Tray to tray recycling:

Myth or Reality ?

www.petcore-europe.org

Tray to tray recycling: Myth or Reality ?

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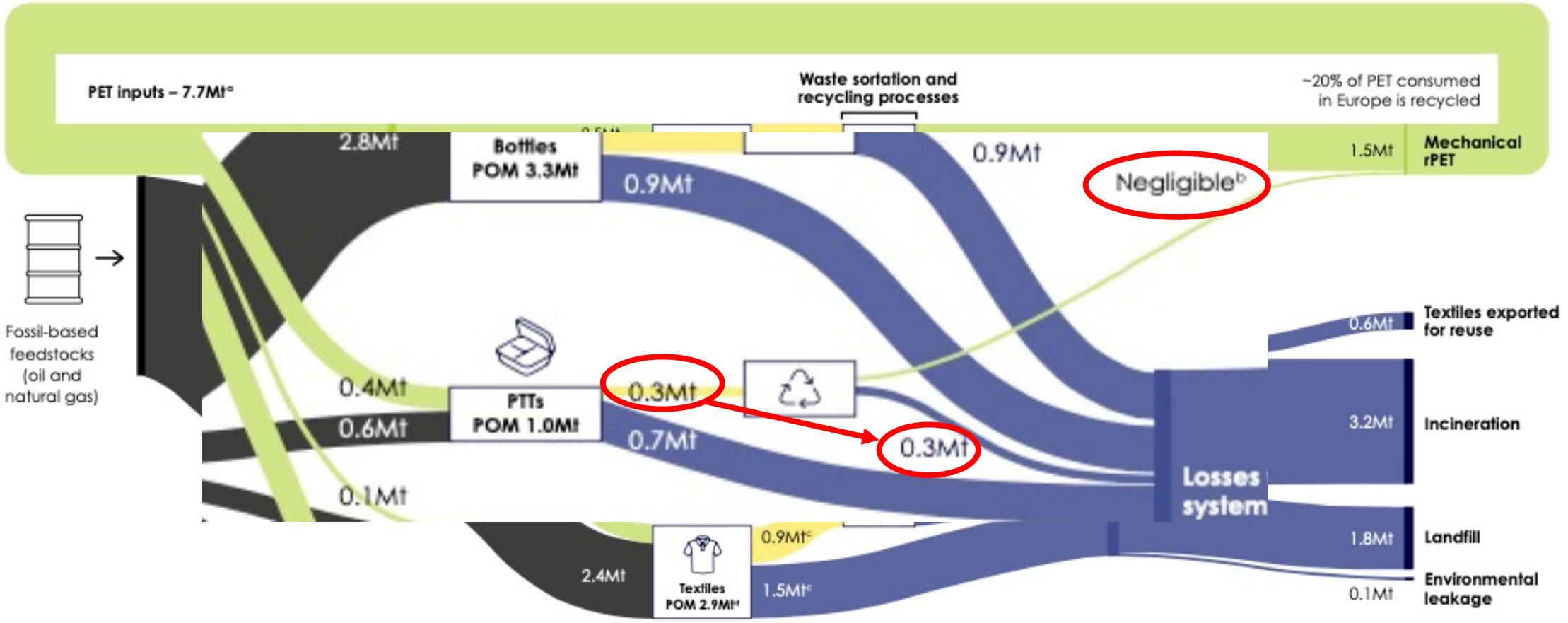
Tray to tray recycling: Myth or Reality ?

The way to the circularity of the PET Thermoformed containers?

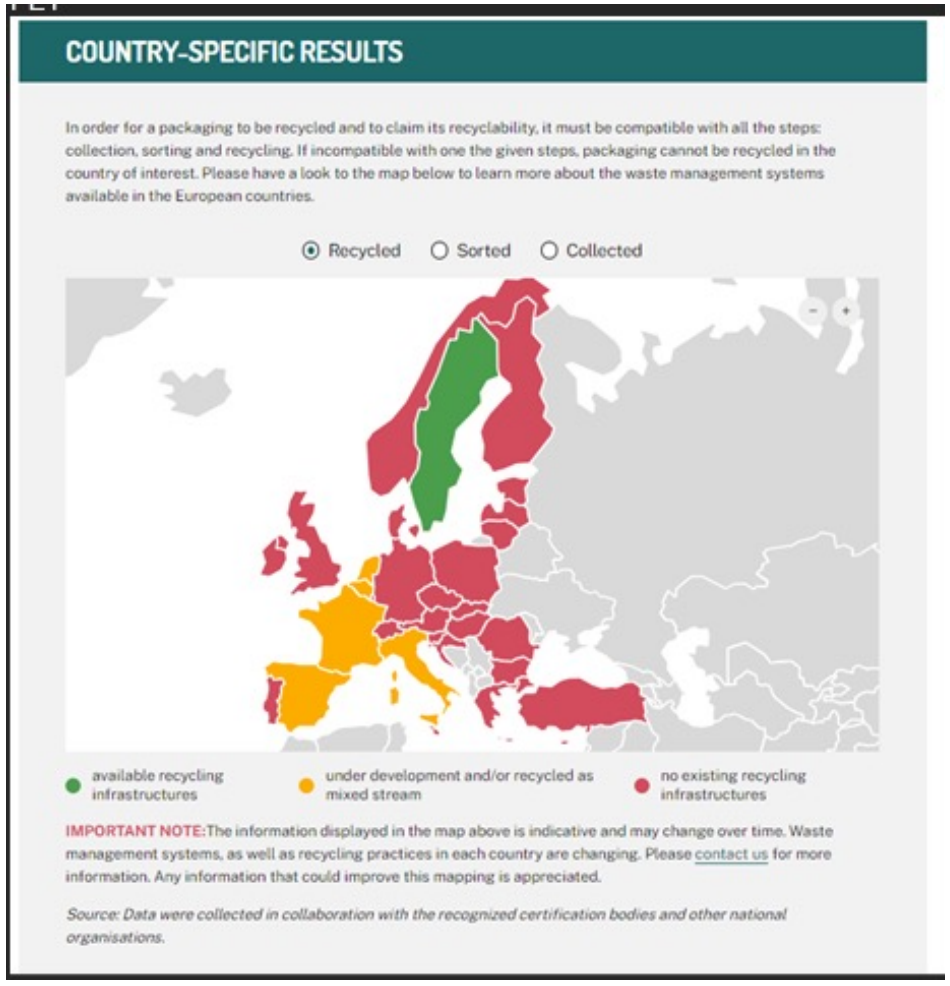
- **Current situation of Collection and recycling of trays**
- Initiatives
  - Converters
  - Recyclers
- TCEP.- the importance of Design for recycling and recyclability Protocols
  - TCEP Example.
- Regulatory burden. Functional Barrier
- Q&A

