

Plastic leakage as a guiding principle for packaging ecodesign

82 th Discussion Forum, Zurich
Addressing the issue of plastic pollution: status quo and the way forward

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4/11/2022

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- 02 Principle 4 on Optimizing End-of-life
- 03 Plastic Leak Project guidelines to cover Principle 4
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What is a sustainable packaging?

A

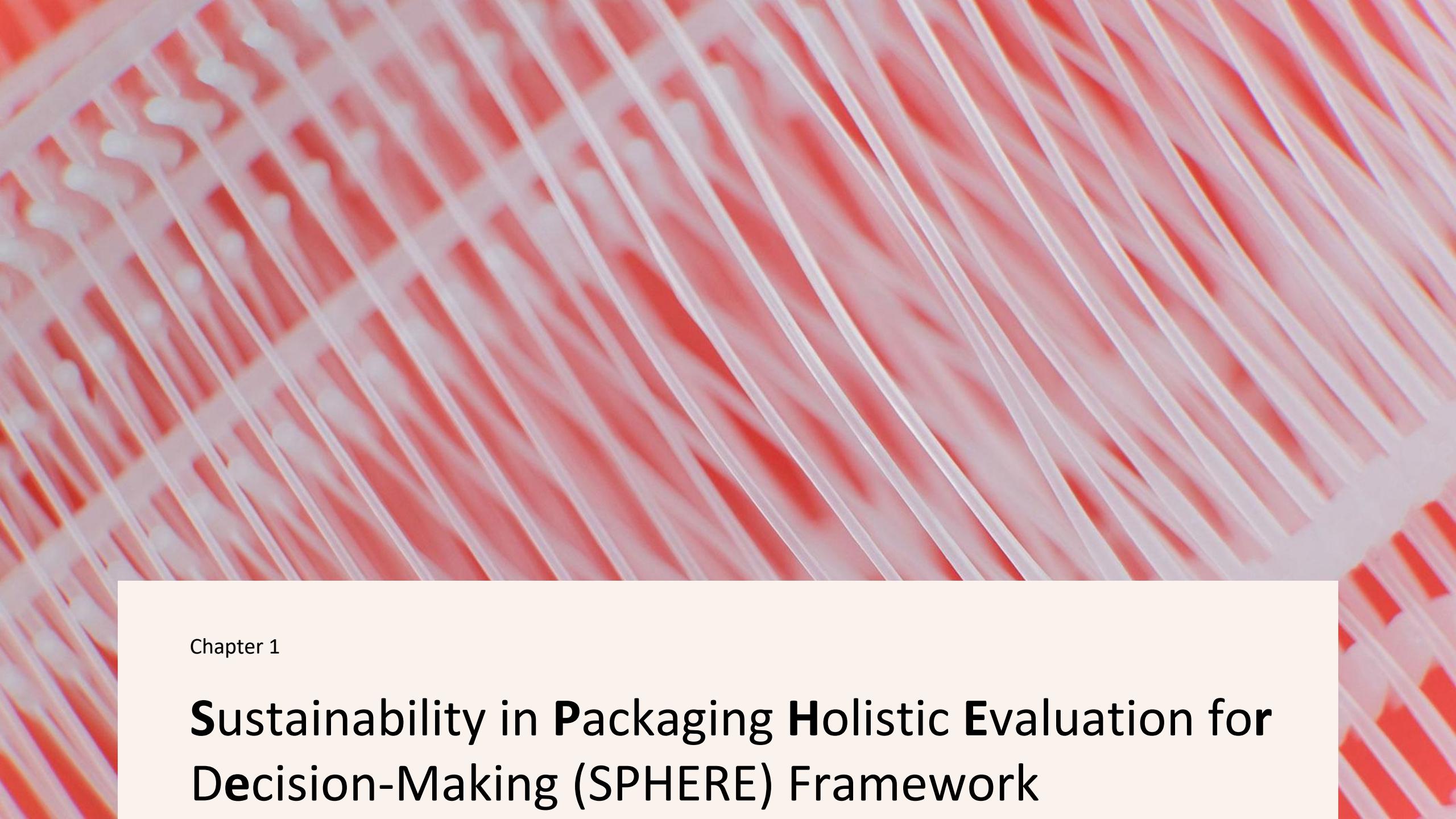
“Safe and cost-effective”

B

“Low carbon footprint”

C

“Maximum circularity and minimum environmental footprint, while avoiding the presence of harmful substances.”



Chapter 1

Sustainability in Packaging Holistic Evaluation for Decision-Making (SPHERE) Framework

Context



What is it?

The Sustainable Packaging Framework (SPHERE) was developed by **Quantis, EA and South Pole for the WBCSD**. It was recently launched in **mid-April 2022**.

It is the first framework that **includes all aspects of the sustainability and circularity of packaging**, as well as capturing potential **trade-offs**.



Goal and scope

It allows businesses to speak a common language across the value chain, ensuring **credibility** and **comparability** of outcomes.

It supports companies' objective **decision-making process** for packaging material or delivery system

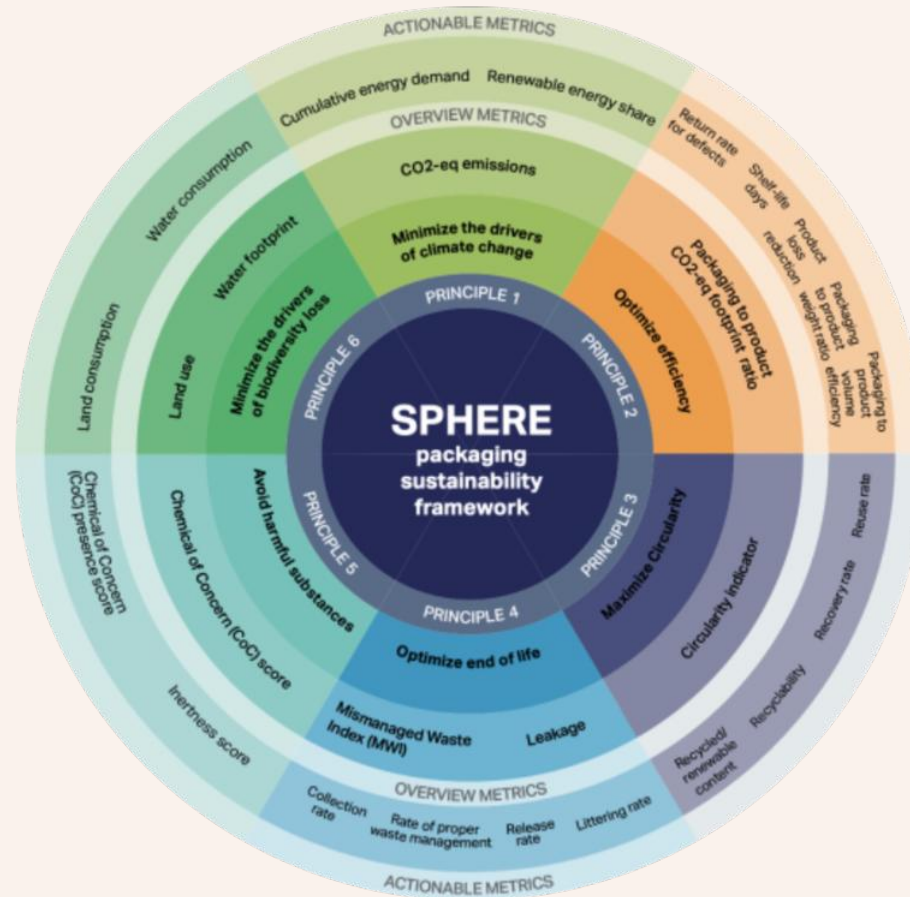
Its scope: **cradle to grave** for the whole framework.

