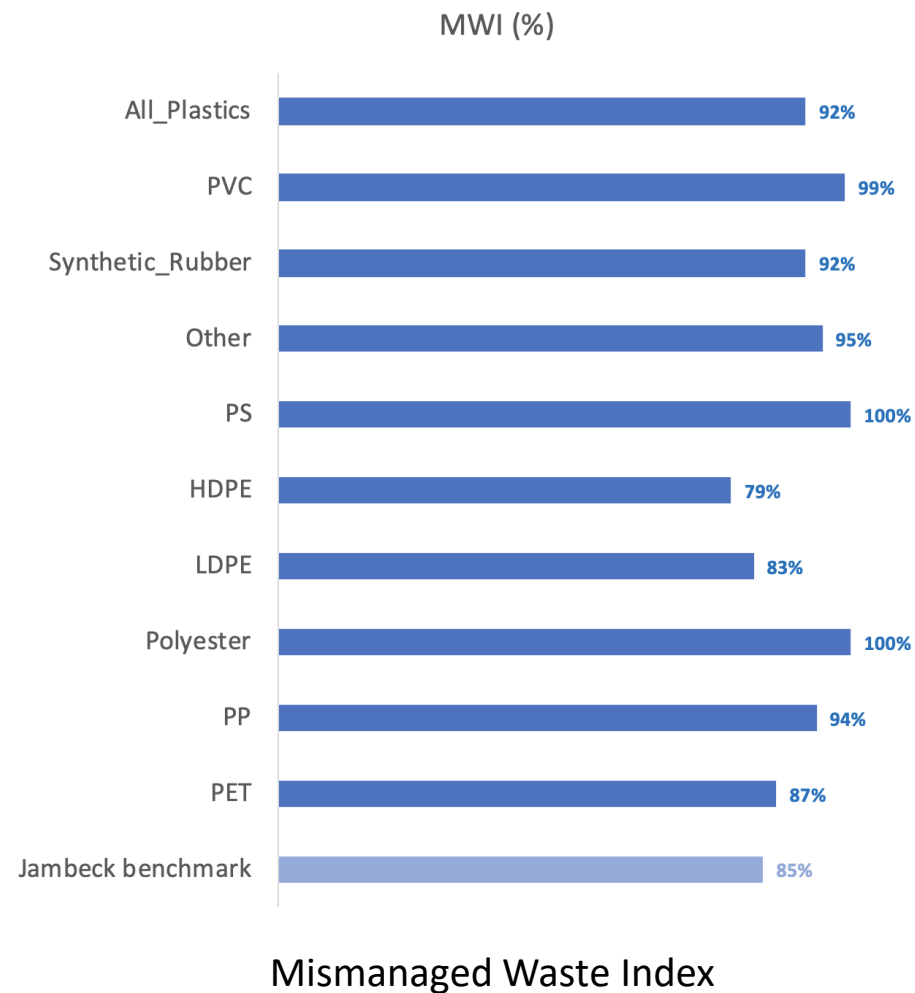
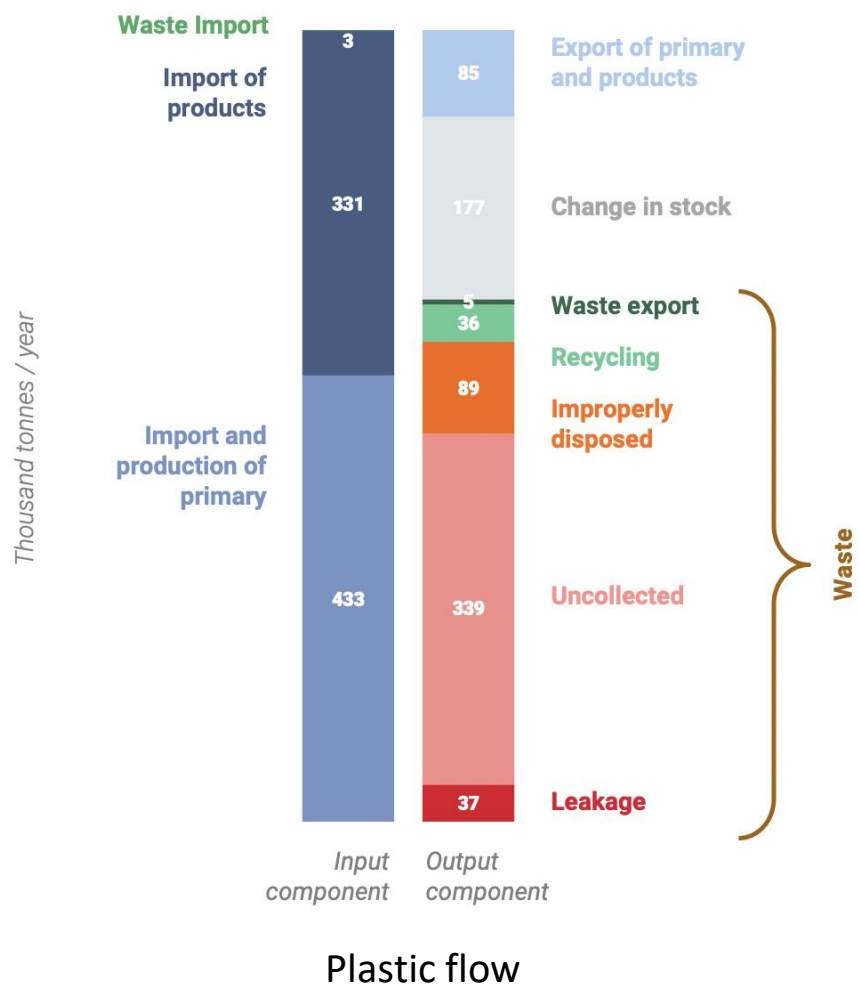


