Webinar with Delara Burkhardt (MEP, S&D) and the German Environment Agency

How to make packaging more recyclable

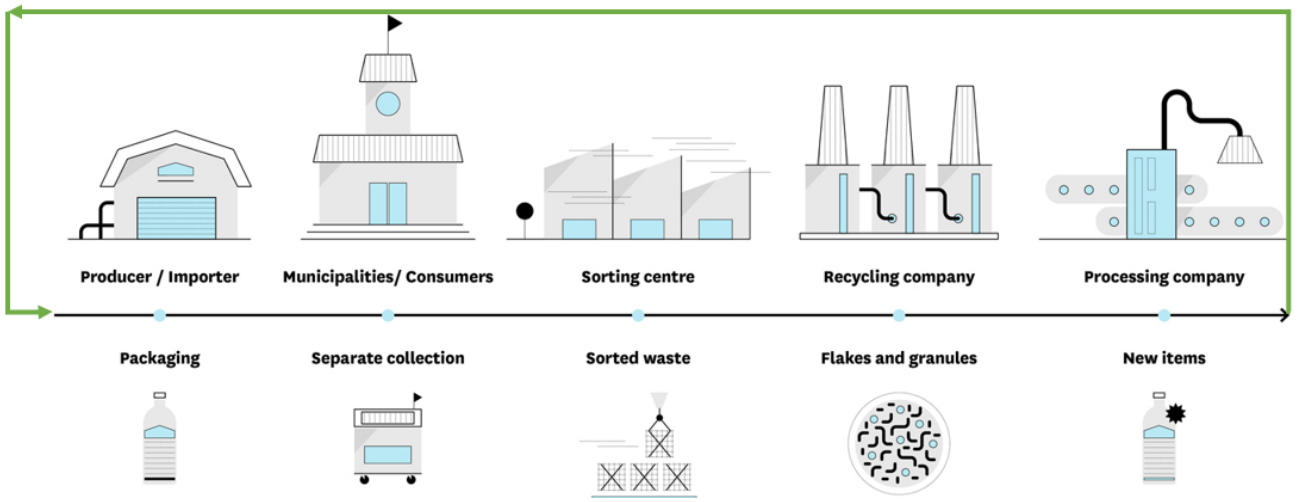
S&D DELARA BURKHARDT
Mitglied des Europäischen Parlaments