EUROPE PET MATERIAL BALANCE



Source.- SYSTEMIC. Circular PET and Polyester Full report July 2023

COLLECTION AND RECYCLABILITY



Packaging type	
Pots/ trays/ blisters	**France:** The PET pots and trays recycling stream is under development. **Australia:** Whilst there is currently no recycling infrastructure for PET non-bottles available, these packaging types are recognised as recyclable by the Packaging Recyclability Evaluation Portal (PREP). According to PREP the dimension of these packaging types shall not exceed 231 mm in two dimensions. **UK:** Whilst there is currently no recycling infrastructure for PET non-bottles available, these packaging types are recognised as recyclable by the On-Pack-Recycling-Label (OPRL) system. **US:** These packaging types are recognised as "widely recyclable" in the US based on national guidelines.

Source.- RETAILER. Name kept confidential

COLLECTION AND RECYCLABILITY

Collection and sorting strategies for PET Thermoformed packaging

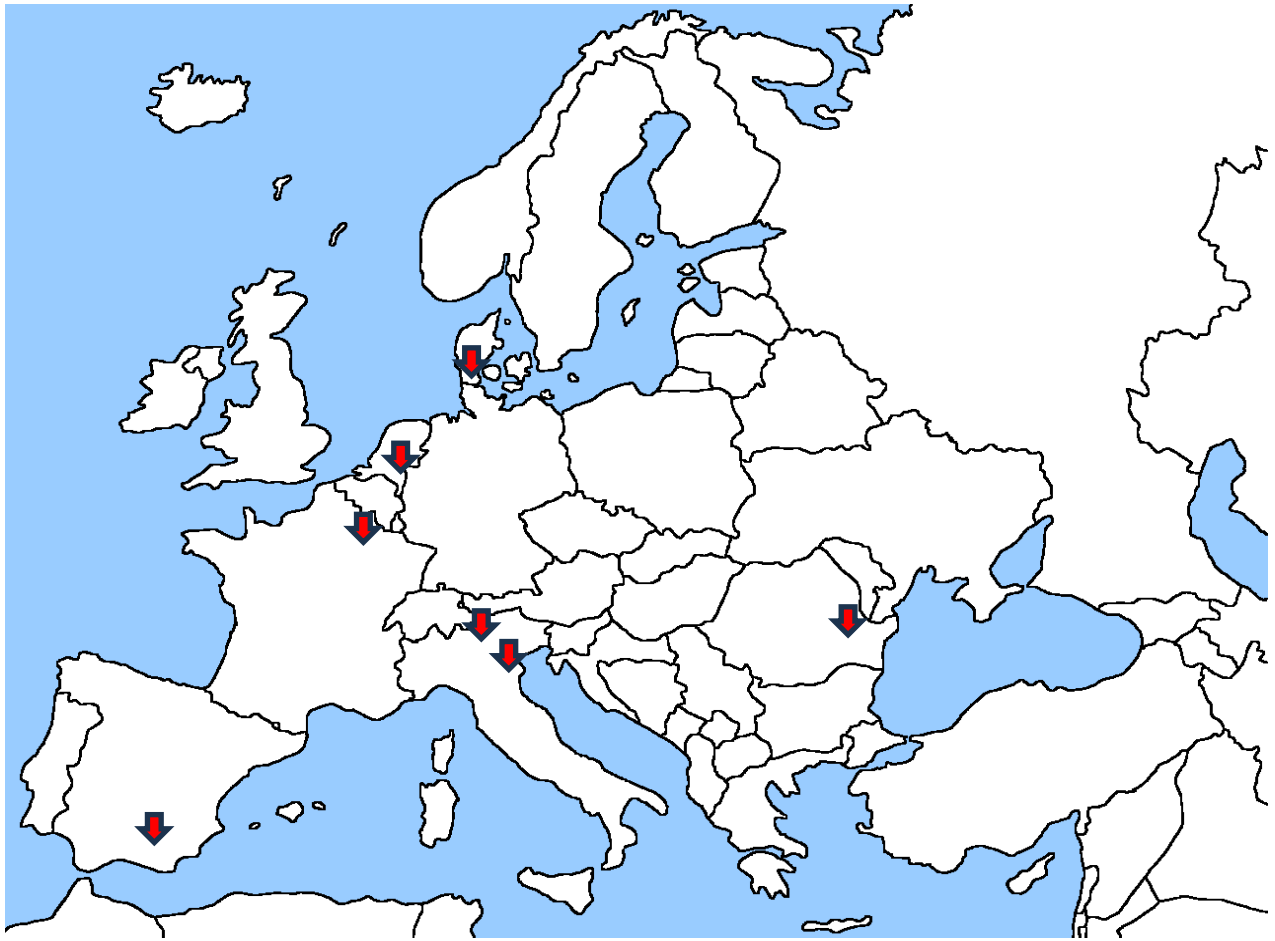
- EPR: Dedicated streams at sorting center (e.g., FOST PLUS, CITEO, COREPLA…)
- EPR: Mandatory Recyclability Performance for bottle recyclers to incentive a secondary recycling of thermoforms
- Private companies' recovery
- Tray-to-Tray initiatives for post-industrial (from packaging companies) and post-consumer (from retailers)