11  
Actionable  
Hotspots



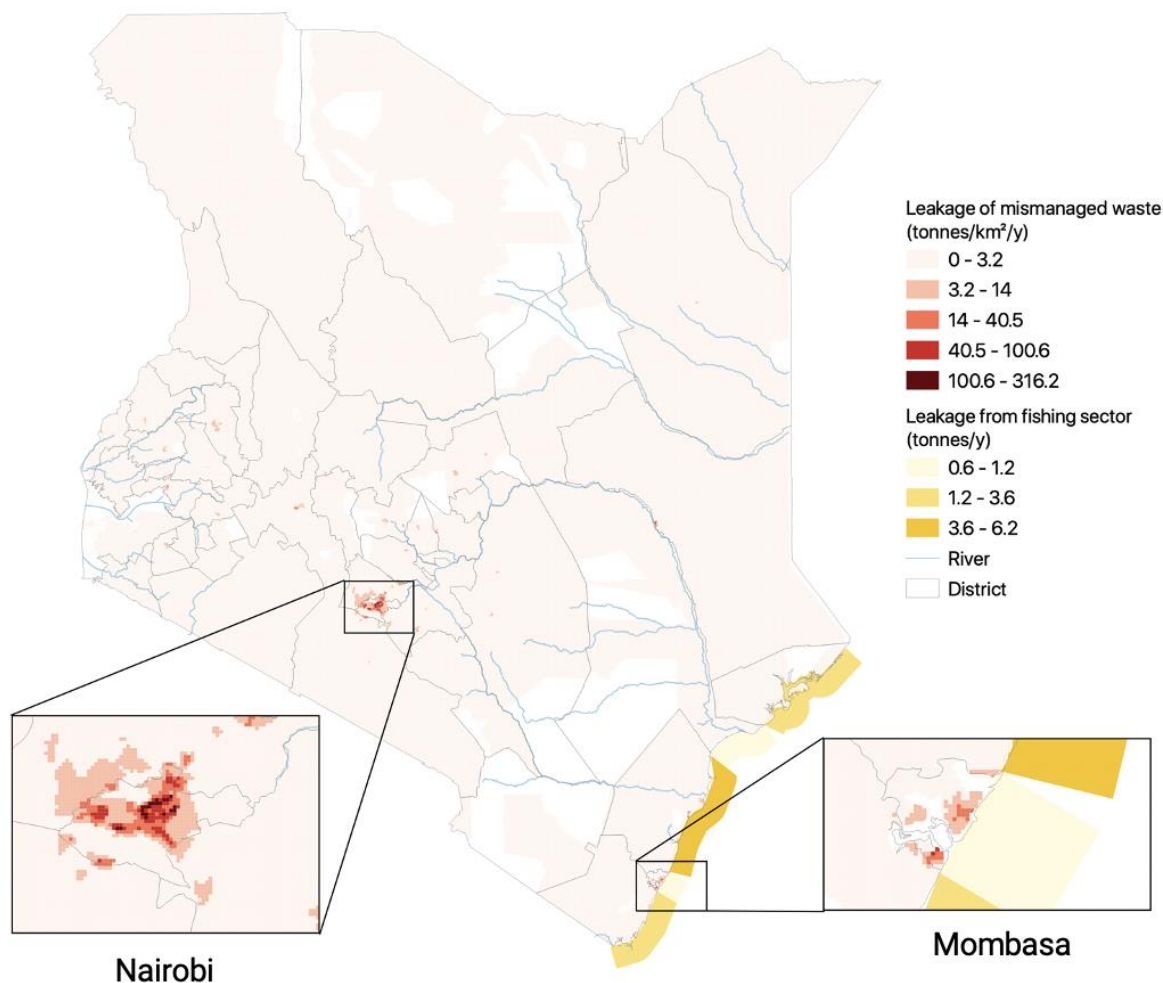
13  
Key  
Interventions

# Kenya baseline [2018]





# Kenya regional hotspots [2018]



## Key take-aways

- Annual leakage of mismanaged waste: 35'139 tonnes
- Annual leakage from mismanaged/lost at sea fishing gears and from overboard litter: 14 tonnes
- Most of the leakage comes from populous cities because of high per capita waste generations compared to rural areas.

# Results Asia - Thailand

Presented by Ms. Maeve Nightingale, IUCN

1. Overview of results
2. Learnings from the project implementation

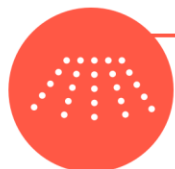


# Thailand hotspot overview [2018]

Global view on plastic in Thailand

Hotspots