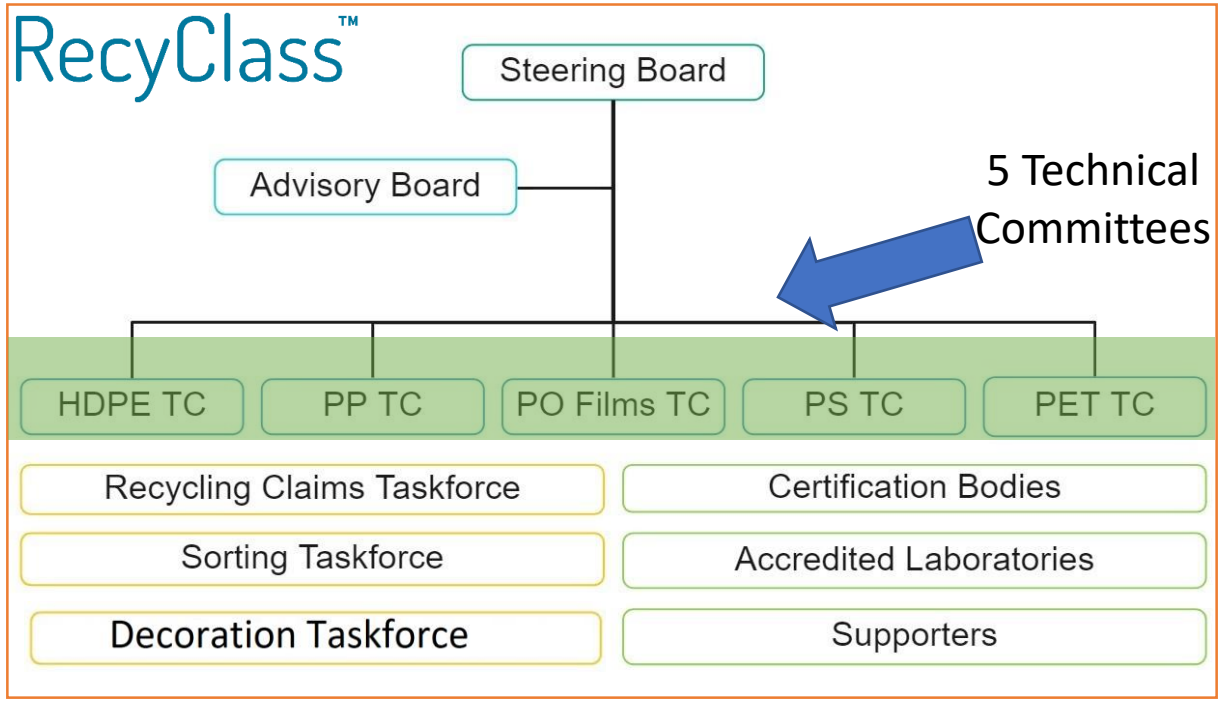
Umwelt Bundesamt

Overview: Differences in sorting and recycling in Europe

Paolo Glerean
paolo.glerean@aliplastspa.it

Recycling is possible only if the supply chain exists





RecyClass members (50)

P&G, Danone, Unilever, PepsiCo, Mondelēz International, Lavazza, L'Oréal, Ferrero, Henkel, gsk, essity, Edgewell Personal Care, Colgate-Palmolive, Kao, Orkla, Constantia Flexibles, Berry, amcor, Sealed Air, Neopac The Tube, Milliken, Taghleef Industries, saes coated films, Albéa packaging and more, Huhtamaki, Gualapack, essel Deutschland, Retal, IPV Pack, greiner packaging, Di Mauro flexible packaging, Silgan Dispensing, Lumson Cosmetic Packaging Industries, Guala dispensing, Bisio progetti, Avery