View of supply & demand towards 2025

How can we improve to be prepared?

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2 june 2021

PLASTICS RECYCLING INDUSTRY IN EUROPE

FACTS & FIGURES

PLASTICS RECYCLERS EUROPE

+600
COMPANIES

+20 000
EMPLOYEES

+6Mt
RECYCLED PLASTICS

+€3bn
TURNOVER

PRE's Projects & Cooperations

- EPBP: European PET Bottle Platform
  - Assessment system for innovative PET bottle designs
  - Facilitate more BtB applications.
- EuCertPlast
  - Create harmonisation in the certification of Recycler
  - Improve traceability of PCW Recycled materials
- RecyClass
  - What needs to be done to improve product designs
- PETCORE Europe
  - Facilitate cooperation within the PET value chain
- Plastics Recycling Show
  - Exhibition and conference dedicated to plastics recycling

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AGENDA FOR TODAY

- **What has changed in 1 year?**

- **What are the growth issues for targets 2025?**
  - Feedstock, Quality, Capacities

- **What are key market developments?**
  - Legal, quality, technology

- **Conclusions for development**

2020 silde; What are questions PRE still have?

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- Questions of PRE for PET Value Chain:
  - How will the rPET bottle market development in its total size until 2025? 100% remain or reduce? We have seen Unesda pledge 50% by 2025 and we saw increased 100% RPET launches
  - How many virgin capacity will be adapted to have rPET content? Some have increased Rpet content but remain below the 50%, some have accelerated acquisitions of Recyclers to make 100% RPET
  - Will there be changes in the colours of the bottles? No big changes, white still potential for growth
  - Can we expect the new deposits consortia's to be duplicated in other countries? Slow developments, balancing politics vs legal guidance to reach time targets
  - What is development speed of alternatives for 77% collection target until 2025? No major game changers
  - What is potential of non-deposit collection, can we secure the required quality for food grade? Missing standards reduce evaluation potentials
  - Can we expect harmonised EU standards for feedstock and applications in Foodgrade? Missing 282/2008 publication, delays transparency in the level playing field

PET | PLACED ON THE MARKET

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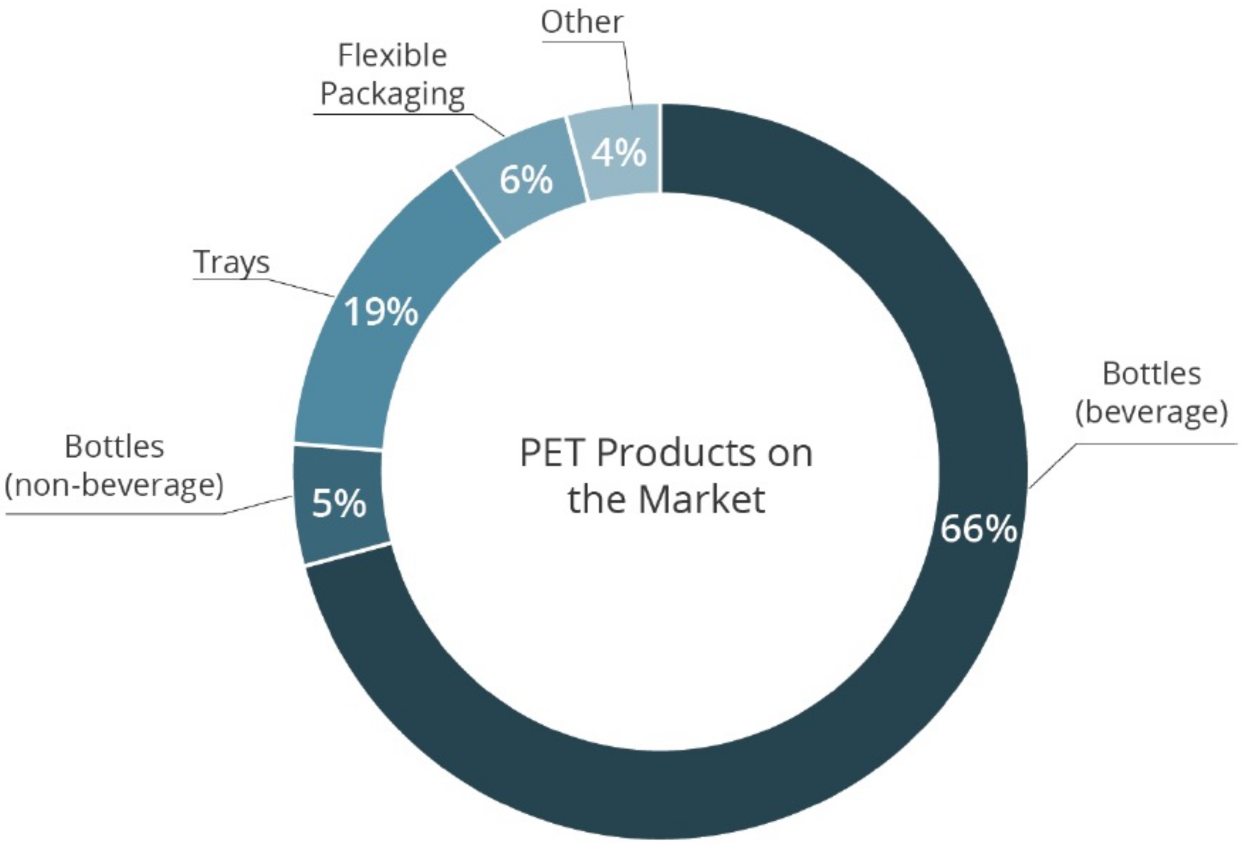