COLLECTION AND RECYCLABILITY

European Thermoforms Recycling map

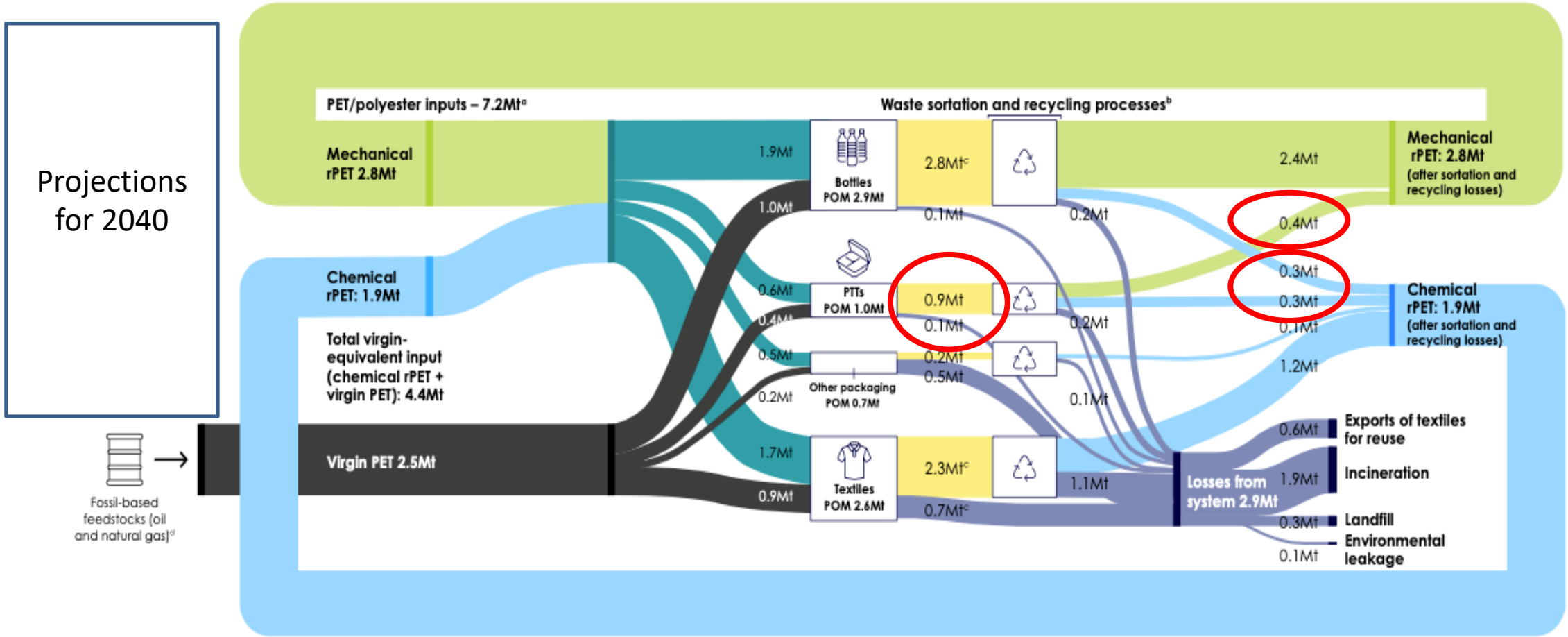
Main milestones

- Recycling thermoforms for more than 15 years
- Companies with dedicated technology for thermoforms
- More than 300 kTon Recycling Capacity (installed)



EUROPE PET MATERIAL BALANCE

Projections for 2040



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Presenting for

Tray to Tray recycling - current status

Aron Damen

Director Recycling, Managing Director Cirrec

Cirrec - a part of Faerch

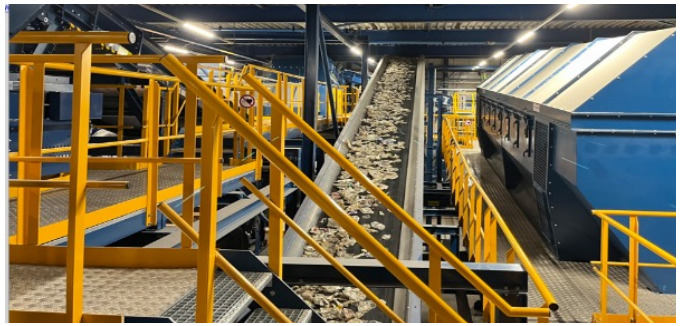
Faerch | *Packaging that cares*

Faerch has a clear ambition to accelerate PET tray recycling in Europe and drive sustainability journey in food packaging

RECYCLING STATUS AND AMBITIONS

Technology mature, focus on scaling

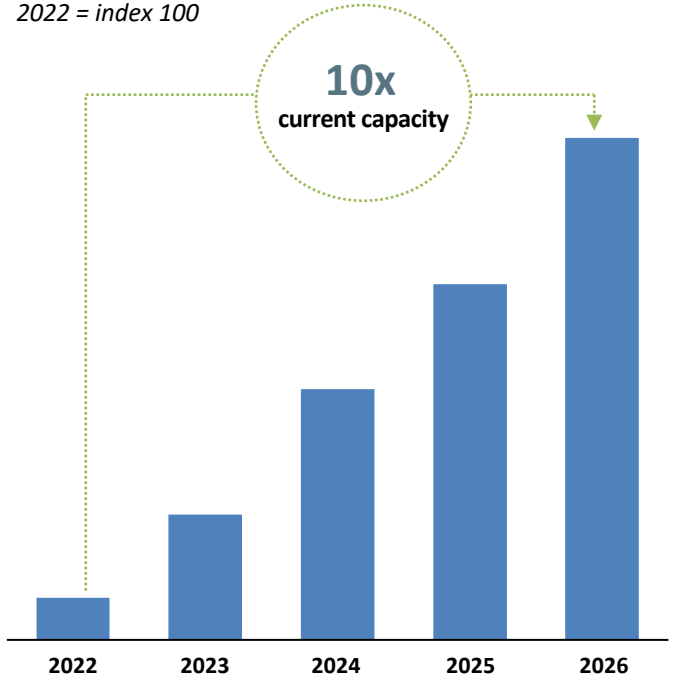
Chemical recycling complementary to mechanical recycling for PET packaging,
based on cost and CO_2 impact.