Dennison, Bostik smart adhesives, UPM Raflatac, coim INKS, suez, Borealis Keep Discovering, Dow, Kurz, ExxonMobil, kuraray, Multi-Color Global Label Solution, Siegwerk, Yupo, SunChemical a member of the DIC group, Mitsubishi Chemical

The importance of harmonised and scientific-based information

- **<u>Harmonised Evaluation Protocols and Design Guidelines are essential</u>**
  - ✓ Strengthens and gives credibility to the message;
  - ✓ Provides for effective communication with stakeholders;
  - ✓ Provides clear direction for design for recyclability policies within brands.

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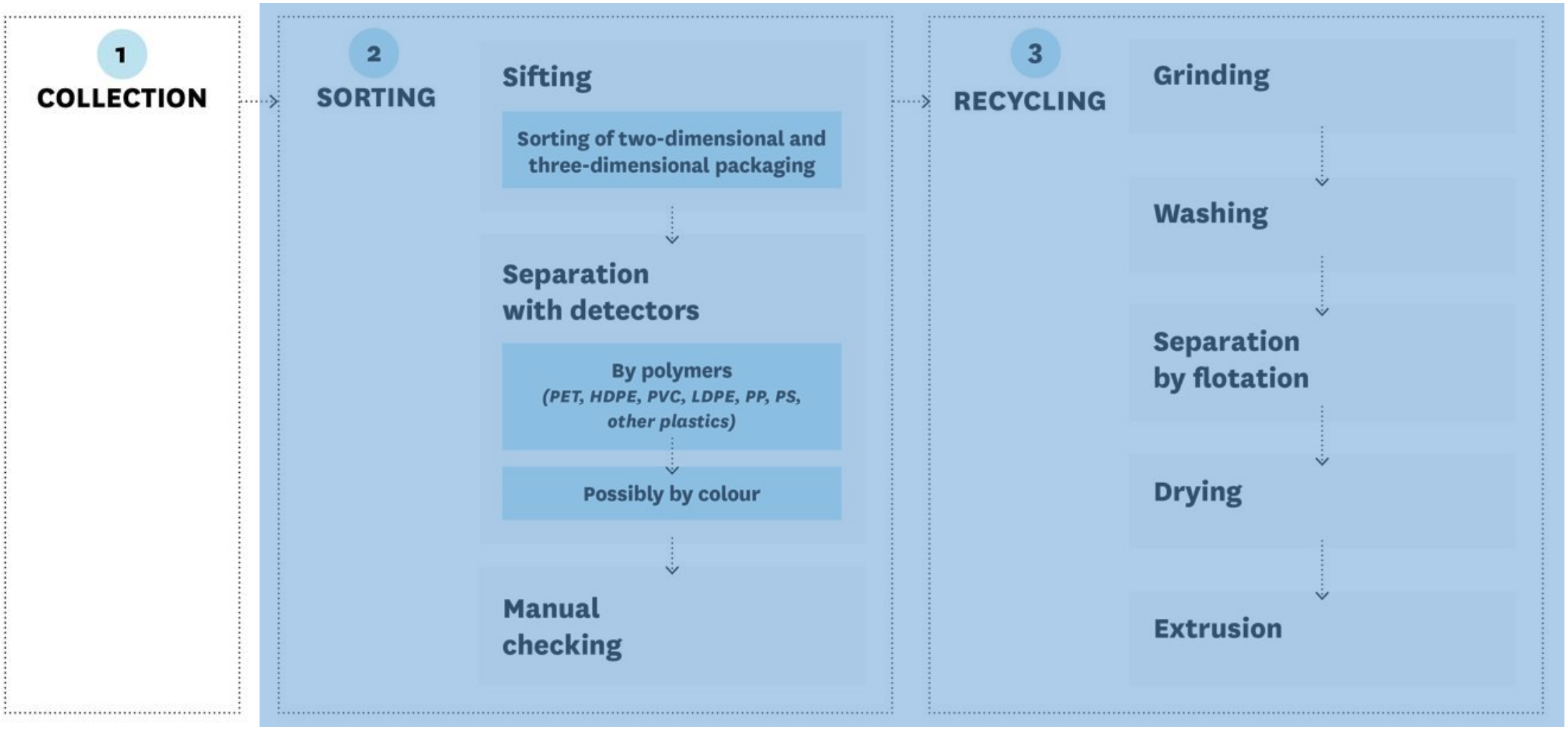
Illustrative diagram of an example of sorting and recycling process