Its focus: **what packaging producer can act upon** within decision making scope.

SPHERE: The Packaging Sustainability Framework (WBCSD)

Framework guiding principles:

- Sustainability in packaging is defined by 6 principles.
- Each principle is measured by at least one metric.

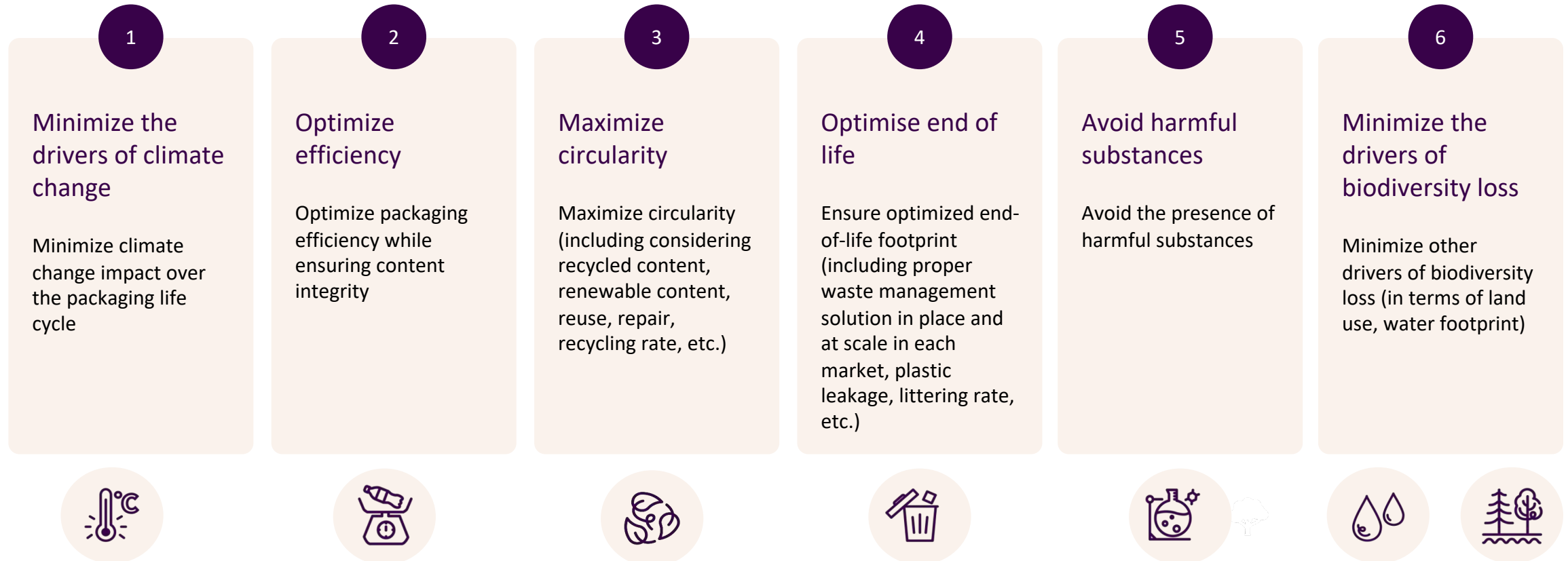


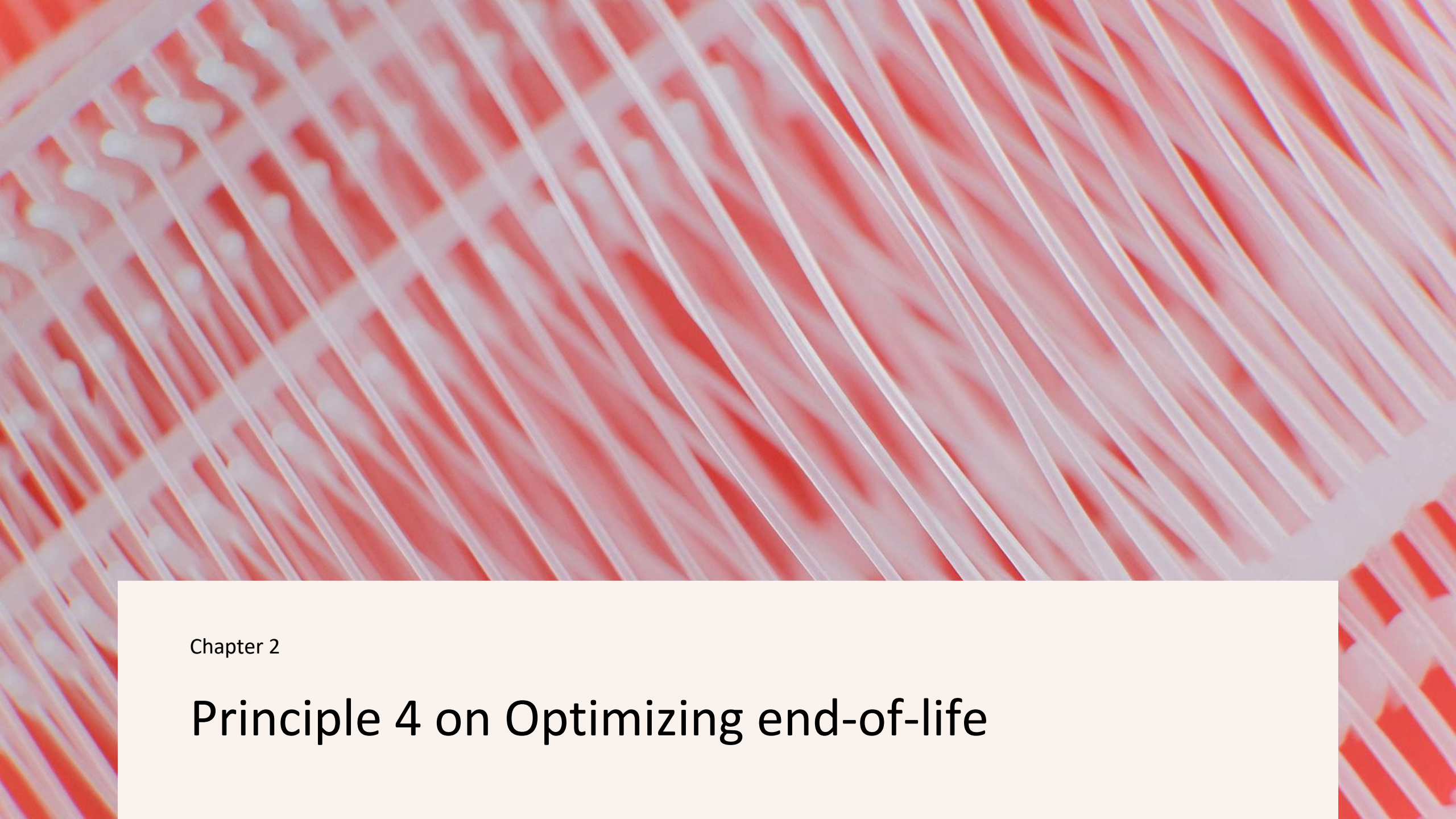
Available at www.wbcSD.org

SPHERE was developed by Quantis, EA and South Pole for the WBCSD. It was recently launched in mid-April 2022.

6 principles for sustainability in packaging definition

SPHERE defines sustainability in packaging as maximum circularity and minimum environmental footprint, while avoiding the presence of harmful substances.



The background of the slide features a complex, abstract pattern of overlapping, wavy lines in shades of red and white. The lines are oriented diagonally, creating a sense of movement and depth. The overall effect is reminiscent of a woven fabric or a textured surface.