Target to increase capacity with >1,000%

Recycling Tray input tonnage ambition

2022 = index 100



Regions to support scaling

Accelerating PET tray recycling in Europe

DRIVING CIRCULARITY IN FOOD PACKAGING

Market circularity achieved

- The Netherlands
- Belgium

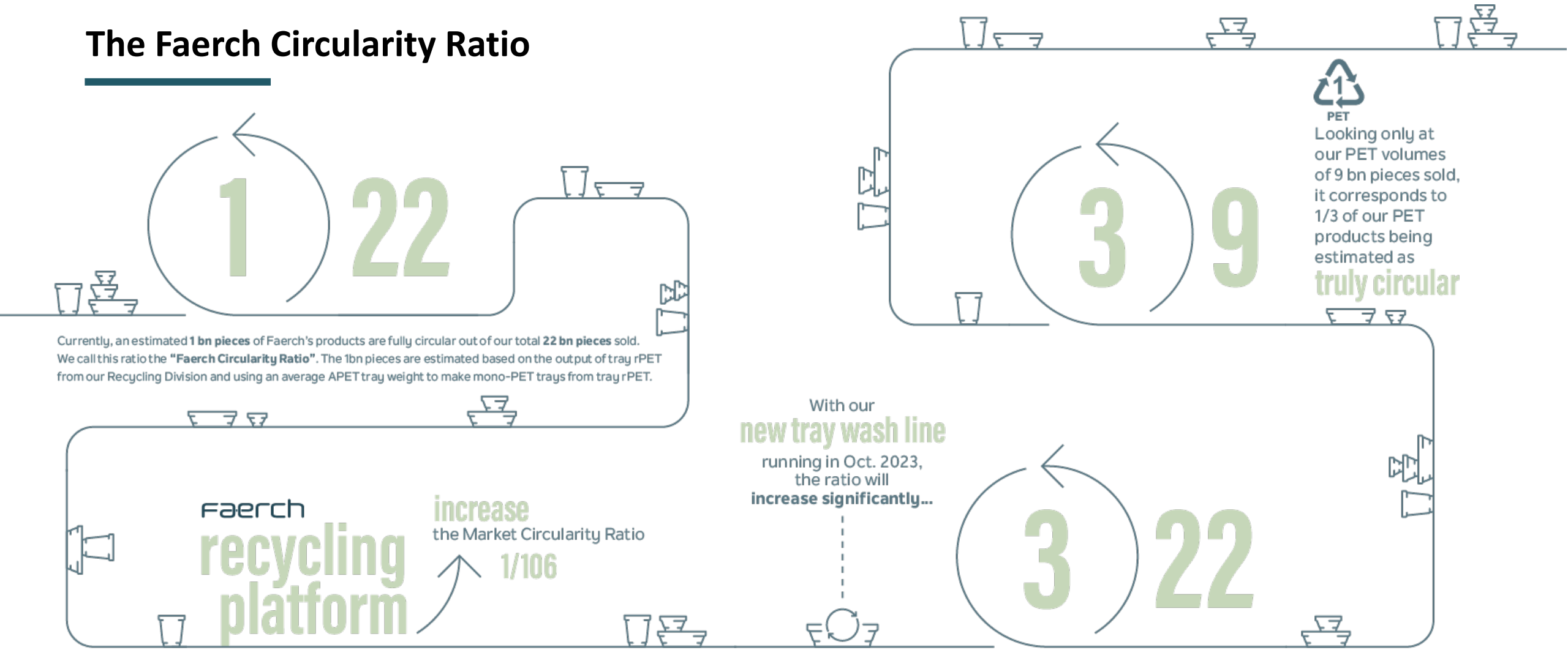
Up next

- Germany
- Denmark
- Norway
- Sweden
- Finland

Exploring partnerships

- United Kingdom
- Spain
- Italy

The Faerch Circularity Ratio



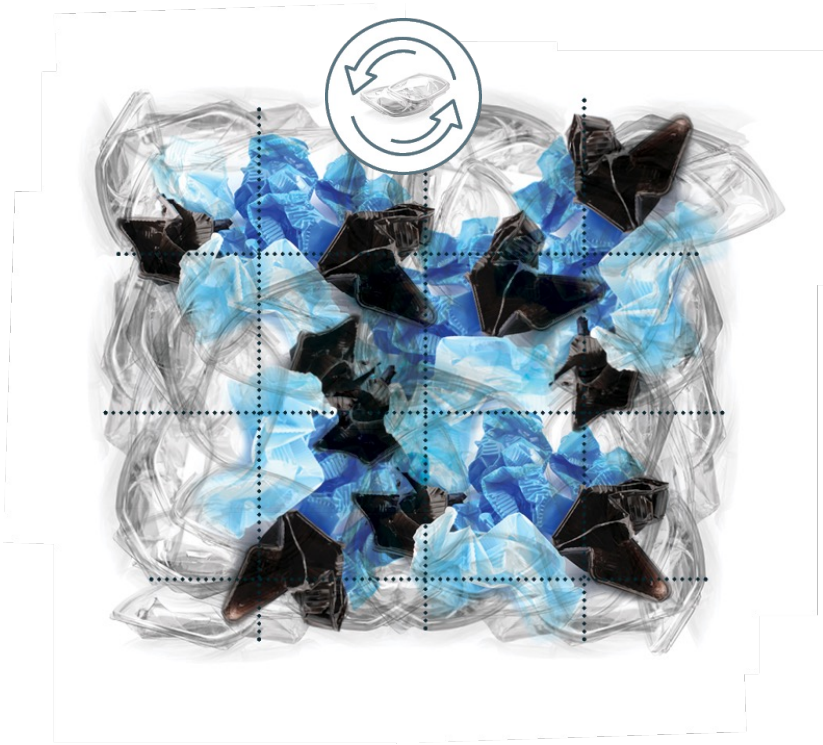
In Europe, around **106 bn pieces** of rigid food packaging are produced p.a. We need to increase the Circularity Ratio in the market. This is why we open up our recycling platform for competitors to establish rPET from trays (PTT) as a global commodity.

2022 numbers

To achieve true circularity, we need a balanced waste stream and ”stop stealing” rPET from the bottle industry