Shaping action from the hotspots

**66%**Mismanaged  
rate**65%**Collection  
rate**10%** Collection  
for recycling**7%** Domestic  
recycling rate**483 Kt**

Leakage

**7 Kg**

Per capita leakage

Most leaking  
Applications

Bags

Snack  
bags/Pouches

Trays/Boxes/Cups

Baby diapers

Cigarette filters

Bottles

Caps/Cap Rings

Sanitary towels

Most leaking  
Polymers

LDPE

HDPE

Polyester

Synthetic  
Rubber

PET

PP

PS

PVC

#hotspots per waste  
management stage

● ● ● ● Waste generation

● ● ● ● Waste segregation

● ● ● ● Waste collection

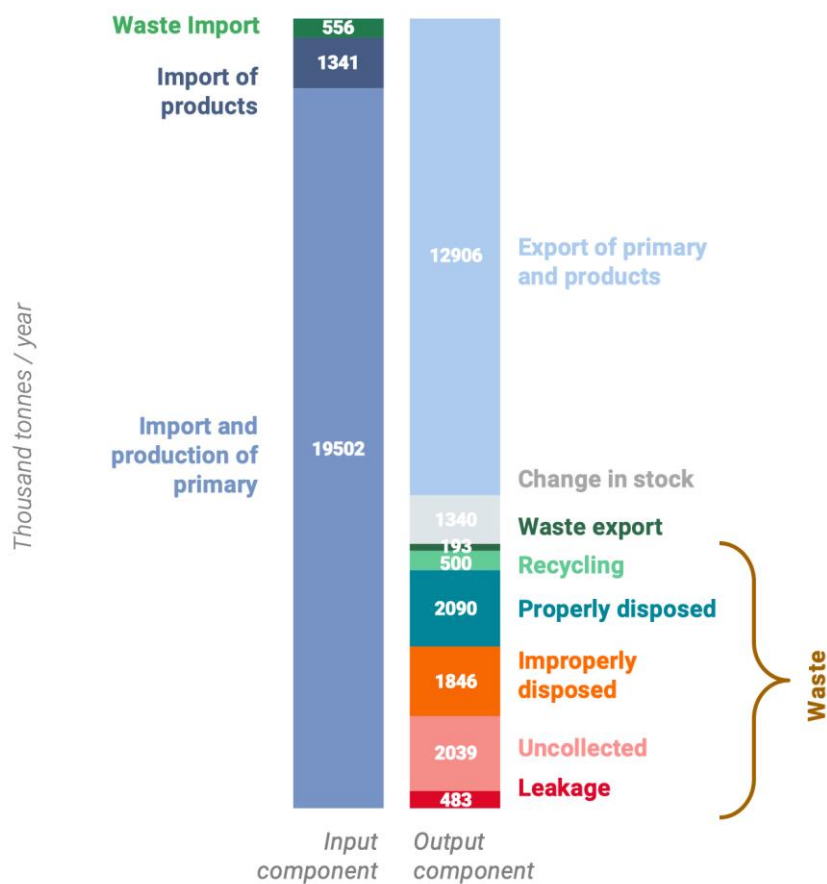
● ● ● ● Leakage while  
waiting for collection● ● ● ● Waste related  
behaviors● ● ● ● Waste management  
infrastructure**18**