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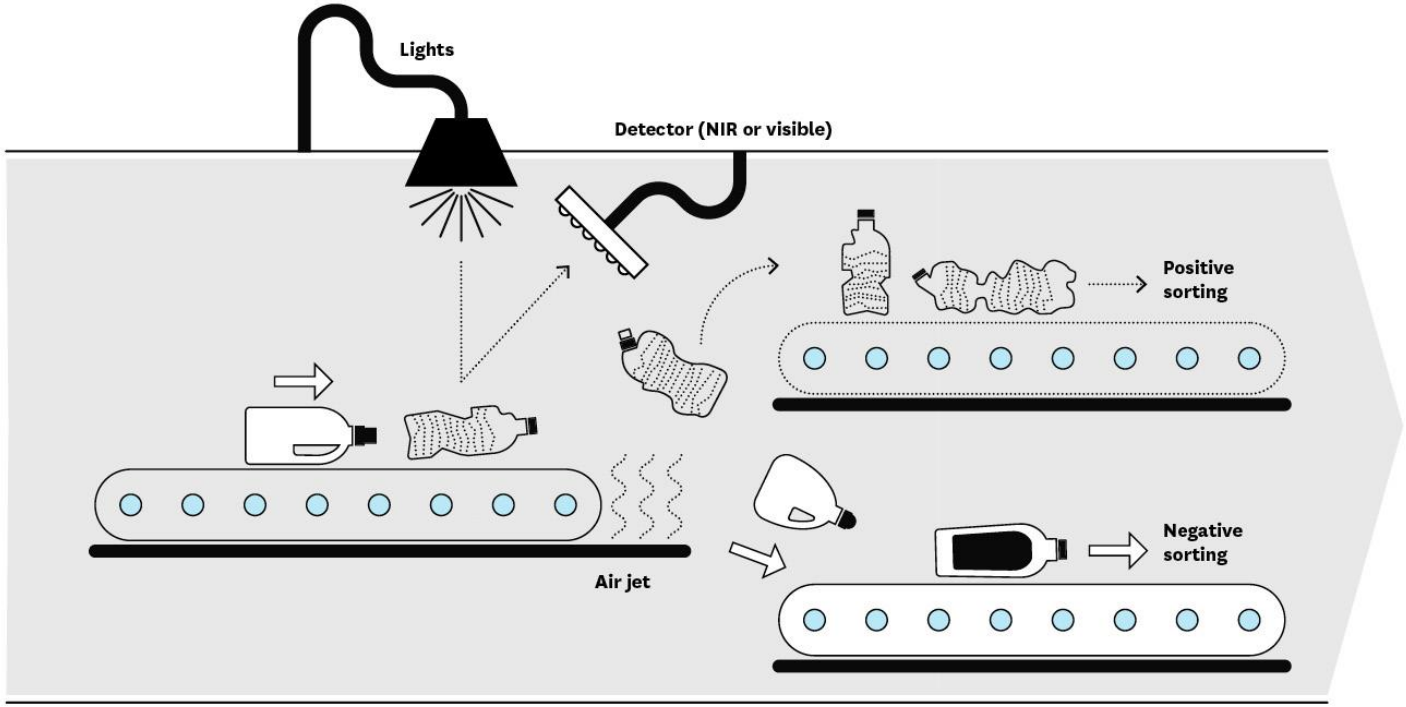
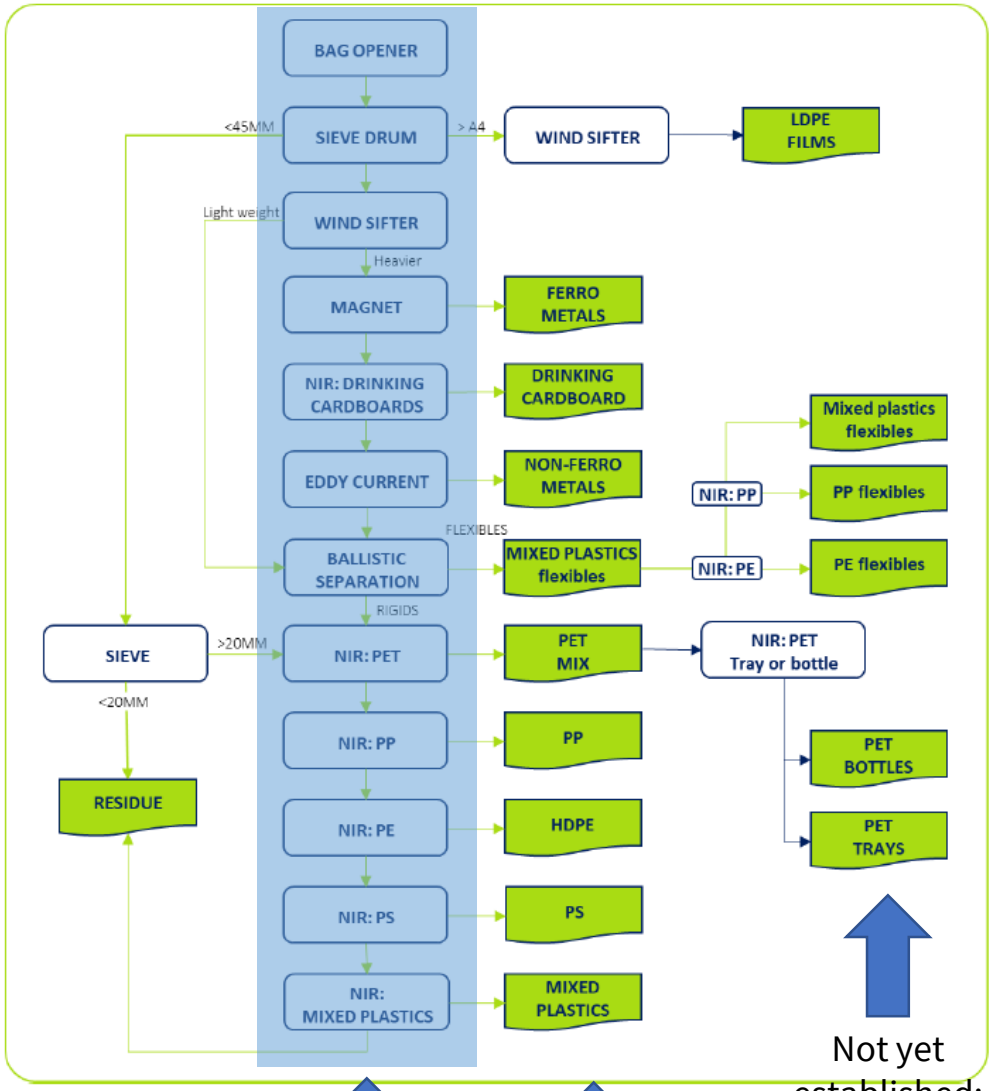
NIR-Sorting