- 5.3Mt of PET is put on the market
- 96% is used in packaging (bottles, trays & flexible packaging)

- Trends:
- Bottle production to continue growing at a lower pace
- Trays consumption to grow

PET | COLLECTION & SORTING

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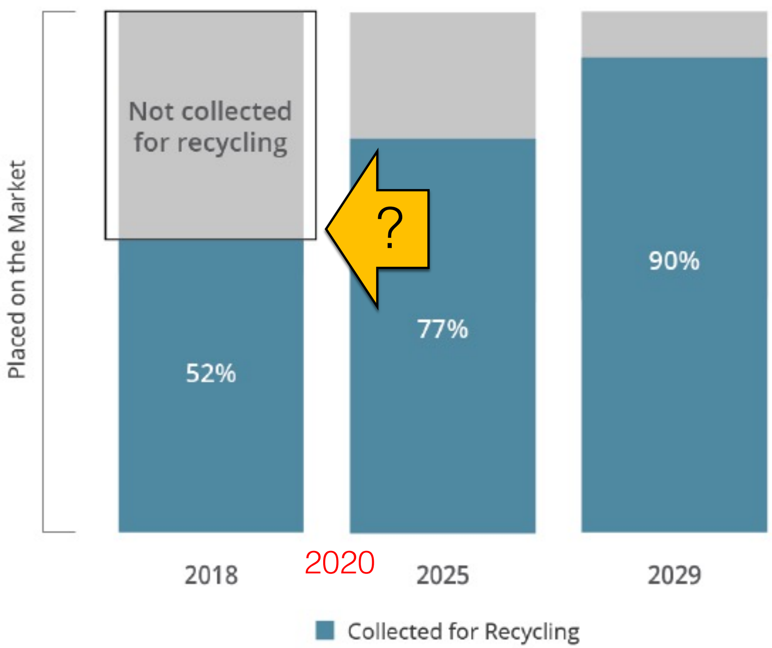
Covid effect -10%-15%

PET Bottles Collection Evolution



- 52% of PET bottles were collected for recycling
- 35% of bottles are collected via DRS
- Collection of trays is expected increase

- 77% collection target 2025 & 90% for 2029, for beverage bottles (SUPD)

- 10 MS have DRS in place
- 9 out of 10 existing countries with DRS have sorted for recycling rates of all PET bottles of over 83%

PET RECYCLING MARKET IN THE FUTURE?

