



RecyClass Unwrapped

Towards the EU recycling targets with RecyClass

Moderated by
Antonino Furfari | Managing Director | Plastics Recyclers
Europe

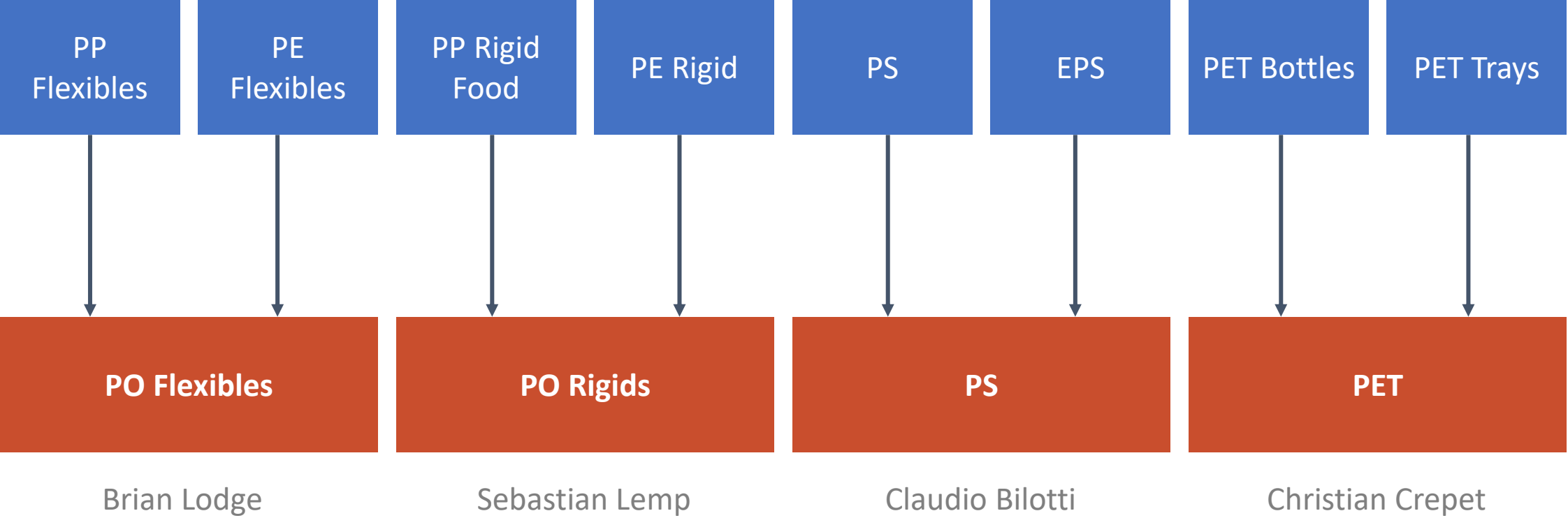
09 December 2021

RecyClass

CPA Dedicated Product Teams



CPA Dedicated Product Teams



CPA Dedicated Product Team

Our task:

To propose guidelines to DGGROW that can be used as the basis of establishing standards by CEN.

- Design guidelines and Evaluation process
- Sorted waste quality standards
- Quality of recycled materials
- Quality standards for recycled content

Priority streams:

A

Priority product designed to produce a recyclate suitable for recycled content in the same priority product

B

If the above is not reached, recyclate is suitable for recycled content in other priority products of the CPA

C

Design packaging not meeting stream A and B requirements to be separable



CPA DPT – PP Food Containers, Caps & Closures

Major challenges:

Mechanically recycled PP is not suitable for direct food contact applications (EFSA)