Chapter 2

Principle 4 on Optimizing end-of-life

6 principles for sustainability in packaging definition

SPHERE defines sustainability in packaging as maximum circularity and minimum environmental footprint, while avoiding the presence of harmful substances.



Framework guiding principles

Metric:

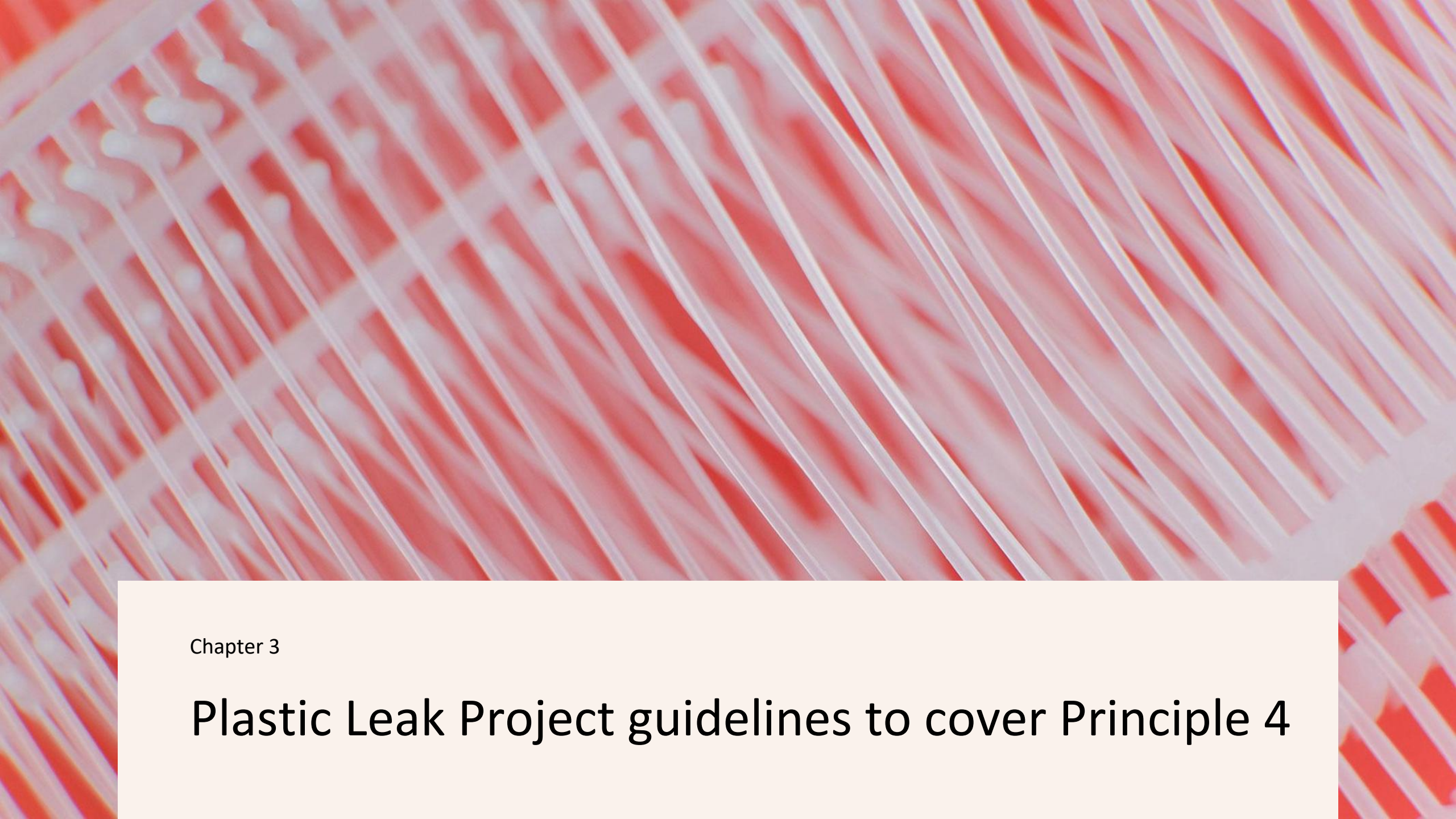
"To assess the Mismanaged Waste Index (MWI) of a given packaging, we recommend you to refer to the MWI of the different countries that represent the product's end-market.

Researchers have developed several methodologies to evaluate MWI values by country for all waste, such as:

- Plastic waste inputs from land into the ocean
- Future scenarios of global plastic waste generation and disposal
- The Plastic Leak Project

For generic information on national-level waste management and MWI of municipal solid waste we suggest you use the What a Waste v2.0 dataset.