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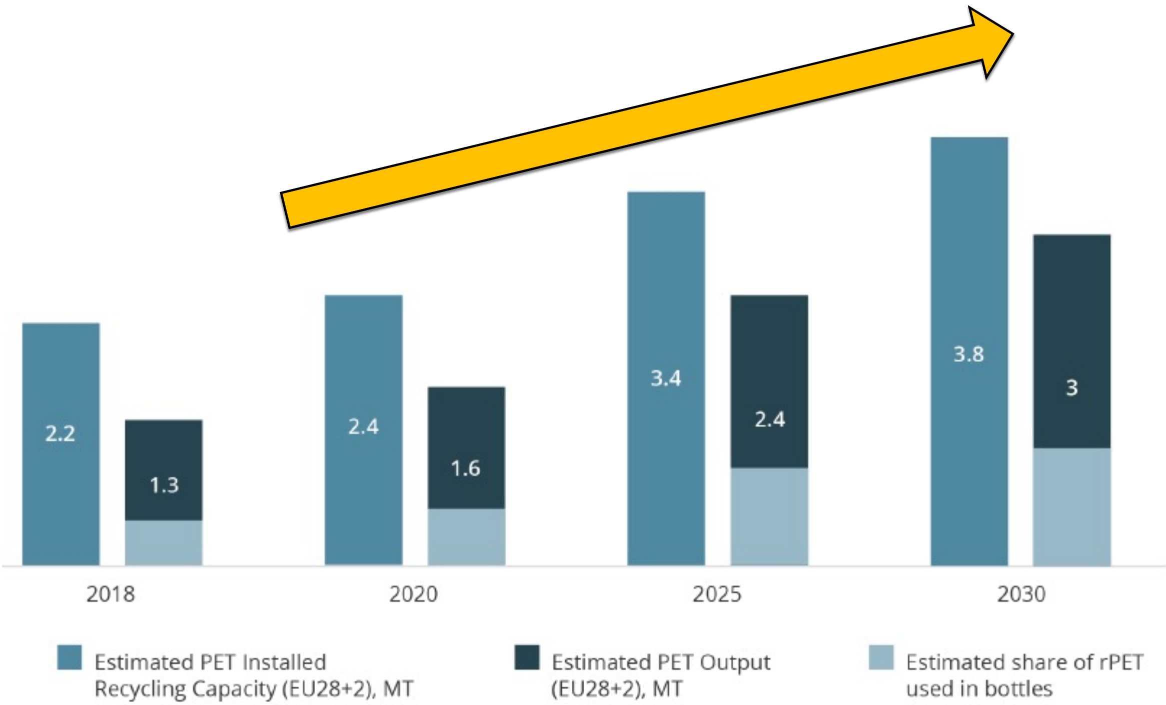
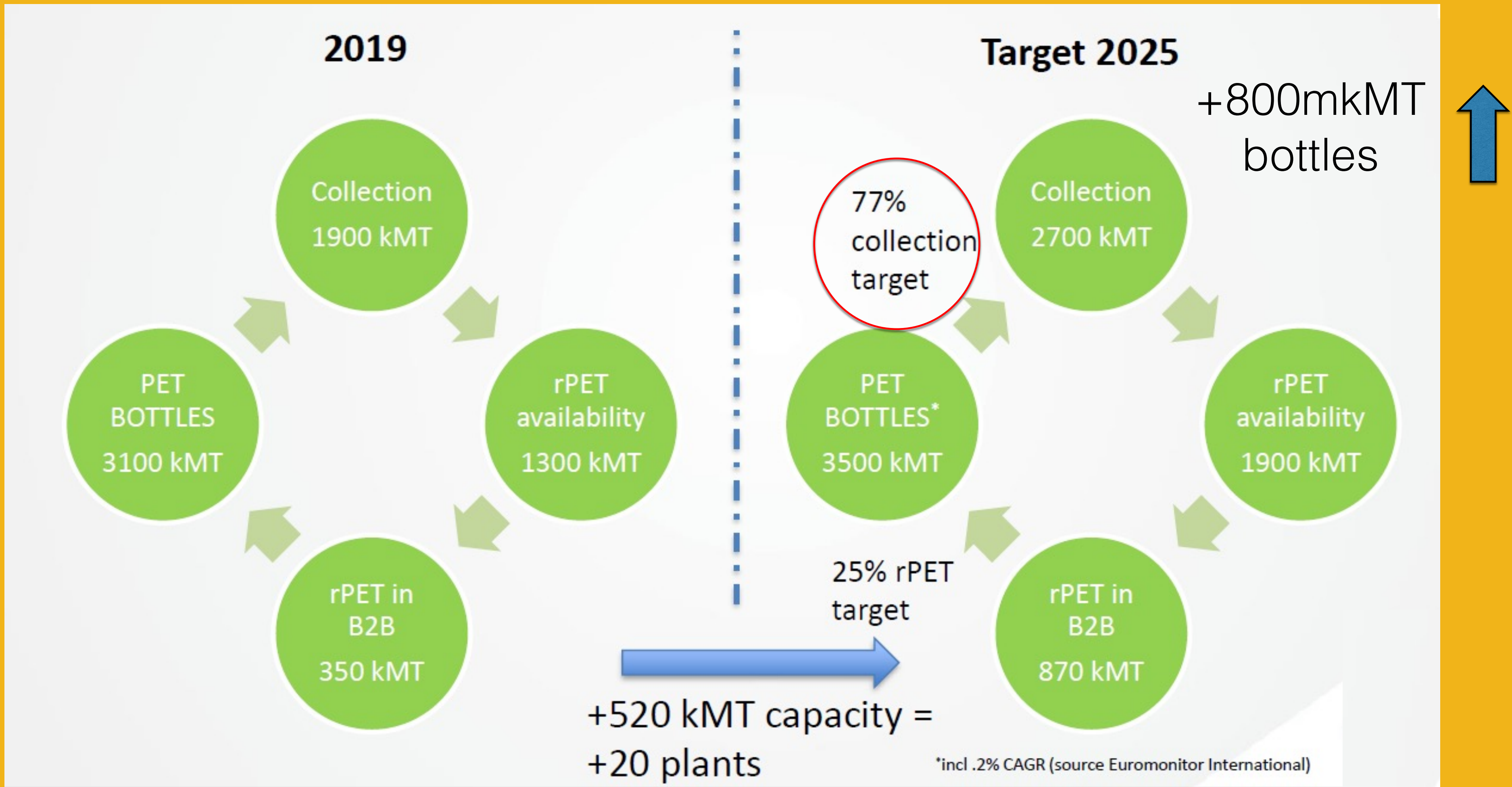
ↃRS growth in collection is major driving force