Example of sorting process



RecyClass Sorting Protocol



Main steps

Main outputs

Not yet established: PET trays and PP films

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All the European sorting lines are based on similar design and on NIR detector technologies

Differences are mainly due to the different collection systems and sorted waste streams produced:

- Sieve drums: hole size is averaging 50x50 mm (Germany and The Netherlands are mainly 20x20 mm);
- Setting operational parameters, as function of the quality of waste received and sorted streams produced
- NIR detectors: sequence and numbers can differ line by line on the base of the waste collected, the quality of waste processed and the sorted waste streams produced.
- Output streams:

1) almost in all Countries sorting lines produce PET and HDPE streams;
2) in several Member States PET bottles are sorted in 2 streams (clear/light blue and coloured PET bottles);
3) In some Member States PP rigids, as well as PE flexibles are sorted separately.
4) In few Member States PET trays are sorted (often with bottles, only in France the ones lidding films are sorted separately from January 2021)
5) In some Member States, mixed polyolefin (flexibles) and mixed plastics (rigids) are sorted and recycled (injection molding applications)

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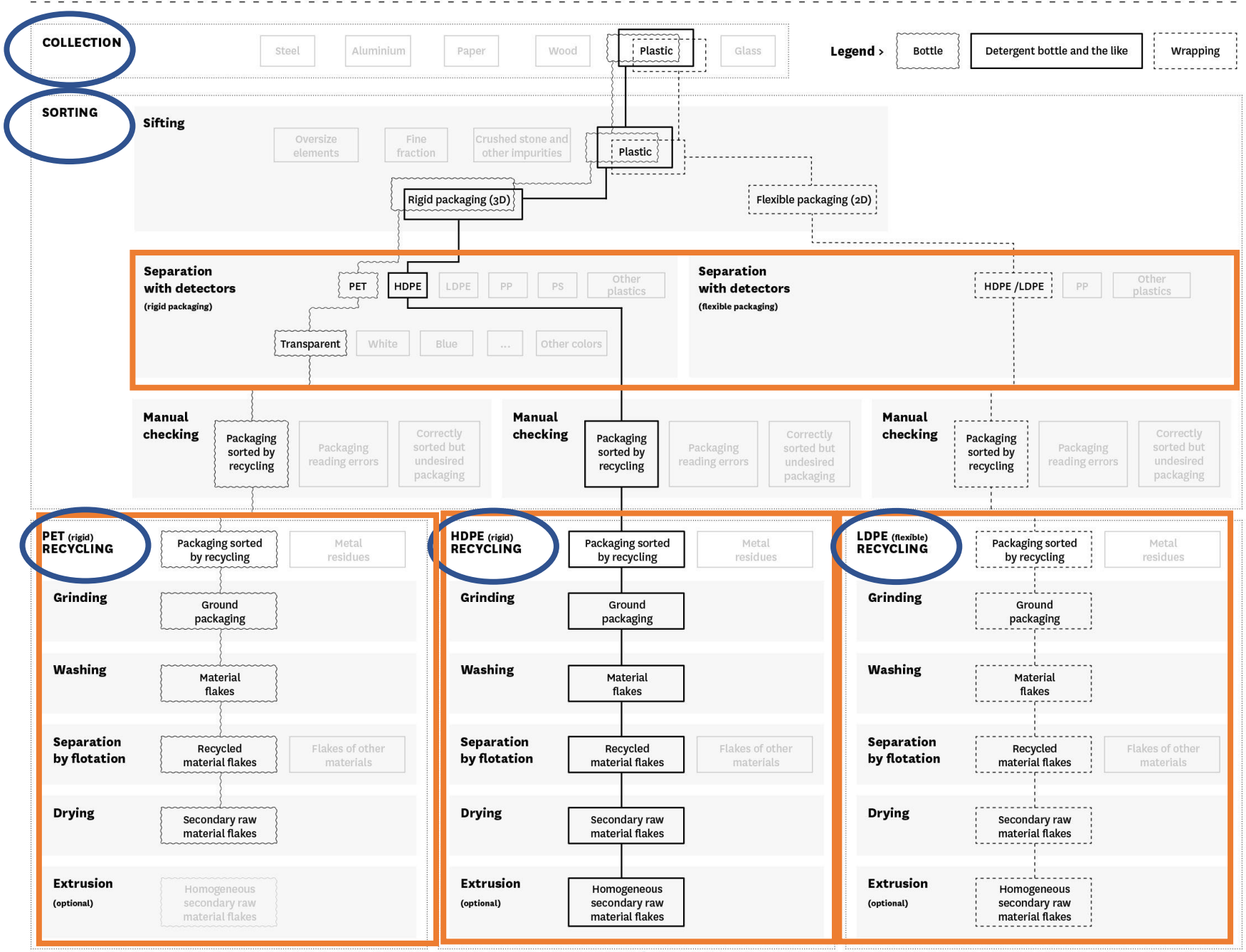
COLLECTION
Steel
Aluminium
Paper
Wood
Plastic
Glass
Legend >
Bottle
Detergent bottle and the like
Wrapping
SORTING
Sifting
Oversize elements
Fine fraction
Crushed stone and other impurities
Plastic
Rigid packaging (3D)
Flexible packaging (2D)
Separation with detectors
(rigid packaging)
PET
HDPE
LDPE
PP
PS
Other plastics
Transparent
White
Blue
...
Other colors
Separation with detectors
(flexible packaging)
HDPE /LDPE
PP
Other plastics
Manual checking
Packaging sorted by recycling
Packaging reading errors
Correctly sorted but undesired packaging
Manual checking
Packaging sorted by recycling
Packaging reading errors
Correctly sorted but undesired packaging
Manual checking
Packaging sorted by recycling
Packaging reading errors
Correctly sorted but undesired packaging
PET (rigid) RECYCLING
Packaging sorted by recycling
Metal residues
Grinding
Ground packaging
Washing
Material flakes
Separation by flotation
Recycled material flakes
Flakes of other materials
Drying
Secondary raw material flakes
Extrusion
(optional)
Homogeneous secondary raw material flakes
HDPE (rigid) RECYCLING
Packaging sorted by recycling
Metal residues
Grinding
Ground packaging
Washing
Material flakes
Separation by flotation
Recycled material flakes
Flakes of other materials
Drying
Secondary raw material flakes
Extrusion
(optional)
Homogeneous secondary raw material flakes
LDPE (flexible) RECYCLING
Packaging sorted by recycling
Metal residues
Grinding
Ground packaging
Washing
Material flakes
Separation by flotation
Recycled material flakes
Flakes of other materials
Drying
Secondary raw material flakes
Extrusion
(optional)
Homogeneous secondary raw material flakes