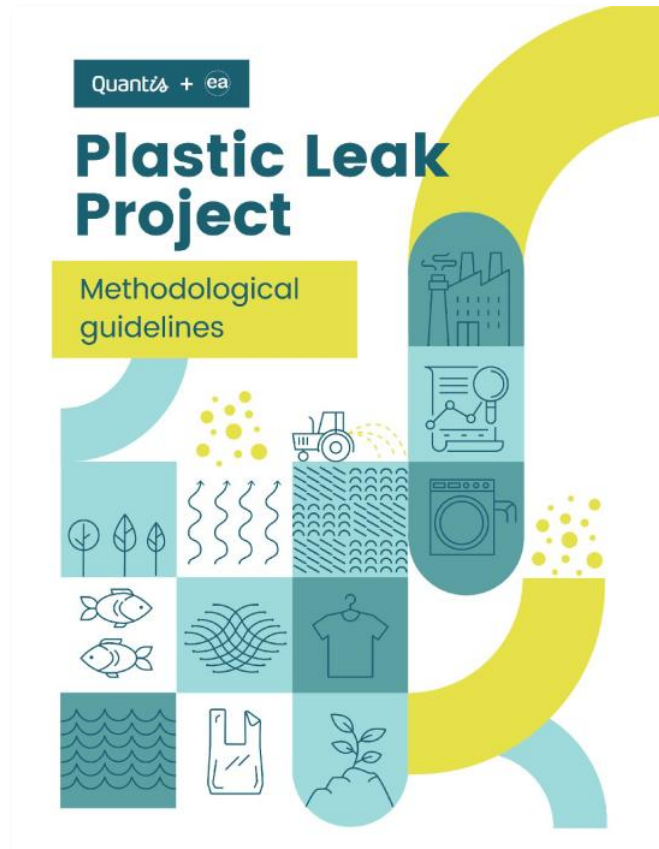
The PLASTEAX data platform provides a more detailed approach for plastic packaging only. In the case of a plastic leakage assessment, we recommend using the methodology developed by the Plastic Leak Project."

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Chapter 3

Plastic Leak Project guidelines to cover Principle 4

Framework guiding principles



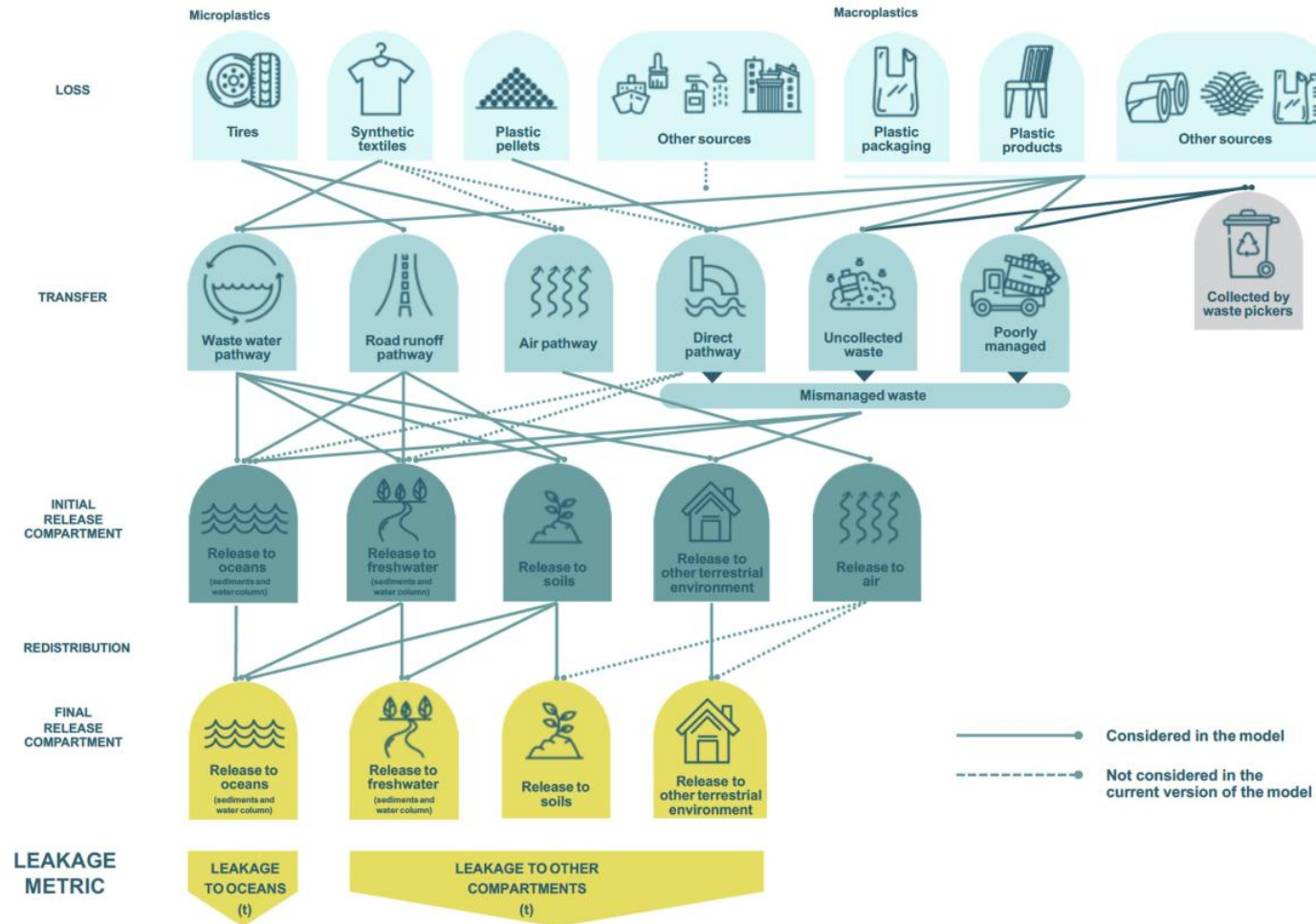
The Plastic Leak Project

- + First science-based methodology
- + To map, measure and forecast plastic leakage along the value chain
- + With industry-specific guidance and metrics

The PLP Guidelines help identify the main sources and pathways of plastic leakage, how much leakage occurs and where it ends up