Joined study for 2020
data published oct 2021

Source PRE estimates 2020

2025 RPET requirements for FOOD bottles; 520 kMT dedicated



What is the current status of rPET?

Countries including a deposit system

Happy to see deadlines for new DRS to start

But more happy when they start!

Source: Plastics Recyclers Europe 2021

Capacity planning in the value chain

Chain reaction starts after new DRS garantees its collection effects

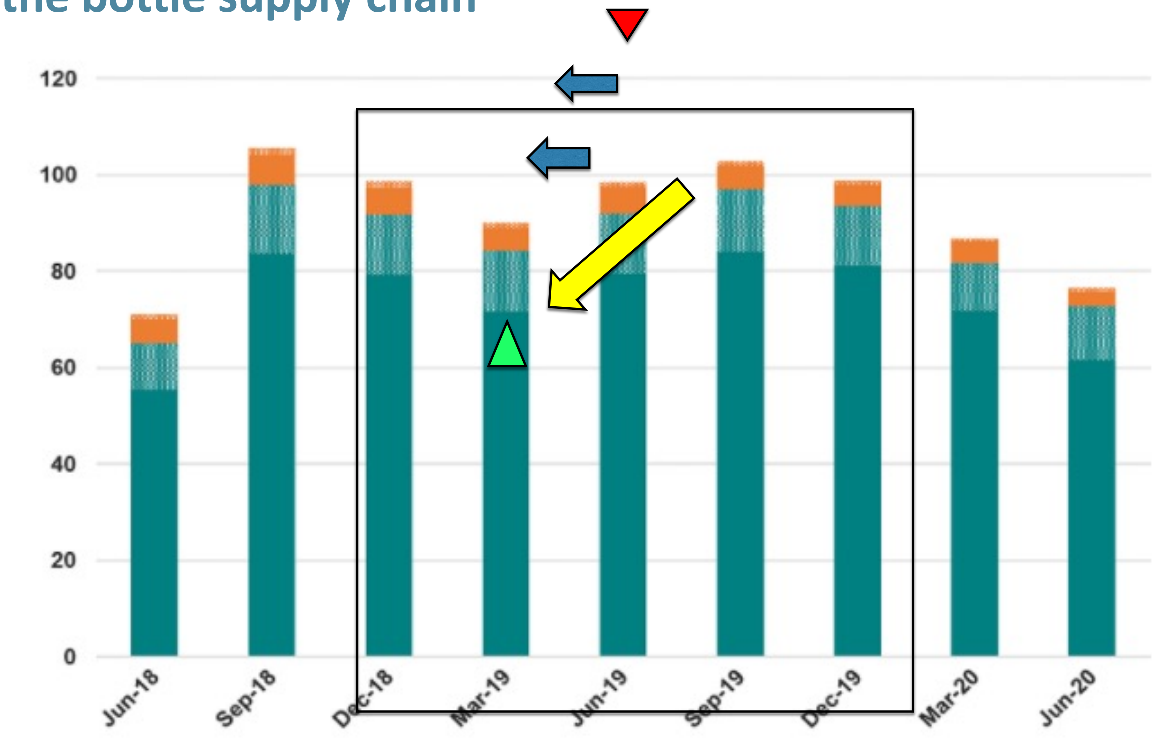
examples to show country specifics

	timing	Legal drivers	system investment	investment effect(very country dependant)	Country 1	Country 2	Country 3
collection	1.5-3 y	very strong	very high	multiple sorting lines multiple washing lines(consumption related)	1	1	1
sorting	1.5-3 y	definition input volume	high	multiple washlines if centralised	4	6	2