Provinces

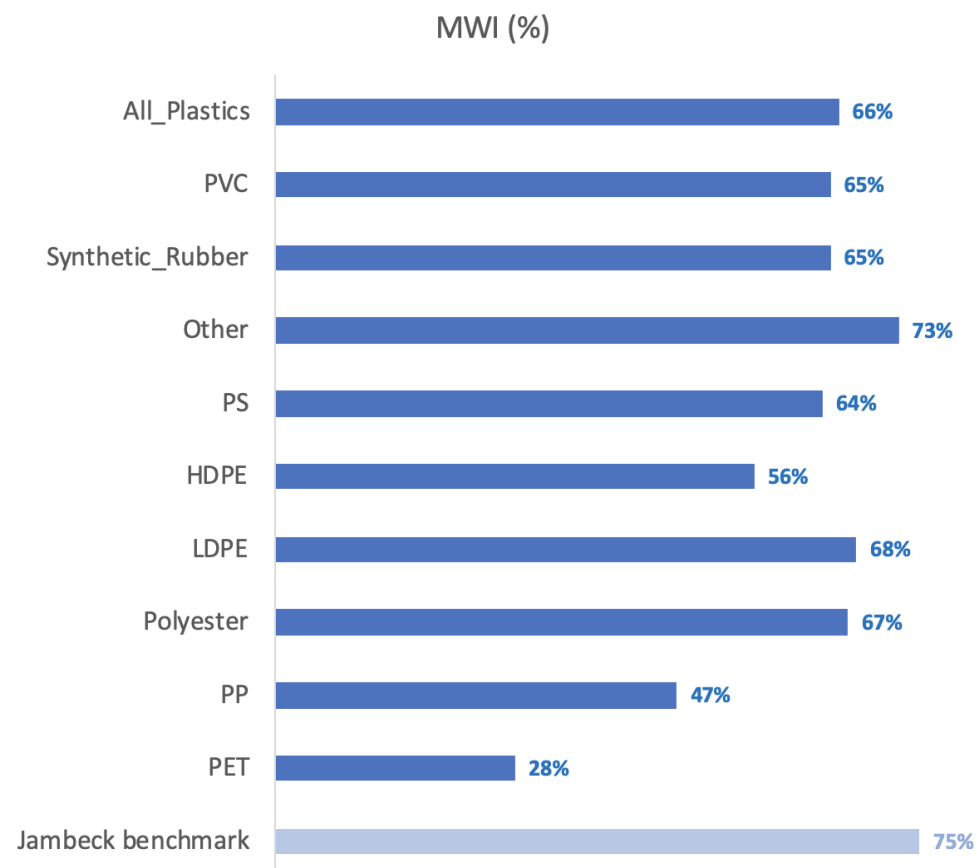
responsible for  
50% of the waste  
mismanagement**14**Actionable  
Hotspots**19**Key  
Interventions