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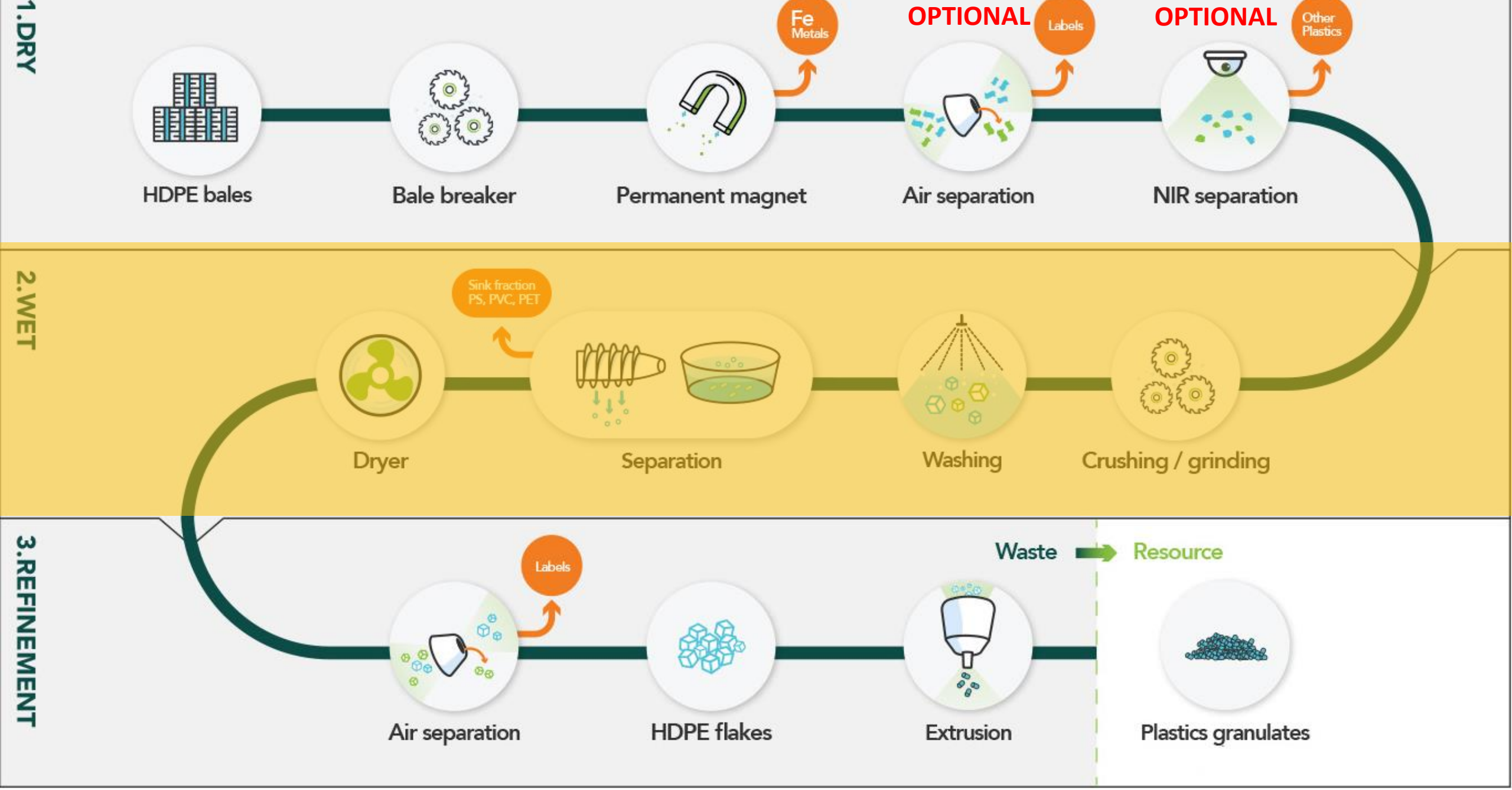
1.DRY
HDPE bales
Bale breaker
Permanent magnet
Fe
Metals
OPTIONAL
Labels
Air separation
OPTIONAL
Other
Plastics
NIR separation
2.WET
Dryer
Sink fraction
PS, PVC, PET
Separation
Washing
Crushing / grinding
3.REFINEMENT
Air separation
Labels
HDPE flakes
Extrusion
Waste
Resource
Plastics granulates