Very little recycled PP material available from chemical recycling

PP not as widely collected in Europe as other target materials

Caps & Closures are used on a wide variety of containers

Initial decisions

To enable the DPT to meet the needs of the CPA we agreed to change the remit

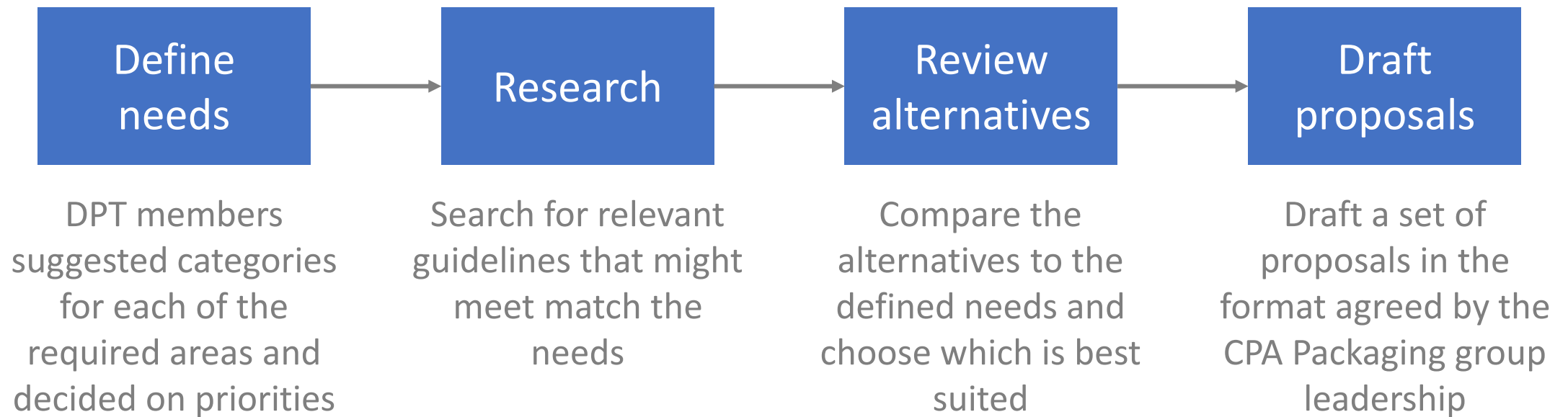
It was decided that recycling food packaging into non food packaging would be classified as being stream **A** as this is happening widely in the industry already and downgrading it to a **B** would be counter productive

As caps & closures are made of many different materials and can be used across many different packaging types it was agreed that each DTP would need to address them in their own group

Therefore the group changed to **PP Rigid Containers** and could also encompass many rigid PP packs that did not fall within the remit of any other DTP



CPA DPT – PP Rigid Containers



CPA DPT – PP Rigid Containers

Two documents were submitted to the CPA leadership in September:

- Packaging – Recyclability evaluation process for plastic packaging – Guidelines for PP Bottles and Containers
- Packaging – Design for Recycling of plastic packaging – Guideline for PP Bottles and Containers

These guidelines and evaluation processes were based on the RecyClass system and will now be put before the CEN committee as proposals for standardisation

As the work of the PP and PE groups reached the same conclusions it was agreed that these two DPTs should merge to reduce time and effort going forward



CPA DPT – PO Flexible Packaging

Major challenges:

Infrastructure for collecting and recycling flexible packaging is not as well developed as that for rigid

Many flexible plastics are complex laminates, highly decorated or contain additives which make them more difficult to recycle

Differences in opinion on how to proceed have delayed decision making within the DTP

CPA DPT – PO Flexible Packaging

Considerable work has been done comparing the CEFLEX and RecyClass classifications for flexible materials by a working group (set up jointly by the two organisations) – this has identified several areas where the guidelines differ

As the two organisations viewpoint is different the DTP is working on a way to frame their proposal to take both approaches into account

This has delayed the publication of the design guidelines and evaluation protocols



The background of the slide is a dense, close-up photograph of dark grey plastic pellets, which are small, cylindrical, and have a slightly textured surface. The pellets are piled together, creating a complex pattern of light and shadow.