The PLP model

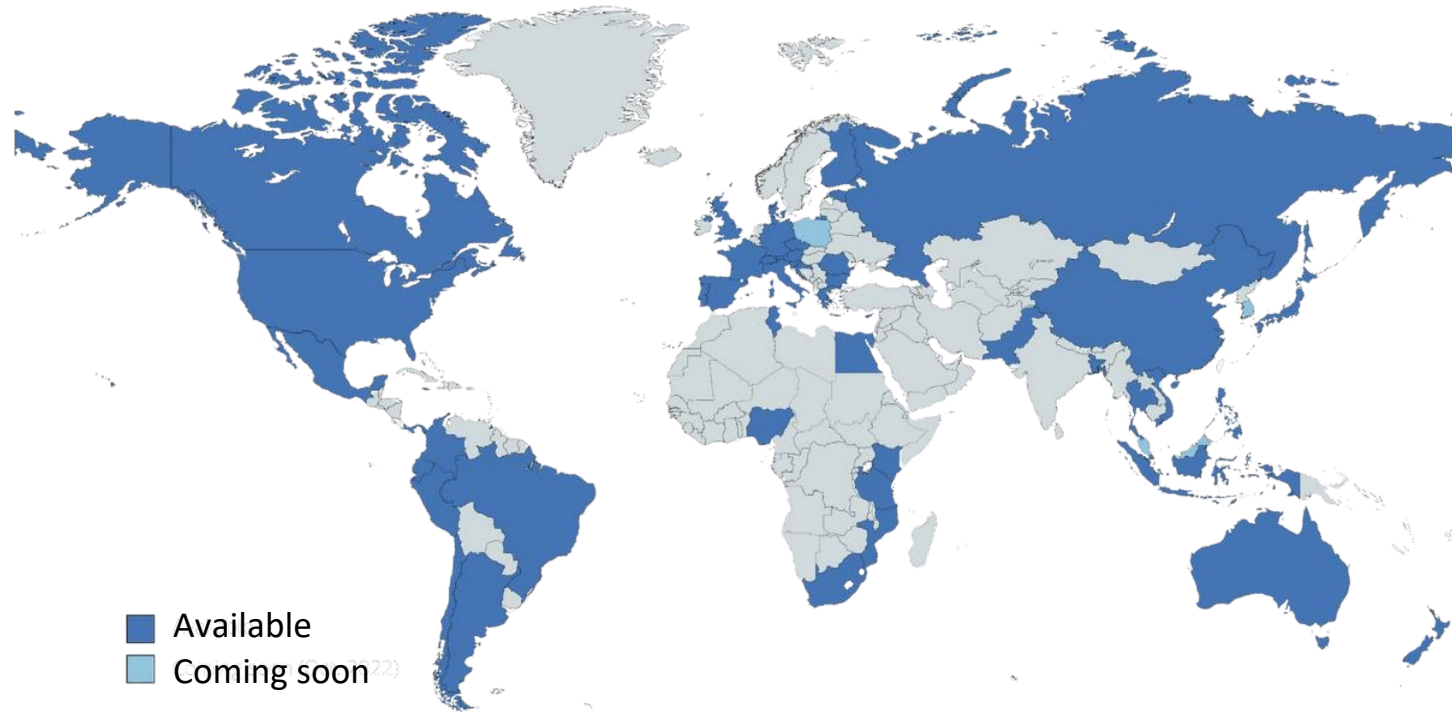


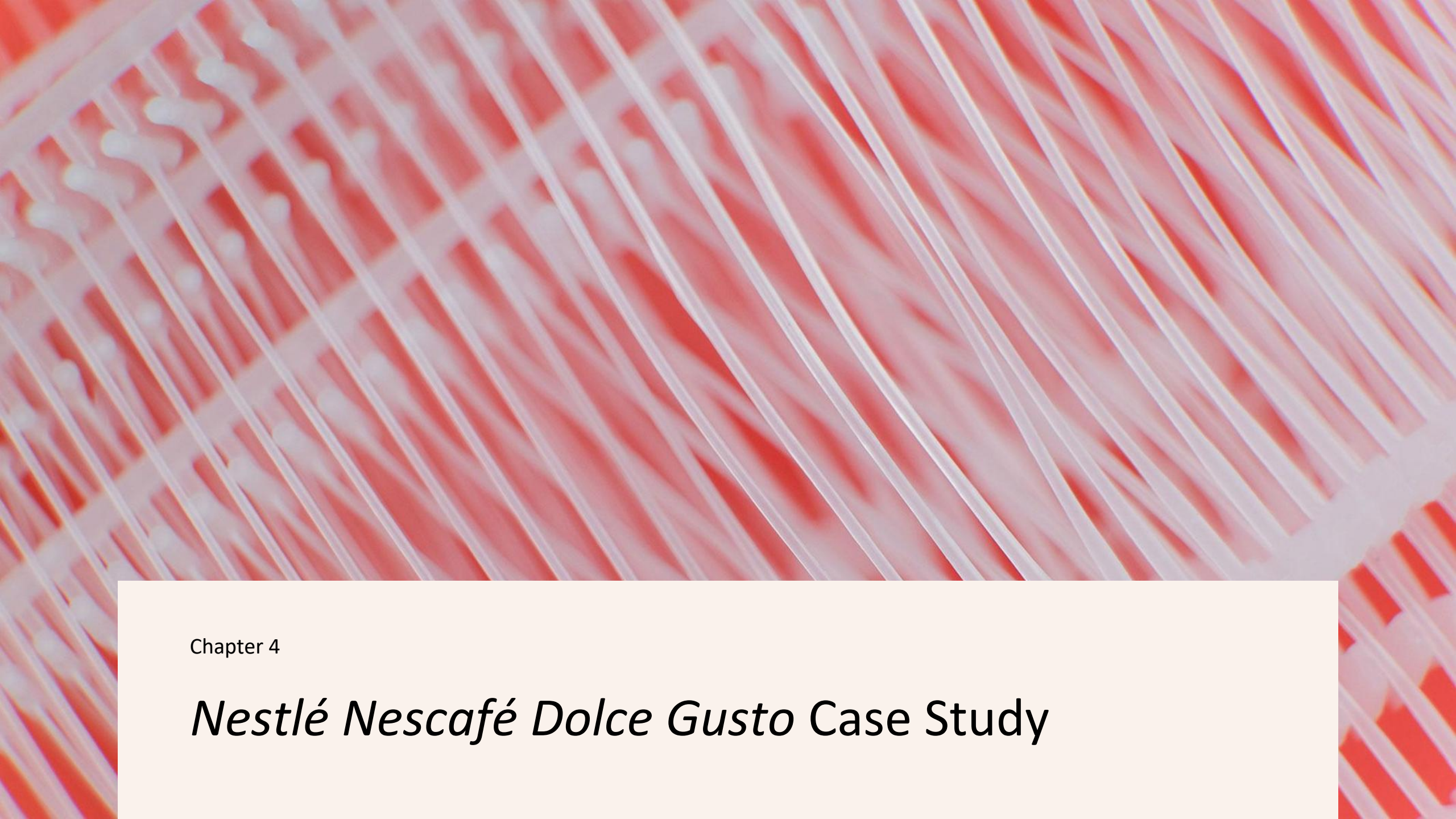
$$\begin{aligned}
 \text{TotTireLoss}_{\text{plane}} \text{ [kg microplastics]} \\
 &= \text{NbCycle} \text{ [cycle]} * \text{Loss}_{\text{aircraft_tires}} \left[\frac{\text{kg tread}}{\text{cycle}} \right] \\
 &* \text{ShPolymer}_{\text{aircraft_tires}} \left[\frac{\text{kg microplastics}}{\text{kg tread}} \right]
 \end{aligned}$$