# Thailand baseline [2018]

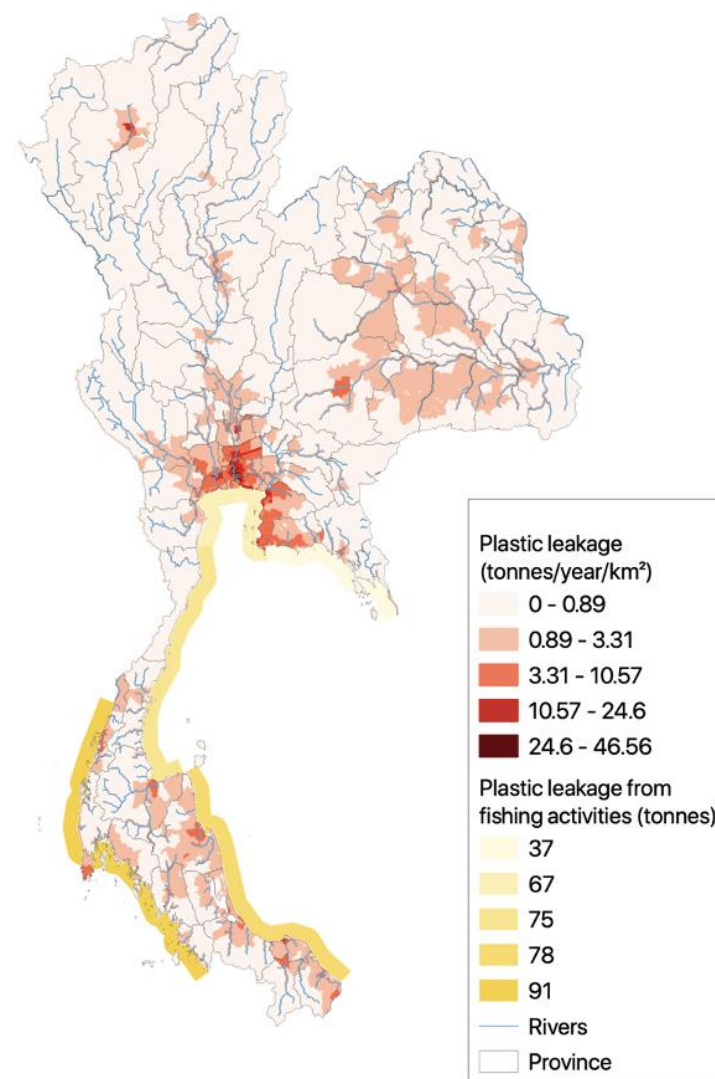
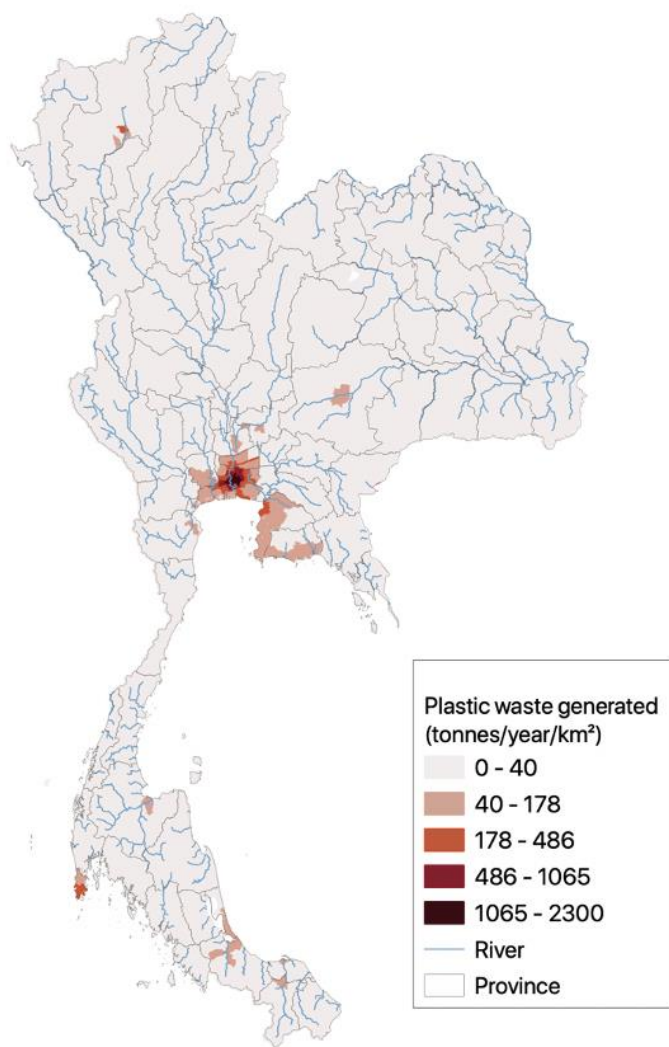