Plastics recycling standardisation in Europe

RecyClass Unwrapped
9 December 2021

Circular Plastics Alliance and Standardisation Request

Ongoing in Europe, examples

Time overview

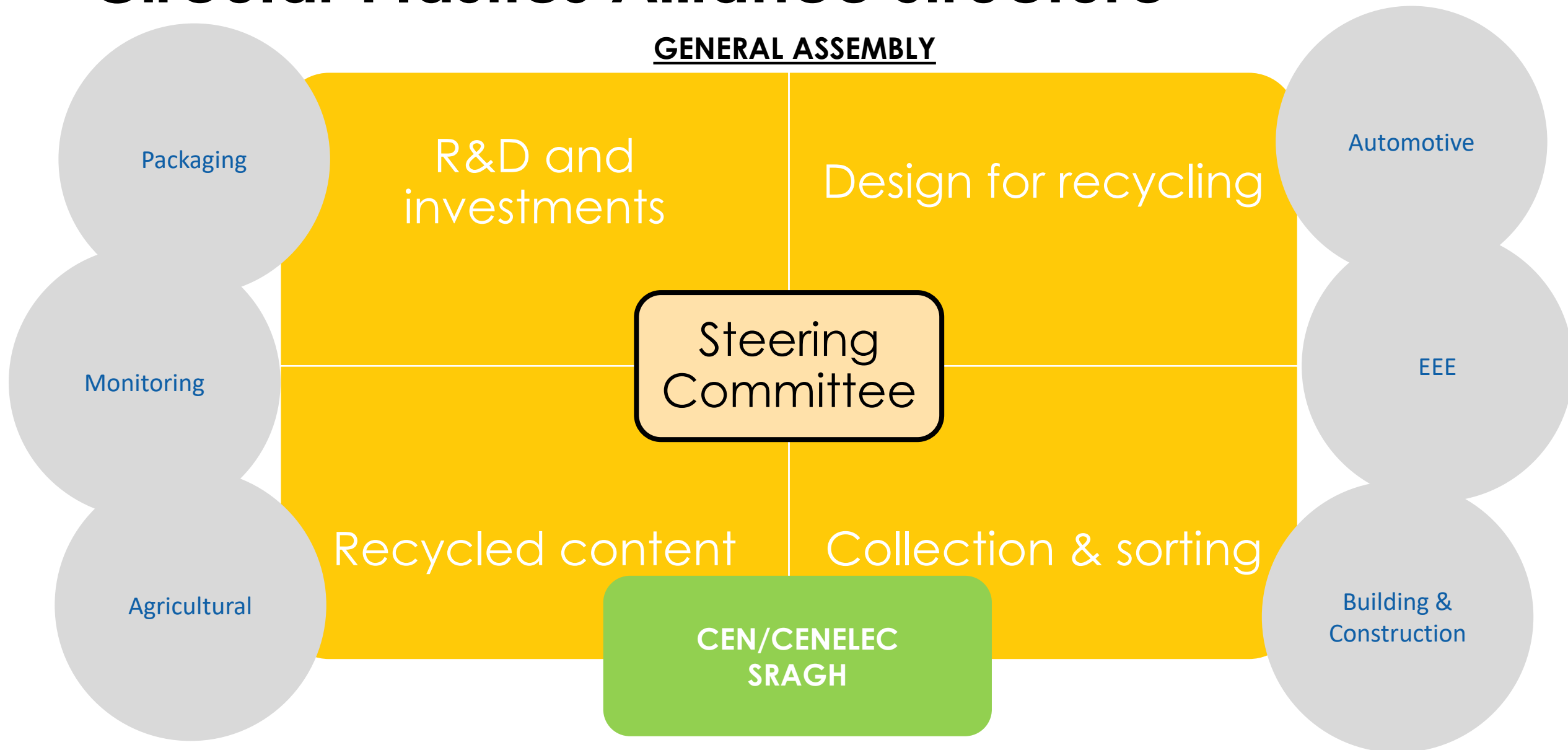


Scope

Making plastics more circular will reduce plastic pollution. This is a priority for the EU. Recycling more plastics is paramount. The Circular Plastics Alliance gathers public and private stakeholders in the plastics value chains to promote voluntary actions and commitments for more recycled plastics. **The Circular Plastics Alliance wants to ensure that 10 million tonnes of recycled plastics are used to make products in Europe in 2025.**