Type of vehicle		Loss _{vehicle_tires} Loss of tire tread per kilometer travelled by the vehicle [mg (tread) / (vhc*km)]
Motorcycle	Motorcycle	45
	Scooter	45
Passenger car/light truck	Passenger car	102
	Light truck	142
Bus/coach	City bus	415
	Long haul coach	326
Medium/heavy truck	Medium/heavy truck long haul	517
	Medium/heavy truck short haul	658

Databases: PLASTEAX and World Bank

- + PLASTEAX offers plastic waste management data at both country and polymer specific levels.
- + World Bank (2018) provides a comprehensive data of municipal waste end-of-life





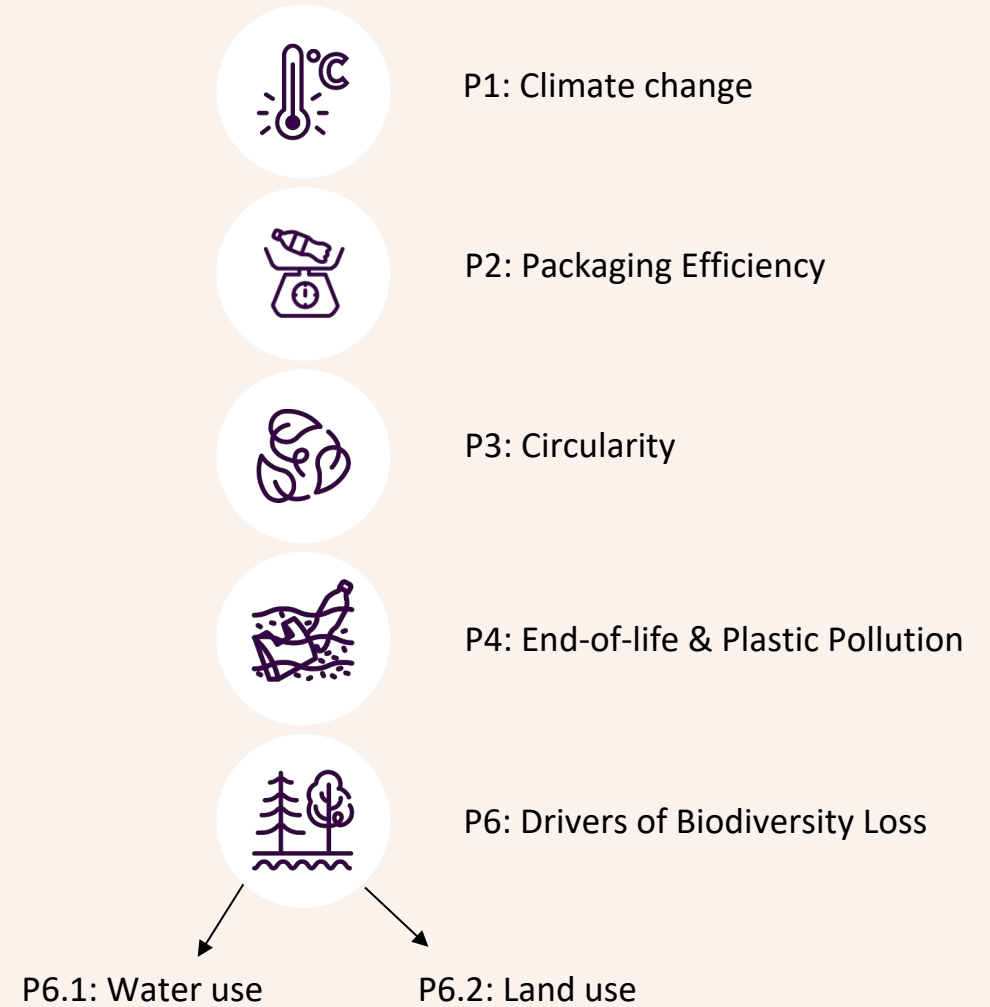
Chapter 4

Nestlé Nescafé Dolce Gusto Case Study

System Boundaries



SPHERE Principles Assessed:



Scenarios analysed

A

Virgin
Plastics

B

Recycled
Plastics

C

Biobased
Materials A

D

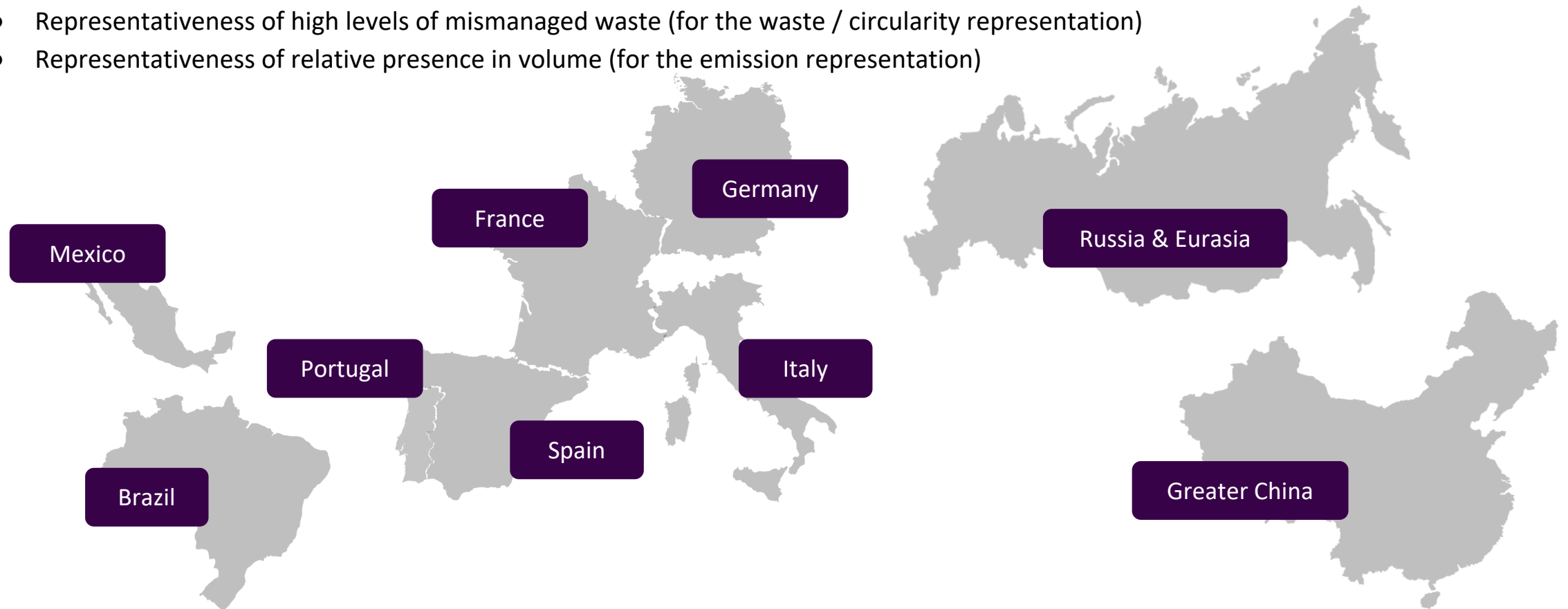
Biobased
Materials B

Functional unit: 1 cup of coffee (1 capsule with R&G coffee – Black Cup)