washing	1.5- 2 y	sorting standards defintion input	high	multiple pelletising lines	2	4	1
Pelletising	1-1.5 y	foodgrade law application specifics	medium high	multiple customers	6	6	3

Germany

Capacity planning in the value chain

Seasonality of the bottle supply chain



Collection> Recycling

Sales>

Preforms< Filling

Rpet

Quality development of rPET Requirements

Mineral water vs Other Qualities

- Mineral water have slidely higher requirements.
- 100% rPET solutions also for mineral water are currently available by mechanical recycling
- 2025 Target remains at 25% rPET content for mineral and softdrink bottles.
- Lighthouses of 100% applications prove the concept of circularity and are signal in time to confirm the concept

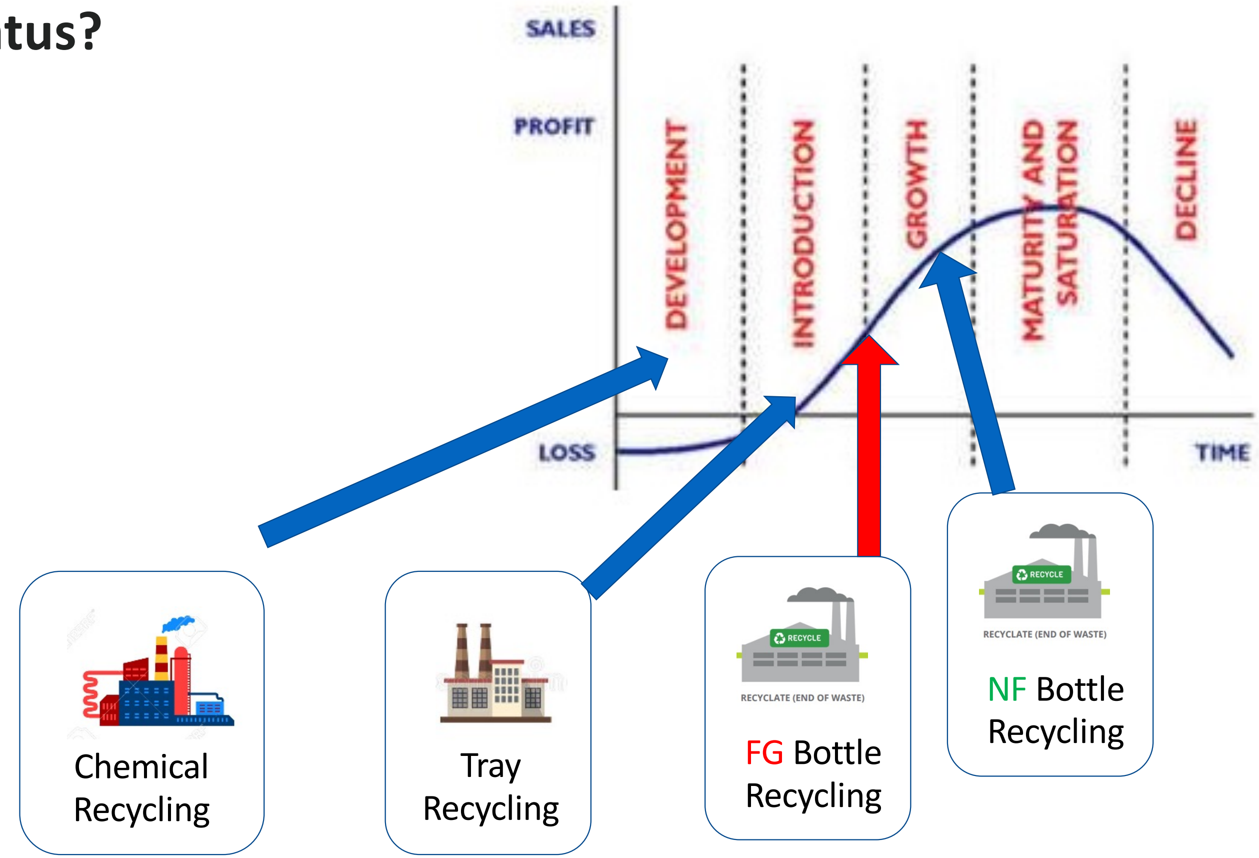
Quality development of rPET Requirements