Circular Plastics Alliance structure



Standardisation in the commitment

Design for recycling

- **Develop, update or revise design guidelines**
- Contribute to update CEN and industry **standards** on recyclability

Collection & sorting

- Develop **standards** to assess the quality of sorted plastic waste

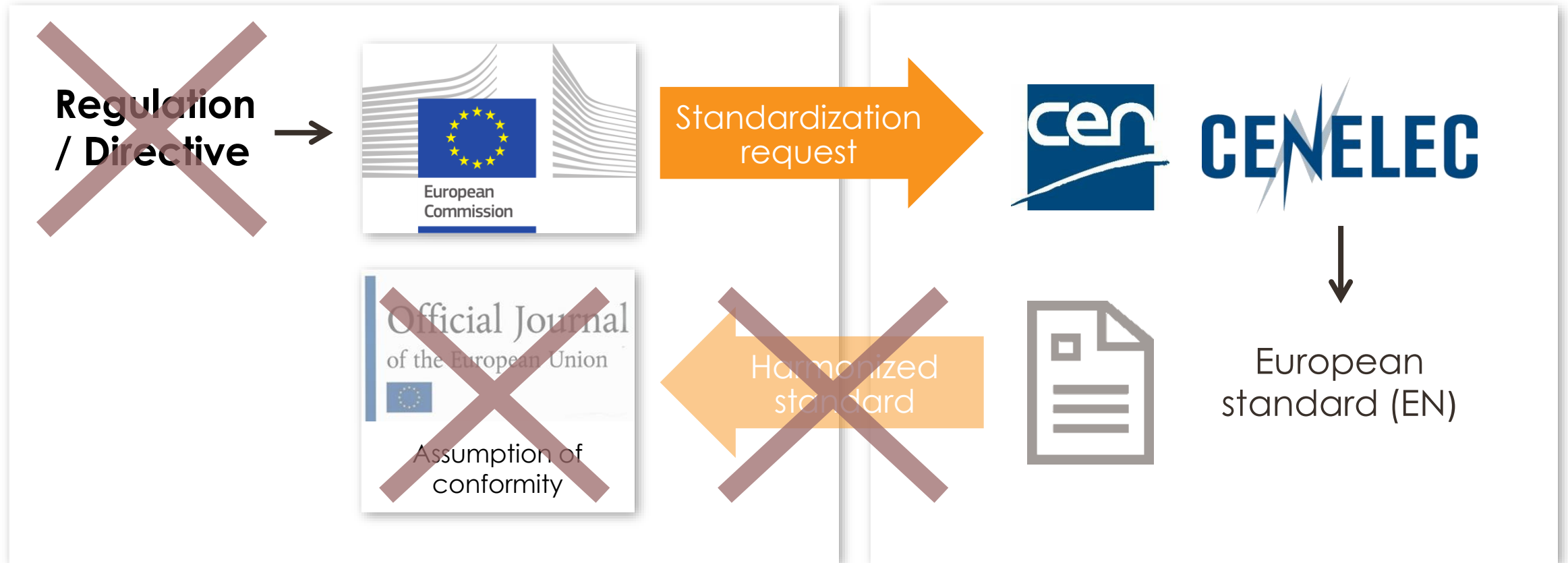
Recycled content

- Support the development or revision of **standards and guidelines** on the quality of plastics recycling and recycled plastics