Distribution Markets

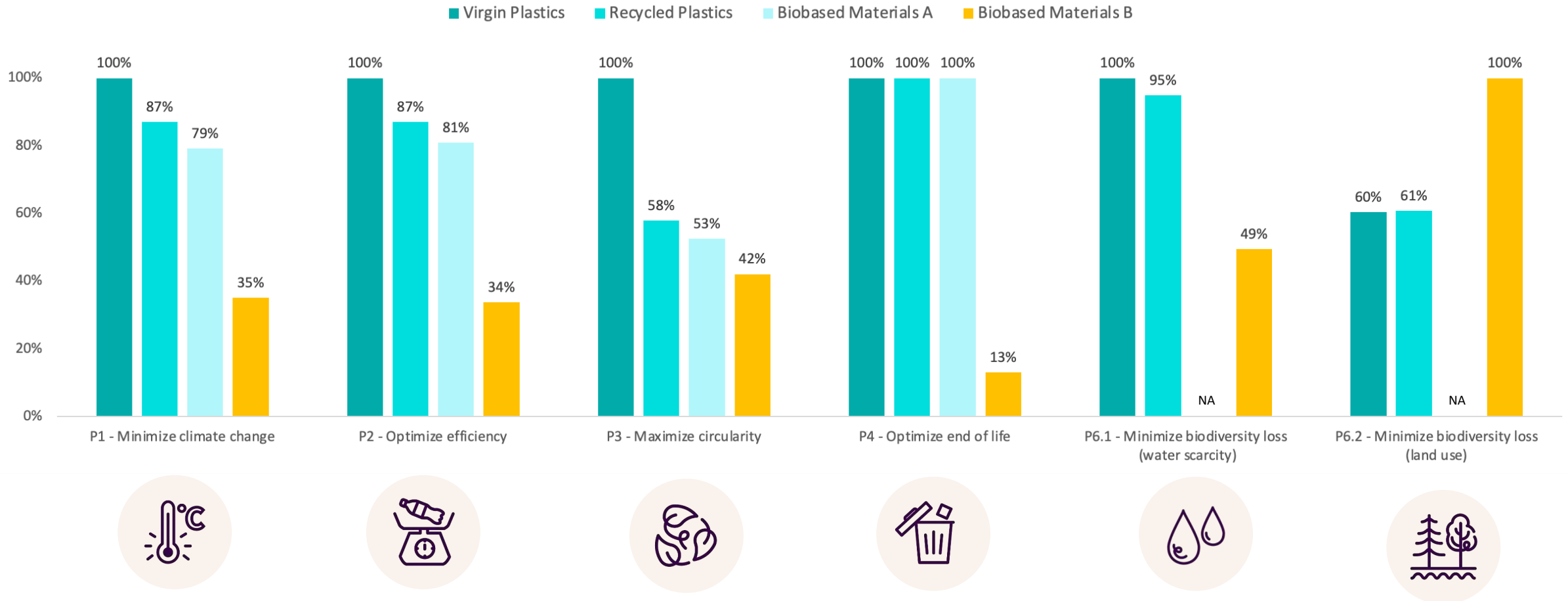
Markets were chosen according to:

- Representativeness of high levels of mismanaged waste (for the waste / circularity representation)
- Representativeness of relative presence in volume (for the emission representation)