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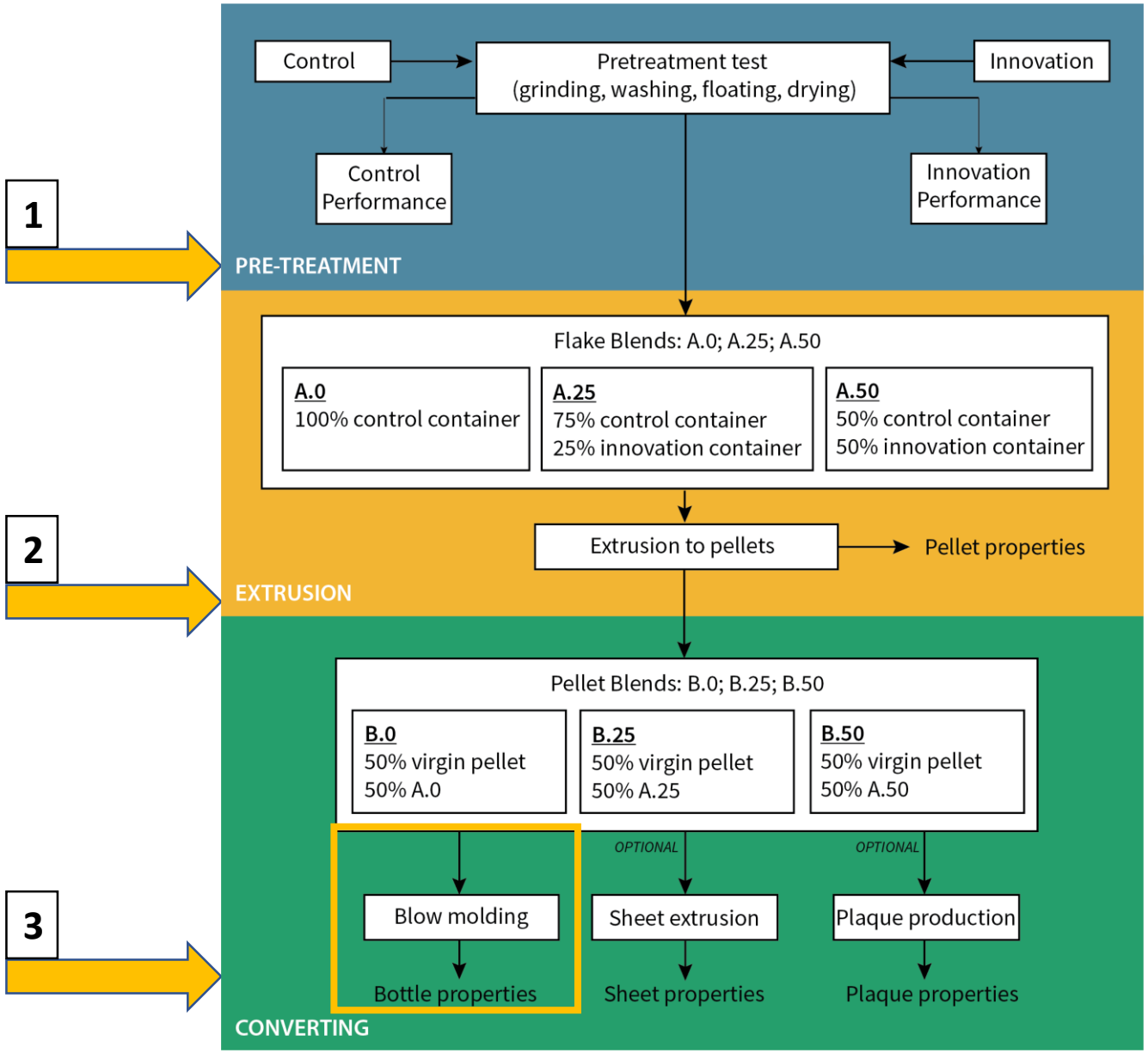
How assess recyclability in a standard way?