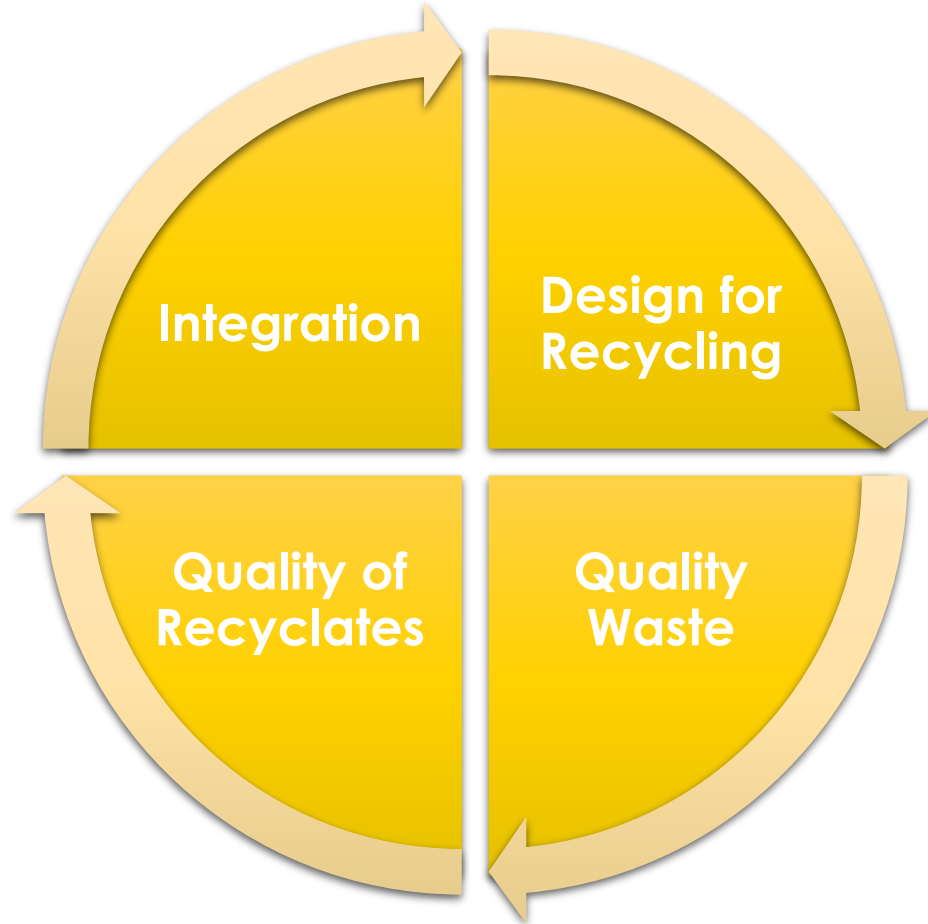
Standardization request linked to legislation



Standardization request not linked to legislation



Scope of Standardisation Request



- Excluded:

- Recycled content calculation
- Mass balance

Structure CPA preparations for SR

D4R

Packaging

PP flex

LDPE flex

HDPE rigid

PS cups & trays

PP rigid

PET bottles

EPS

Agriculture

Mulch films

Small tunnel films

Greenhouse films

Irrigation pipes

Silage films

Balewrap nets

Twines

Non-woven

Barrier films

Covering films

Building &
Construction

Insulation

Cables and cable
conducts

Films, sheets & membranes

Flooring

Pipes & fittings

PVC window profiles &
doors

PP washing machine tubs

ABS housing parts

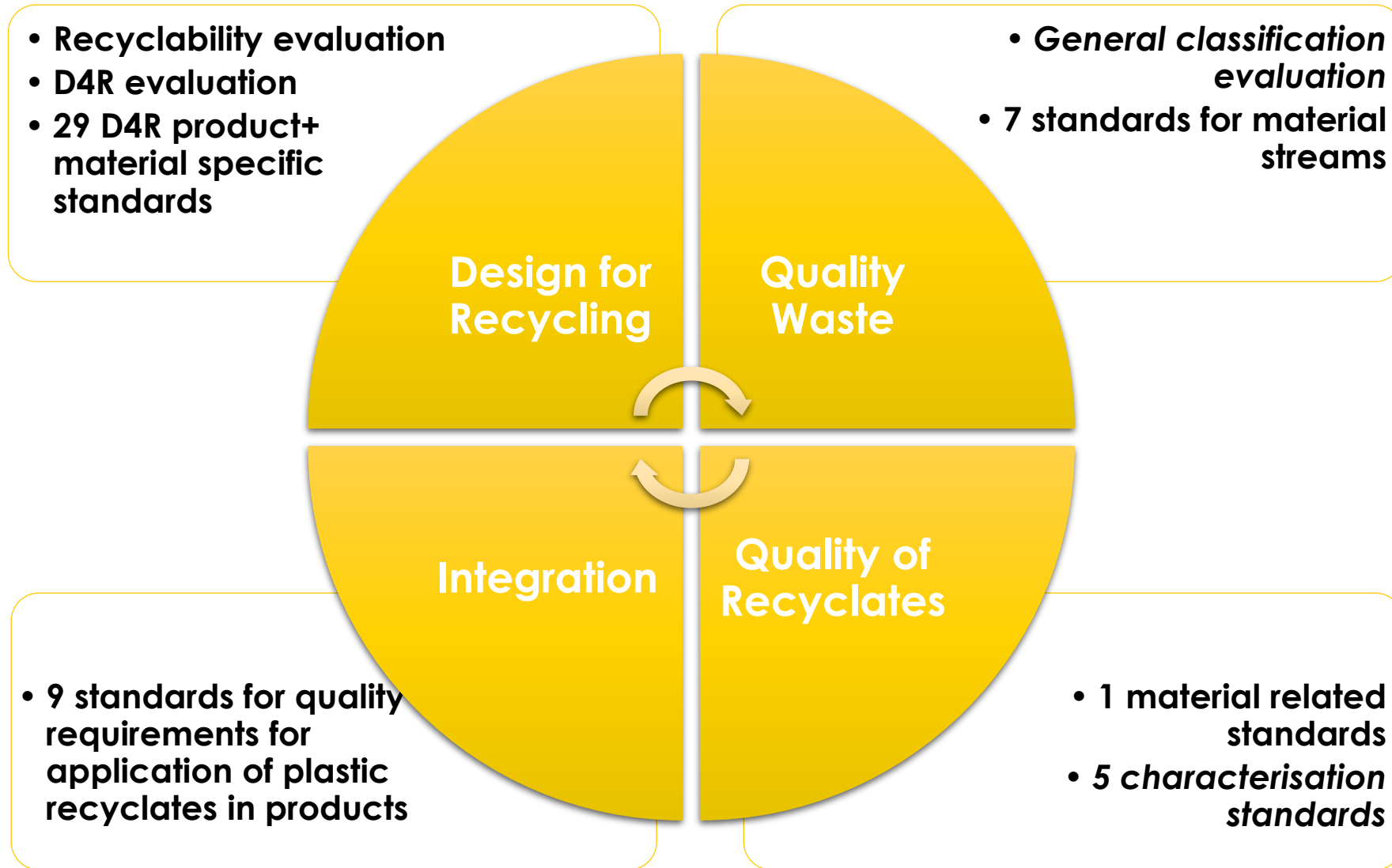
PS refrigerator liners

EEE

Automotive

Shredding

Content Standardisation Request



Content Standardisation Request

- Recyclability evaluation
- D4R evaluation
- 29 D4R product material specifications

- General classification evaluation
- 7 standards for material streams

Totally 58 standards:

47 new

11 revised

- 9 standards for quality requirements for application of plastic recyclates in products

- 5 characterisation standards

Ongoing in Europa, examples

TC 249 Plastics

WG 11 Recycling

Revisions

- EN 1534x-serien:
 - rPVC
 - rPET
 - rPP
- Characterisation of sorted plastics waste
- Plastics recycling traceability and assessment of conformity and recycled content

New

- Plastics — Quality requirements for application of plastic recyclates in products
- DIN SPEC 91446 Classification of recycled plastics by Data Quality Levels for use and (digital) trading

WG 24 Environmental aspects

- Plastics - Environmental Aspects - Vocabulary

TC 261 Packaging/ SC 4 Packaging and environment/WG 3 Material recovery

Revisions

- Report on requirements for substances and materials to prevent a sustained impediment to recycling

New

- Quality grades for plastic packaging for recycling and measuring recycling

Ongoing international, examples

TC 61 Plastics/ SC 14 Environmental aspects

WG 1 Terminology and classification

Revisions

- ISO 15270 Guidelines for the recovery and recycling of plastics waste

New

- Analysis of relevant terms used in the sector and need for standardization

WG 5 Mechanical and chemical recycling

New

- Testing and characterization of mechanically recycled Polypropylene (PP) and Polyethylene (PE) for intended use in different plastics processing techniques
- Gasification
- Chemical recycling