Mineral water vs Other Qualities

- Clear standardisation of rPET quality requirements will help the value chain to set priorities in managing the 2025 target for 25%.
- All bottles can have different % of rPET towards 2025
- Main challange; **which route or % rPET will drive our market**?
- How to secure the quality for this market?
- Development of collection systems, fees, taxes, technologies needs more guidance.
- The standard of feedstock quality will clearly improve by more deposit introductions
- Lack of standardisation of feedstock of other collections will limit B2B developments

What is current status?

PLC for PET recycling



Mainly pelletising capacity increases

- Segmentation Food Grade vs Non Food Bottle recycling

What are key market developments?

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- **RPET Potential in 2025**
  - 1st limitation remains **collection**, deposit increase is needed in big countries
  - 2nd limitation is **quality** of collection
  - 3rd limitation is harmonisation direct food contact for recyclates (**regulation** 282/2008)
  - 4rd limitation lack of transpancy towards development on modulation of costs for collection & recycling

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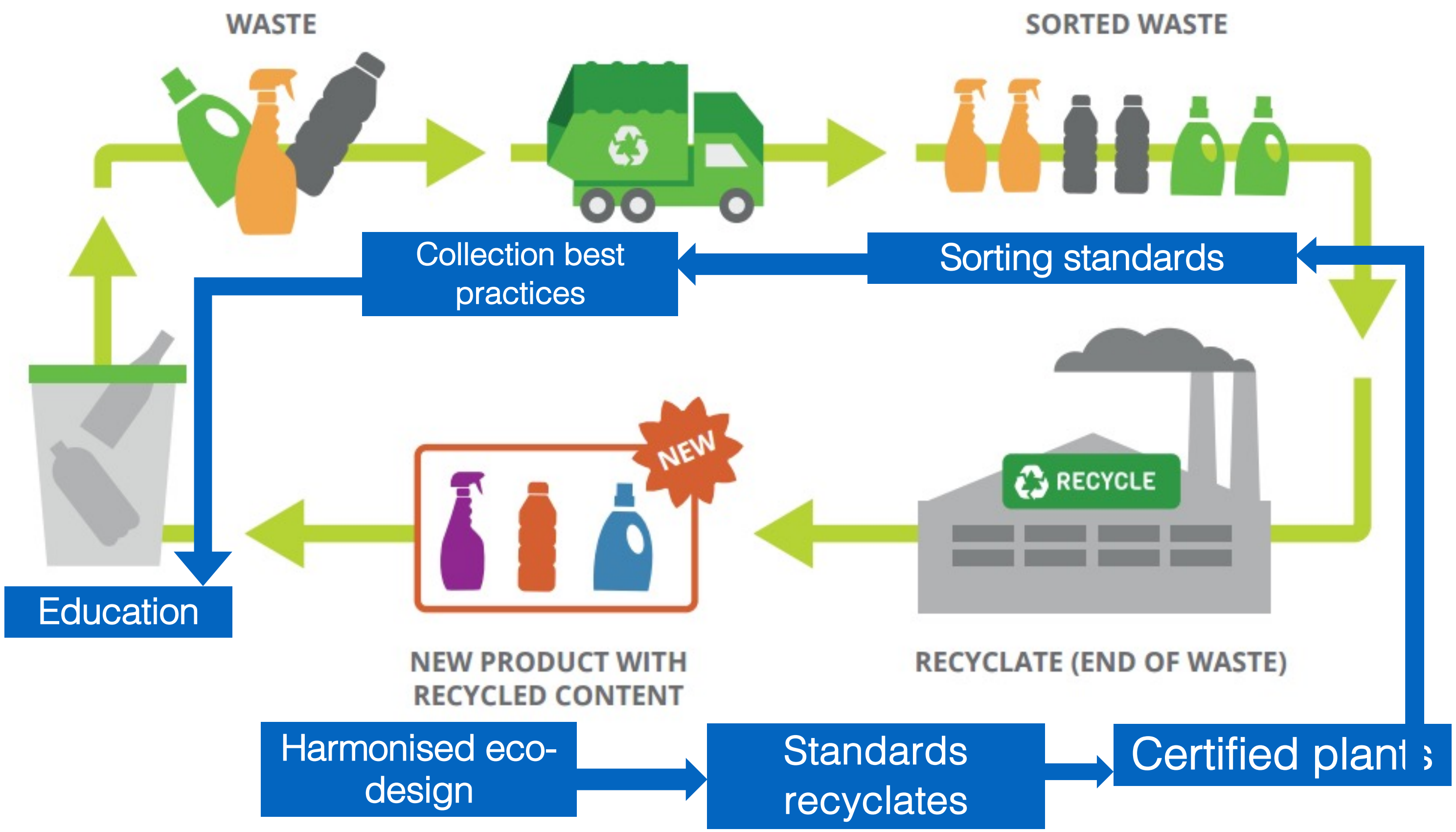
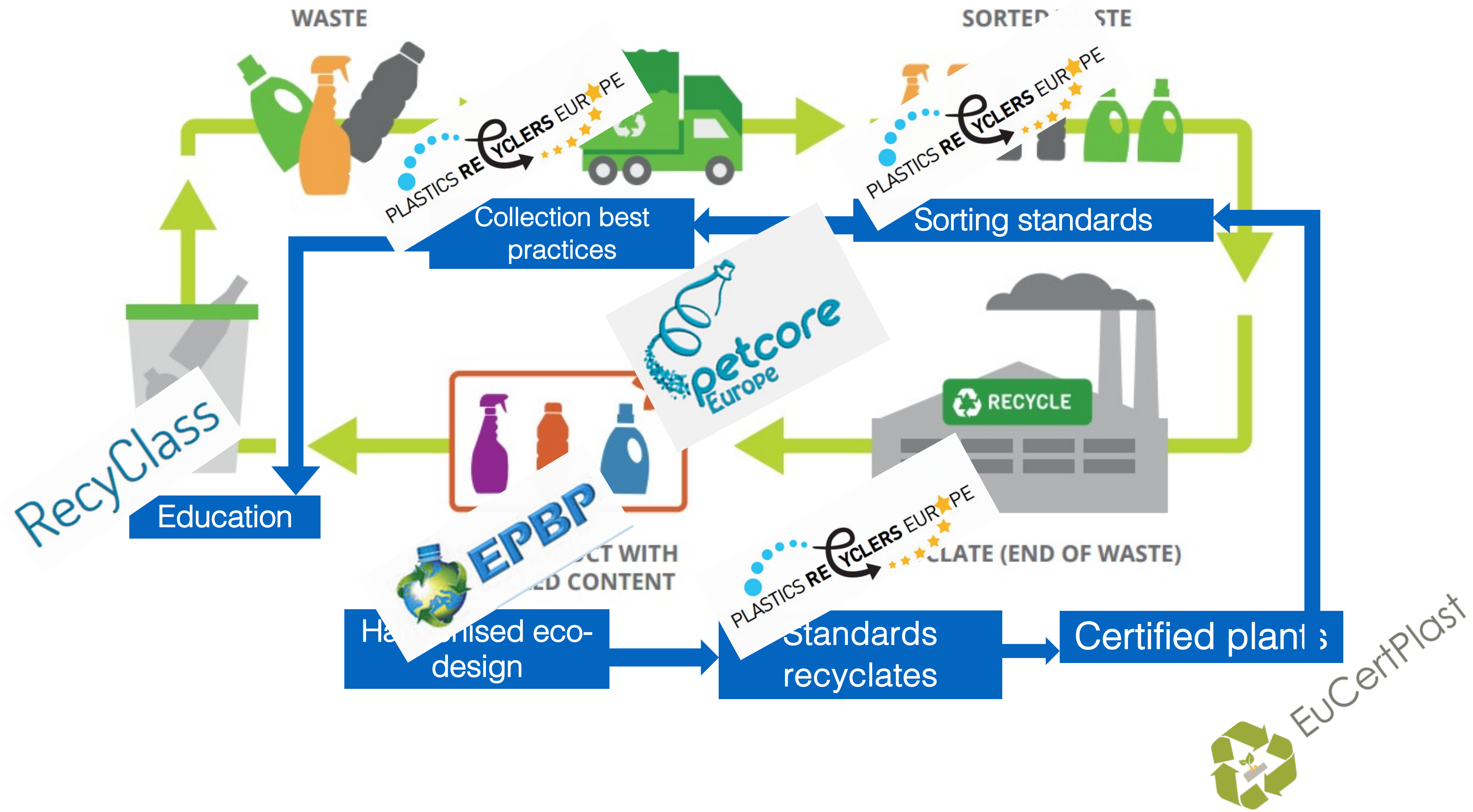
What are key market developments?