Recyclability Protocol for HDPE

- **Pre-treatments**

Input:
10 kg innovation
25 kg control

- **Extrusion and pellet characterization**

Input:
3 flake blends of control and innovation flakes (**with 0, 25% and 50% of innovation**)

- **Converting** (50% dilution with virgin)

Input:
3 pellet blends of control and innovation pellets (**with 0, 12,5% and 25% of innovation**)

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Thank you
for your attention

www.recyclass.eu

info@recyclass.eu

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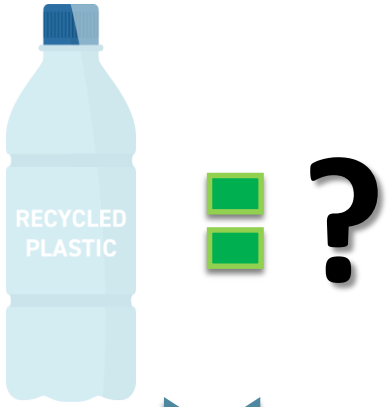
How does RecyClass work?

Recyclability Evaluation Protocols



- **Test** on recycled product with and without innovation.
- Comparison of properties
- **Technology/Product Approval**

Design for Recycling Guidelines

PE Transparent Flexible Films

RecyClass™	YES - FULL COMPATIBILITY A-B *	CONDITIONAL - LIMITED COMPATIBILITY B-C *	NO - LOW COMPATIBILITY D-E-F *
	Materials that passed the testing protocols with no negative impact OR materials that have not been tested (yet), but are known to be acceptable in PE recycling	Materials that passed the testing protocols if certain conditions are met OR materials that have not been tested (yet), but pose a low risk of interfering with PE recycling	Materials that failed the testing protocols OR materials that have not been tested (yet), but pose a high risk of interfering with PE recycling
Film	PE-LD, PE-LLD; PE-HD	multialyer PE/PP	any other polymer (ex. PET, PVC, etc.)
Colours	unpigmented; transparent	light colours; translucent colours	dark colours; black; carbon black
Barrier	barrier in the polymer matrix; SiOx and AlOx without additional coatings	< 5% EVOH (in polyolefinc combination film); metalized layers without coatings; EcoLam High Plus; VO+ LLDPE	> 5% EVOH (in polyolefinc combination film); barrier layer PVC, PVDC, PA; any other barrier layer; foaming agents used as expandant chemical agents; aluminium
Additives			Bio-/oxo-/photodegradable additives; additives concentration > 0,97 g/cm^3
Closure Systems	PE-LD, PE-LLD, PE-HD	PP, PET, PETG, PS, PLA	metal, aluminium, PVC, non PO or foams with density < 1 g/cm^3
Liners, Seals and Valves	PE-LD, PE-LLD, PE-HD	PP, PET, PETG, PS, PLA, removable aluminium fasteners	metal, aluminium, PVC, foiled paper; non PO or foams with density < 1 g/cm^3
Labels	PE	PP, paper labels without fiberloss	metallized labels, any other; paper labels with fibreloss
Adhesives for labels	Water soluble or water-releasable at less than 60°C		Adhesives non-soluble in water or non-releasable in water at less than 60°C
Inks	no inks	Non-toxic (according to EUPIA guidelines)	Inks that bleed; Toxic or hazardous inks.
Direct Printing	Laser marked print; Printed production or expiry date	printing covering < 50% **	printing covering > 50% **
Other Attachments	PE-LD, PE-LLD, PE-HD	PP , PET, PETG, PS, PLA	metal, aluminium, PVC, paper, foams with density < 1 g/cm^3

Last update - June 2020

* Class ranking resulting by the RecyClass assessment. B class is reported two times because of the 90-95% amount of PE in the packaging or because of slight incompatibilities in the design
** temporary solution

- The DfR Guidelines are transposed to the tool.
- The overall recyclability of the finished package can be assessed.

RecyClass Tool

- Recyclability Self-Assessment
- Recyclability Expert-checked
- **Recyclability Certification**

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