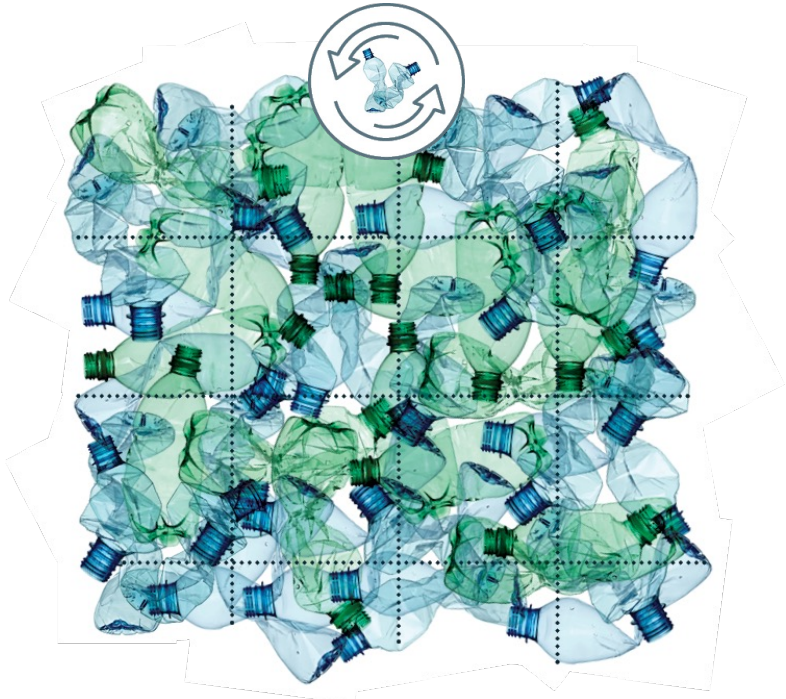
FOOD TRAYS MADE OF “TRAY-BALES” AND BOTTLES MADE OF “BOTTLE-BALES”

Tray-to-tray



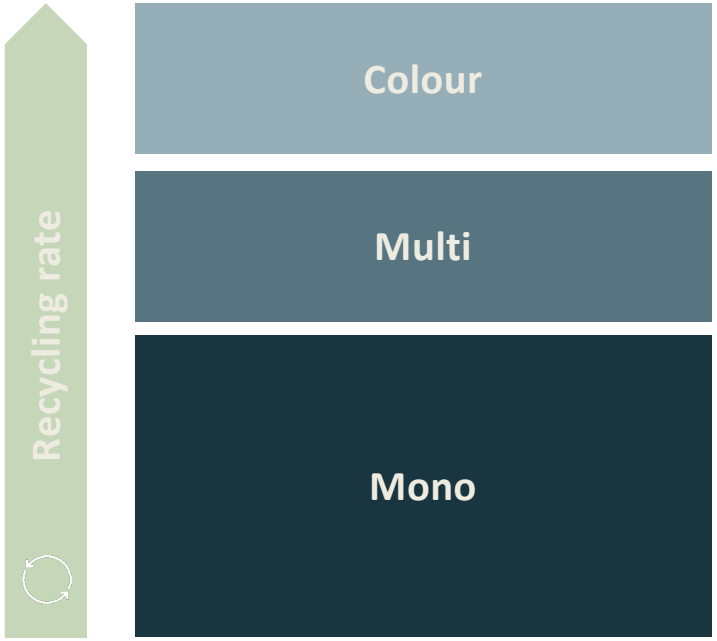
No transfer between waste streams

Bottle-to-bottle



All PET trays are fully recyclable: Feedstock impact on tray quality when using tray RPET

Faerch strategy maximizing recycling rates:
take in all types of post-consumer trays resulting in product challenges



No cherry-picking of post-consumer waste

- PET / PET-PE / MAPET / transparent / coloured / with label / with sealing film
- Maximizing technology capabilities
- Providing outlet for multi and coloured within Faerch: CPET and coloured APET

Coloured and clear – full material responsibility

BEING AN INTEGRATED RECYCLER-THERMOFORMER WE DEVELOP ALL rPET INTO EFSA APPROVED PRODUCTS

Clear rPET:

Clear products

Coloured rPET:

Evolve by Faerch

No challenges for functional barrier, we decontaminate all rPET

At Faerch we recycle pots, tubs and trays back into food grade material
– **both coloured and clear**

Product examples: coloured and clear trays from tray R-PET










SAVE THE DATE

18TH APRIL 2024

Transforming Waste into Valuable Resources

You are invited to join us on April 18th, 2024, for the Grand Opening of Faerch's Cirrec plant in Duiven, Netherlands.

We have made significant investments to fully scale our pioneer plant Cirrec - the industry's first industrial PET tray recycling line, and it brings us immense pride to introduce our flagship plant to the broader industry.

FAERCH.COM/GRAND-OPENING

- for more information about the event

What is kp doing?

Close the packaging loop

More than 700 M/year of post consumer trays into new trays

By the end of 2025, at least 30% of recycled material in our packaging will include 'Tray2Tray™' material.

- **Establishing dedicated program** to 'close the loop' for trays and rigid films
- **Increasing the use of tray flake** as kp's main goal through partnerships with local recyclers
- **Working with customers and suppliers to** 'push' and pull demand for PET trays