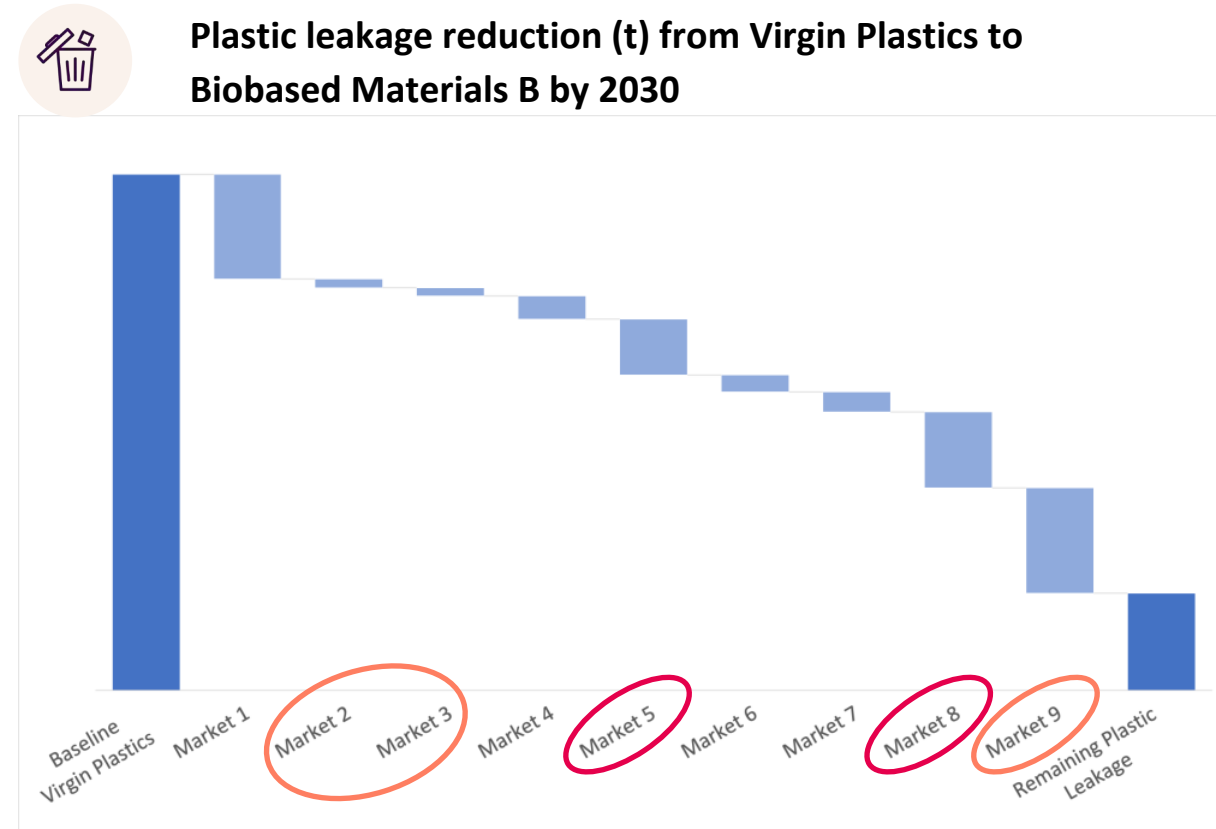
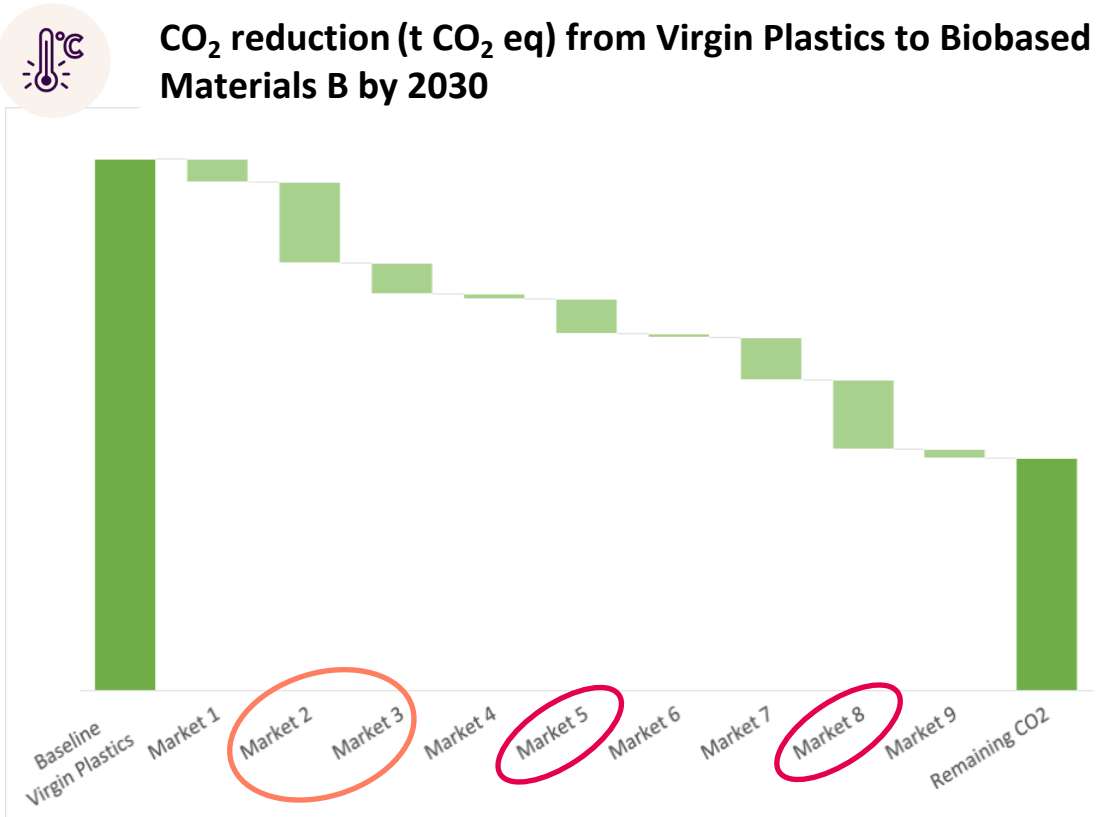




Black cup, all markets

Packaging comparison by framework principle



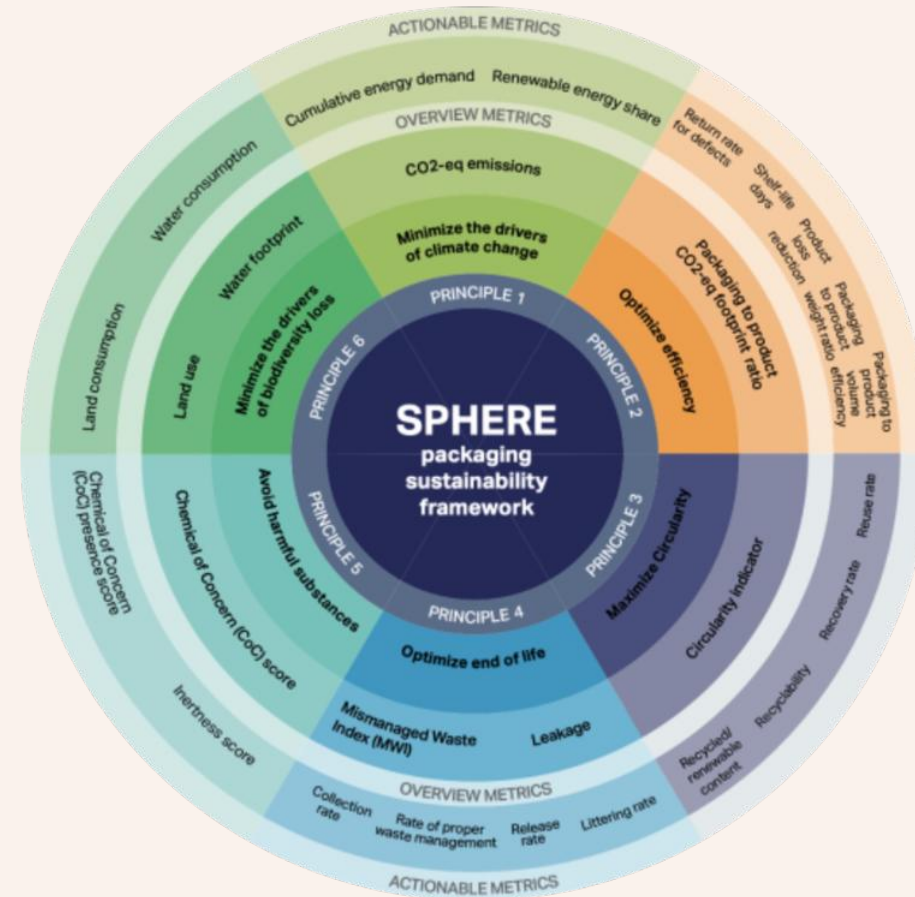
100% "Option D: Biobased Materials B" adoption by 2030



-  **High priority markets:** With significant impact reduction for only one indicator (either carbon footprint or plastic leakage)
-  **Very high priority markets:** With significant impact reduction for both carbon footprint and plastic leakage indicators

Takeaways

- + The PLP model using the PLASTEAX and World Bank database (2018) can be used to assess plastic leakage at the inventory level, and integrated in the SPHERE framework to provide a holistic understanding of a packaging environmental impact.
- + SPHERE, among other initiatives such as MariLCA, constitute important steps towards integrating plastic mismanagement and leakage into environmental performance metrics.



Thank you!



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