Plastic flow



Mismanaged Waste Index

# Thailand regional hotspots



# Policy and Business



The legal, policy and institutional frameworks governing marine plastics in Kenya



Quantis + ea

## Plastic Leak Project

Methodological guidelines





# Policy

- Coming soon: 5 Scoping Reports: Kenya, Mozambique, South Africa, Thailand, and Viet Nam – the 5 MARPLASTICCs Countries
- These were conducted by the ELC with the support of locally-based experts.
- Visit:  
<https://www.iucn.org/theme/environmental-law/our-work>



The legal, policy and institutional frameworks governing marine plastics in Kenya



# Policy

- Initial review by national stakeholders completed
- Priorities for recommendations identified



The legal, policy and institutional frameworks governing marine plastics in Kenya



# Policy



The legal, policy and institutional frameworks governing marine plastics in Kenya



The legal, policy and institutional frameworks governing marine plastics in South Africa



Quadros legal, políticos e institucional para a gestão dos plásticos marinhos em Moçambique

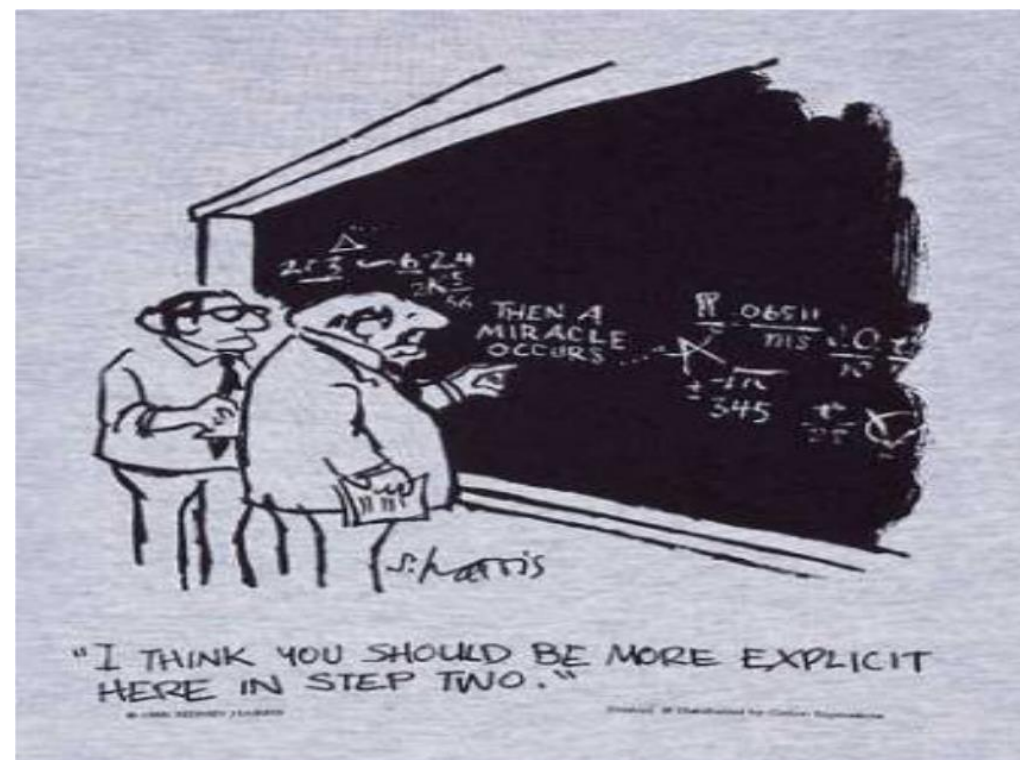


The legal, policy and institutional frameworks governing marine plastics in Mozambique