Progress

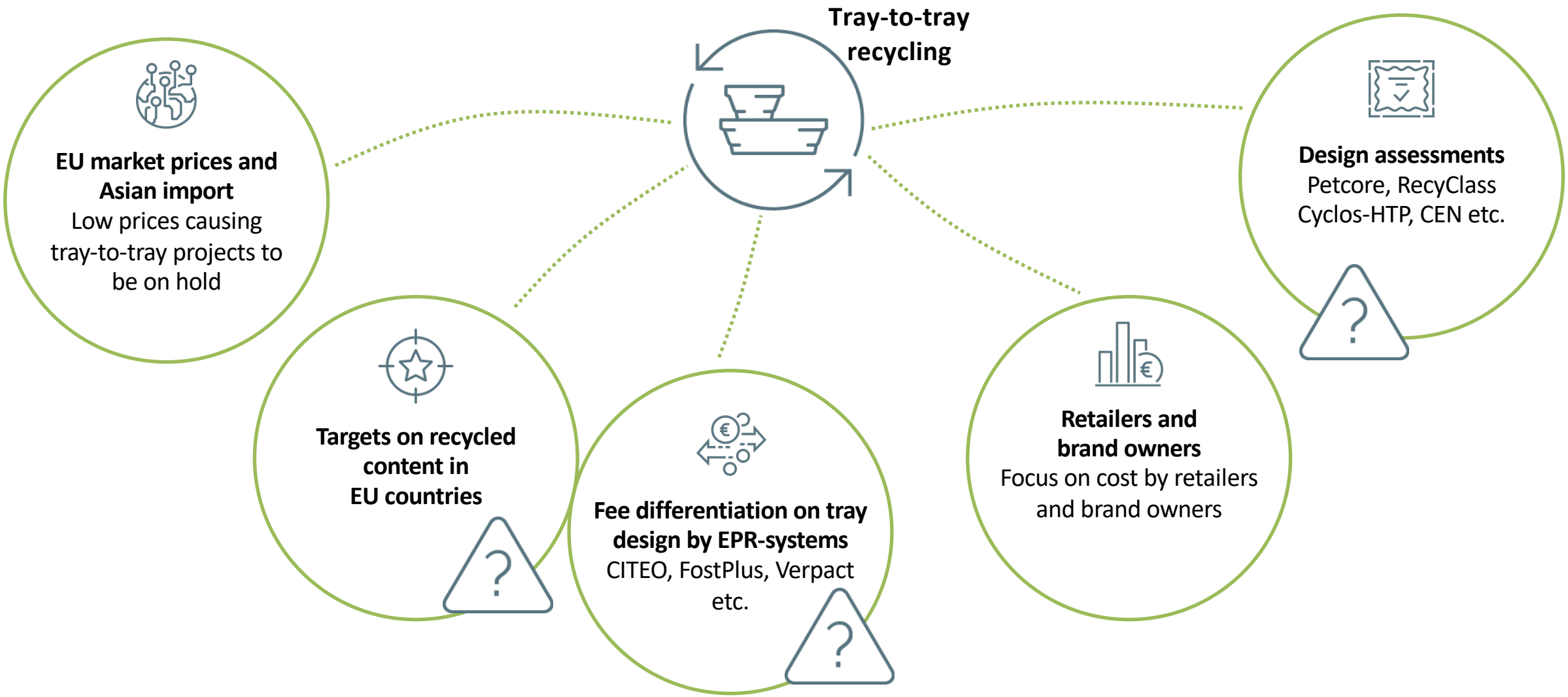
Tray2Tray

12%

of our recycled material in food packaging is already coming from kp Tray2Tray™

Challenges for the tray-to-tray market

Challenges in the market and forces determining the developments of tray packaging that impact tray-to-tray recycling



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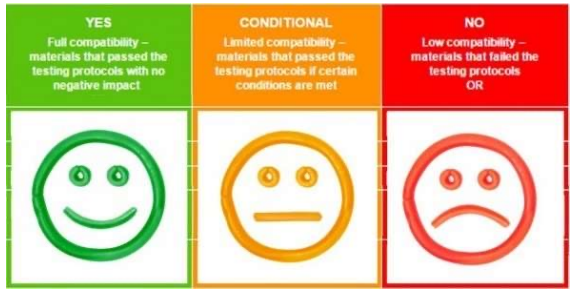
Petcore Europe Working Groups

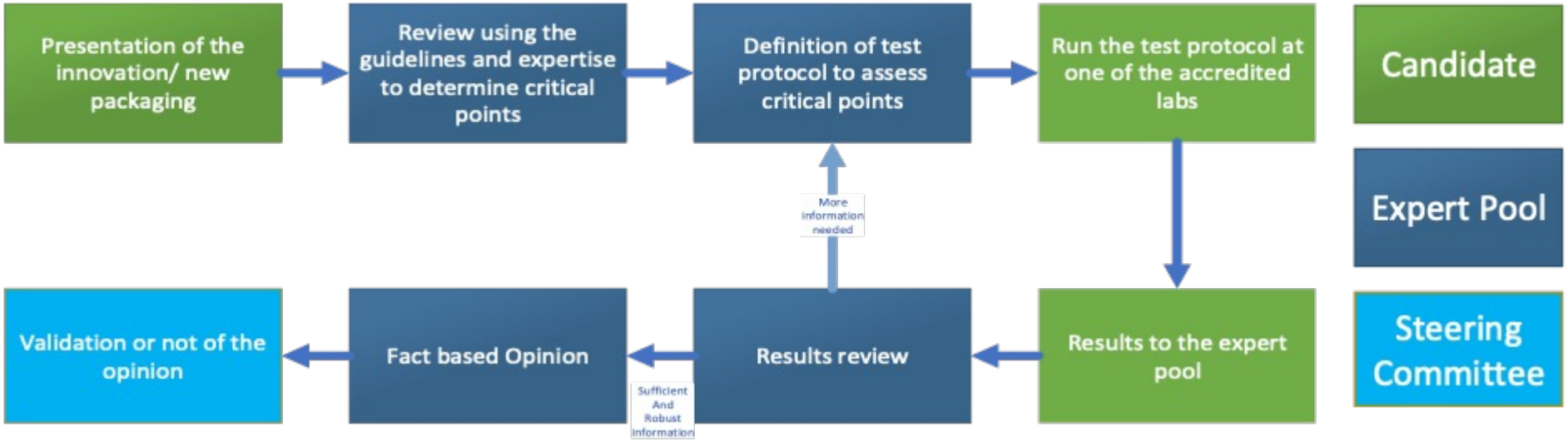
Trays Circularity Evaluation Platform (TCEP)

- Established in 2021
- The mission of the platform is to give support to the value chain of thermoformed PET trays to improve recyclability of thermoforms and strive to circularity.
- The Platform consists of technical experts in the field of PET thermoforms design, production and recycling.
- The objective is the evaluation of the impact on the PET recycling processes across Europe, of existing technologies and/or innovative solutions to provide an independent and confidential assessment, based on Petcore own protocols.
- Where to find information about TCEP platform:
  https://www.tcep-europe.org/page/23/modus-operandi-and-testing-procedures
  https://www.petcore-europe.org/recyclability-evaluation-platforms.html

Tray Circularity Evaluation Platforms (TCEP)

The Tray Circularity Evaluation Platform (TCEP) is an European industry initiative that provides PET thermoforms design guidelines for recycling, evaluates thermoform packaging solutions and technologies, and facilitates understanding of the effects of new PET thermoforms innovations on recycling process. The TCEP initiative fully supports the economic and Environmental sustainability of the European PET value chain.





TCEP Evaluation example. BOPET Lidding film.