Plastics waste flow

Structure the plastics waste flow



Structure the plastics waste flow



What priorities we know today?

Major changes

- Secure the design for recycling
- Adaption of infrastructure to increase Bottle collection
- Use maximum value of collected PET to program new business models to finance the higher targets
- New recycling capacities needs to adapted to future collection qualities

What are key market developments?

How to prepare for 2025 targets?

- **Collection expansions** are uncertain in its timing. Supply side is slow due to required infrastructure in collection and processing. Delivery times of RPET wash plants are close to 12months. Good order books for 2020 and 2021 have brought respectable increase wash capacity but its feedstock is lagging behind.

- **Markers/tracers** can be found to programme its road to value, also infrastructure driven. Artificial Intelligence picks up to help. Can we upgrade sufficient non deposit to required Quality levels?

- **Both** are required to foster the high targets of 25% rPET content or more

What are questions PRE still have?

- Questions of PRE for PET Value Chain:
  - How will the rPET bottle market development as material becomes more tight in next years?
  - Remains the concept of deposits consortia's still a local puzzle to get started?
  - Is the publication of 282/2008 creating a better level playing field for PET value chain?
  - Are legal RPET requirements based on more local longterm commitments or is global supply/demand needed?
  - How is the chain of custody developing to prove the required quota?
  - What is the effect of the EU tax on the difference collection systems and packaging concepts?
  - Can we expect harmonised EU standards for feedstock and applications in Foodgrade?

Conclusions for development

- Covid didn't change the Circularity targets, we have a clear path to follow for 2025
- PET bottle Collection is main development which needs to improve in reaching 77% collection target in 2025.
- Start of New DRS counties are key to initiate new capacity expansions in RPET
- >500 kMT dedicated Bottle to bottle rPET capacity is required to meet targets.
- Expansions need to be programmed per country in various part of the value chain
- Standards are needed both feedstock & rPET for Mineral water or Softdrinks
- PRE is interested in further cooperation to develop the priorities we know today.
- PRE is reaching out to find the best answers to the questions we have today
- There is a positive Value in PET if the design is good, this helps in financing to create these new collection sustainable infrastructures.

Last question:

- Do you want PET to remain Nr 1 in circularity?

Please share your plan of action,

so we can to it together

Thank you for your attention!

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Thank you

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