- Visit: <https://www.iucn.org/theme/environmental-law/our-work>



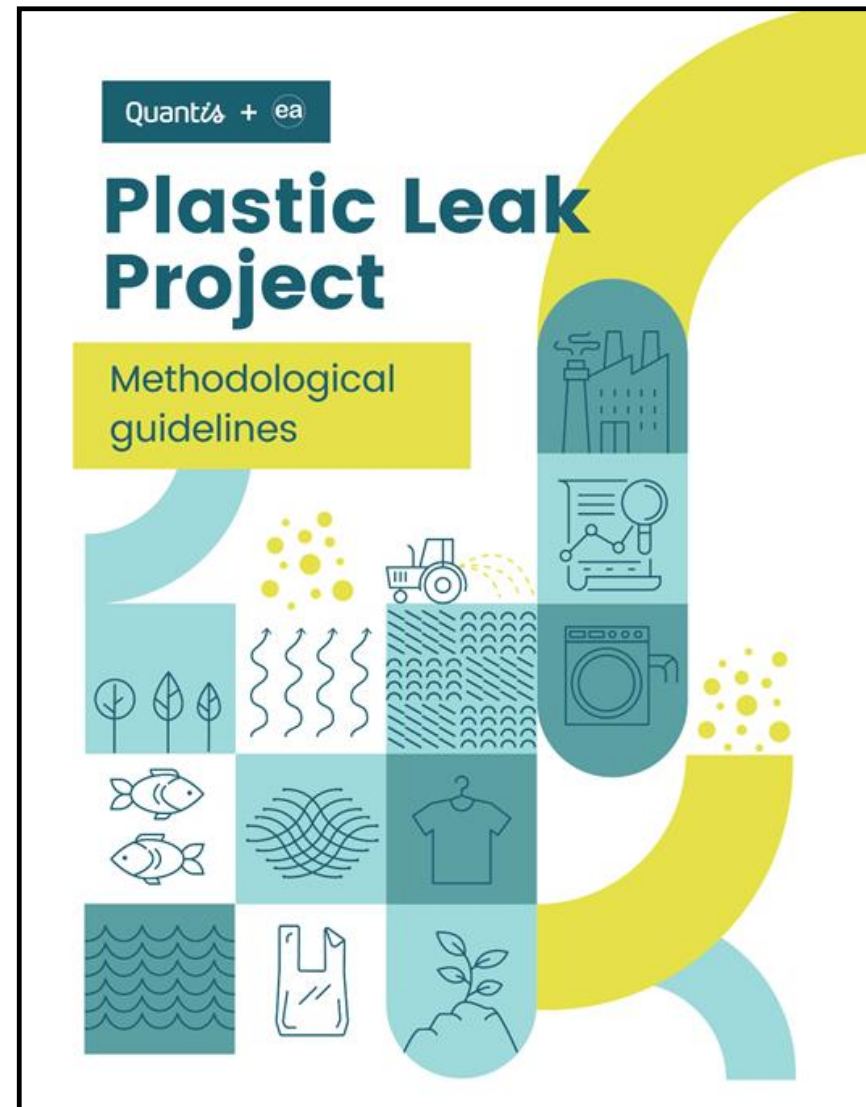




# The Business Angle

The Guidance feeds and complements other efforts and tools to shape and accelerate business action:

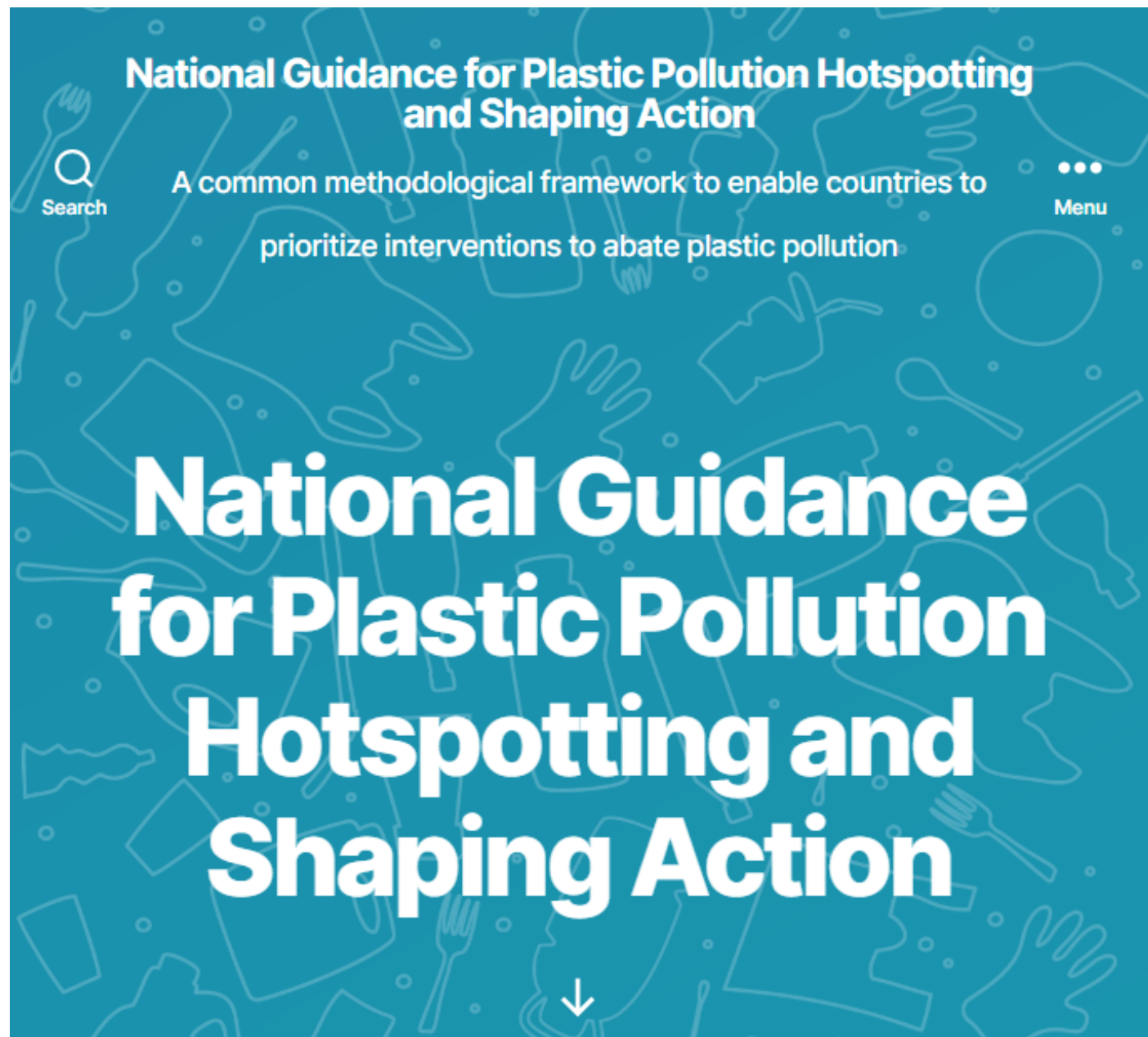
- Plastic Leak Project
- Local business platforms – Thailand, Viet Nam for example
- Extended Producer Responsibility (EPR) roundtable & implementation
- Visit: <https://quantis-intl.com/strategy/collaborative-initiatives/plastic-leak-project/>



# Website

All material is available on the website:

<https://plastichotspotting.lifecycleinitiative.org>



Download the Guidance

Discover the Modules and Tools

Discuss with your colleagues

Get in Touch (next webinars coming soon on the PLP tool for Business, and much more) !

<https://plastichotspotting.lifecycleinitiative.org/>

# Thank you!

Supported by the Swedish International Development  
Cooperation Agency  
and  
Ministry of Climate and Environment of Norway



Implemented and authored by