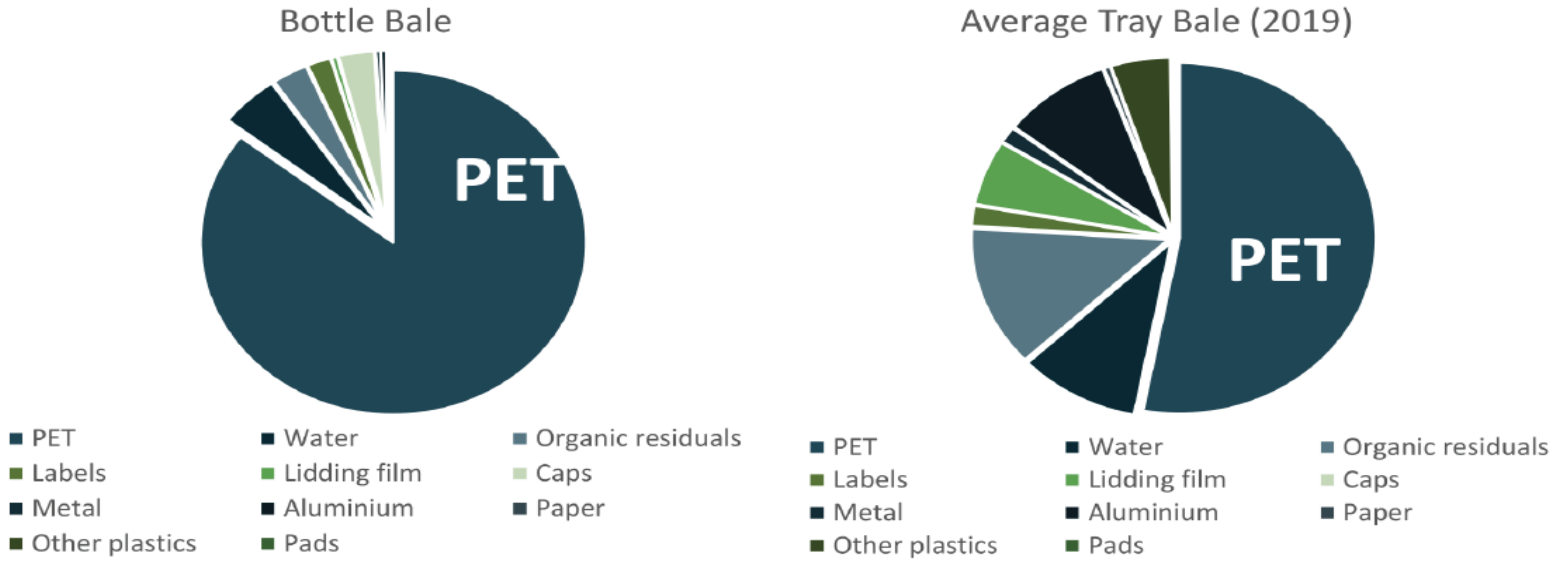
Feedstock composition is crucial

High-quality raw materials are crucial for mechanical recycling, but also for monomer recycling.

It is therefore important to reduce the contaminants in the PET tray stream.

This improve sorting and reduce the risk of contamination by other polymers that could affect rPET quality and hinder reprocessing

Mono PET lidding is a condition for improving the quality of the flow of mono PET trays.



TCEP Evaluation example

Variety of sealing layers

Sealing layers may be of different chemical composition

Variety of PET films heat sealable layers for produce, ready meal and protein market segments :

- BOPET films offline coated with Co-polyester
- Co-extruded BOPET films with peelable sealing layer
- Co-extruded BOPET films with permanent sealing layer

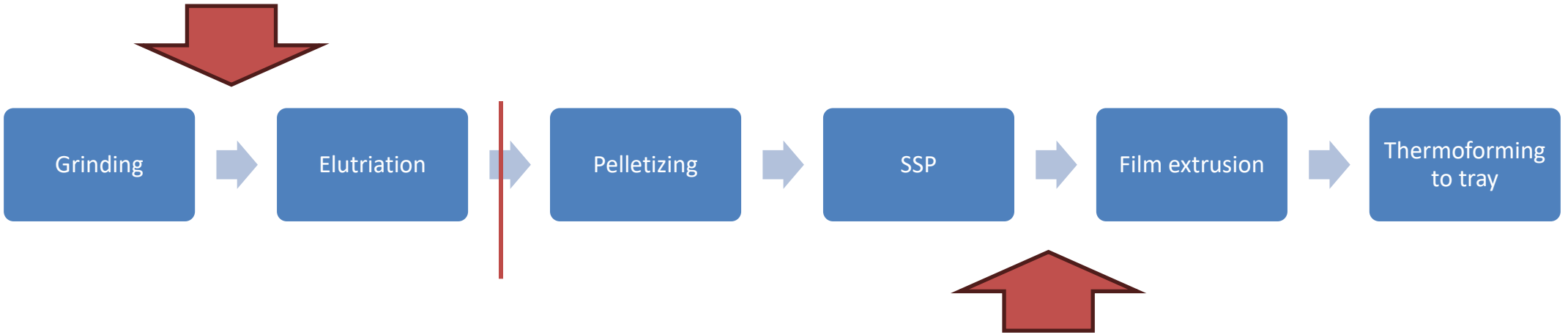
- Evaluation of recyclability of sealing layer has to be made to determine the influence of the layers on rPET quality output

- TCEP protocol allows a quick evaluation of recyclability of various sealing layer formulations

Evaluation through TCEP protocol

- Evaluation of separation with NTCP under industrial conditions to determine incorporation percentage

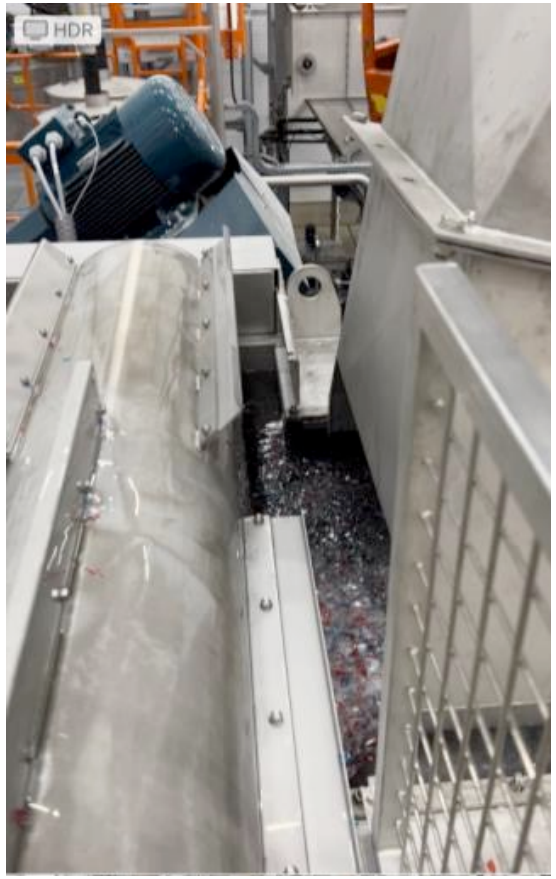
SEPARATION PHASE



PELLETIZING /EXTRUSION PHASE

- Evaluate different structures using a shorter TCEP protocol

Separation Phase (with NTCP)



Size reduction, Density separation Float/Sink, Air elutriation ZigZag

Evaluation based on facts

The TCEP test protocol is the perfect tool for evaluating of different mono polyester lids and their influence on different steps of recycling sorting, treatment/washing, extrusion and conversion as well of criticalities on RPET quality such as :

- Processability
- Color / haze / inclusion (black spec, fish eyes)

Increasing share of mono PET is possible

- BOPET have shown their recyclability with APET trays
- Today it is the pack format of choice across Europe for produces and ready meals
- Thanks to innovative coating and coextrusion today vast majority of protein application can be transitioned to mono PET.

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Functional Barrier Consortium

- Established in 2022 to act as technology developer under EU 2022/1616
- 60 companies are part of the Consortium sponsored by Petcore and EuPC.

Deliverables

- Provide Technical documentation and dossiers to support food safety of the use of rPET behind a functional barrier
- Deploy a monitoring program to comply with the regulation
- Maintain continuous dialogue with members and authorities

Most recent activities

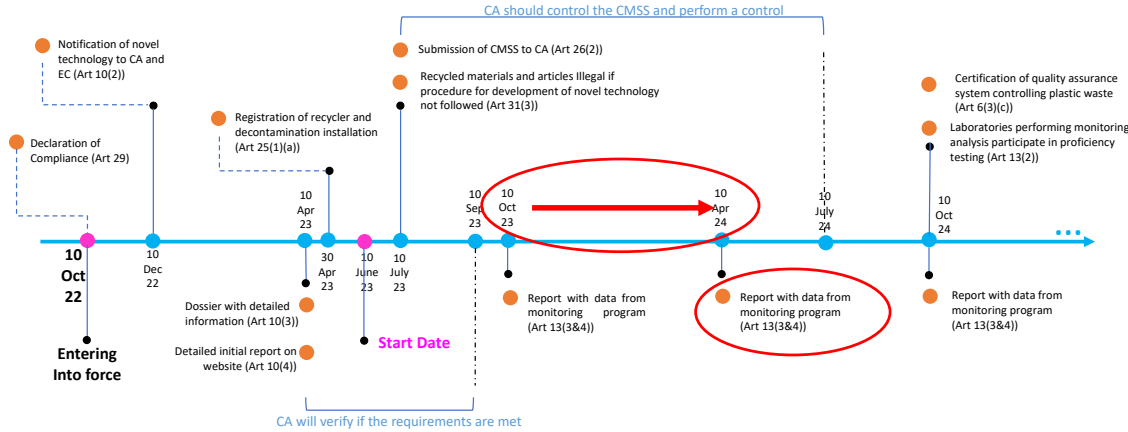
- Main dossier presented on time on April 10th. 2023
- First monitoring Report delivered on time on October 10th 2023..
- Regular General follow up assemblies
- Monitoring Protocols and procedures In place.
- Sampling plan developed together with the KÖR labs platform

Functional Barrier Consortium

- A recycler operating a decontamination installation in accordance with Article 11 shall monitor the average contamination level on the basis of a **robust sampling strategy** which samples the plastic **input batches and the corresponding decontaminated output batches**. The sampling strategy shall take account of all factors potentially affecting the composition of the plastic input, and particularly address variations in the origin thereof, whether geographic or otherwise.
- Recyclers shall provide the developer at least **every 6 months** with the data **forthcoming from the monitoring** and their updated reasoning in accordance with Article 12 (3)(f) if that has changed on the basis of the data.
- The **sampling frequency shall in any case be maintained at a suitable level** to detect trends and/or other changes in the contamination levels of the input batches, and to identify whether the presence of contaminants is reoccurring.
- By derogation to Article 13(1), recyclers operating decontamination installations notified by the same developer may agree to monitor the contamination levels in **only a third of the installations** included in the list provided in accordance with point (i) of paragraph 1, provided that the installations where the monitoring is carried out are designated on that list, monitoring is carried out at all recycling facilities, and the robustness of the overall sampling strategy is not reduced.
- For the analyses and tests required to determine the contamination level in accordance with paragraph 1, laboratories performing these activities shall take part **regularly and with satisfactory performance in proficiency tests** appropriate for this purpose. The first time a laboratory participates in such a proficiency test shall be before the start of the operation of the recycling facility.

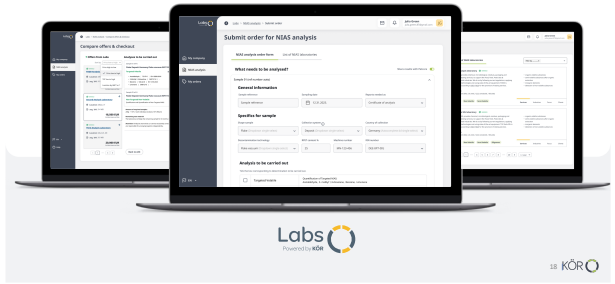
  Ensure traceability of each batch up to the point of the first sorting of collected plastic waste and be **certified by an independent third party.**

Operation of recycling installations that already manufactured recycled plastic M&A before 10 October 2022 and that operate under the novel technology route according to regulation (EU) No 2022/1616



CMSS = Compliance Monitoring Summary Sheet
CA = Competent Authority

Labs: Your testing platform.



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Tray to tray recycling: Myth or Reality ?

FINAL SUMMARY

- PET trays can be recycled and must be recycled
- Effort been made by the industry toward the circularity of PET trays
- There is still a long way to go:
  - Trays have to be collected
  - Trays have to be sorted
  - Tray recycling technology and capacity to be increased
  - Tray flakes have to go back to flakes.
- Packers and Retailers need to be convinced of the real circularity of PET packaging.

Tray to tray recycling: Mith or Reality ?

Q&A

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Dedicated Website - Annual Conference 2024:
www.petcoreeuropeannualconference.eu

Communications Campaign Website:
https://www.recycletheone.com/en

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