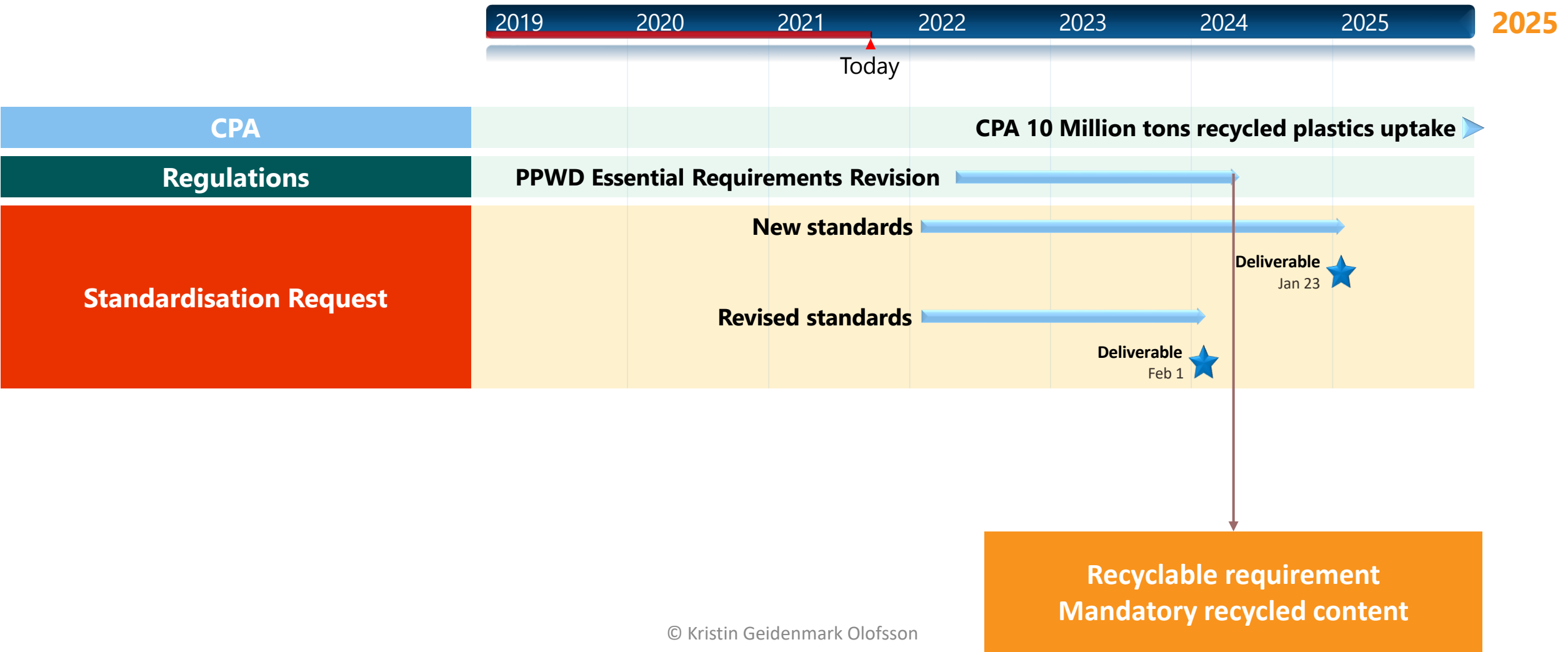
TC 308 Chain of custody

- Mass balance
- Book & Claim

TC 323 Circular economy

- Product Circularity Data Sheet

Time line overview



Thank you

Contact:

Kristin.Olofsson@trioworld.com

RecyClass



HOW RECYCLASS CAN SUPPORT ON THE CPA

FABRIZIO DI GREGORIO
PLASTICS RECYCLERS EUROPE - TECHNICAL DIRECTOR
fabrizio.digregorio@plasticsrecyclers.eu

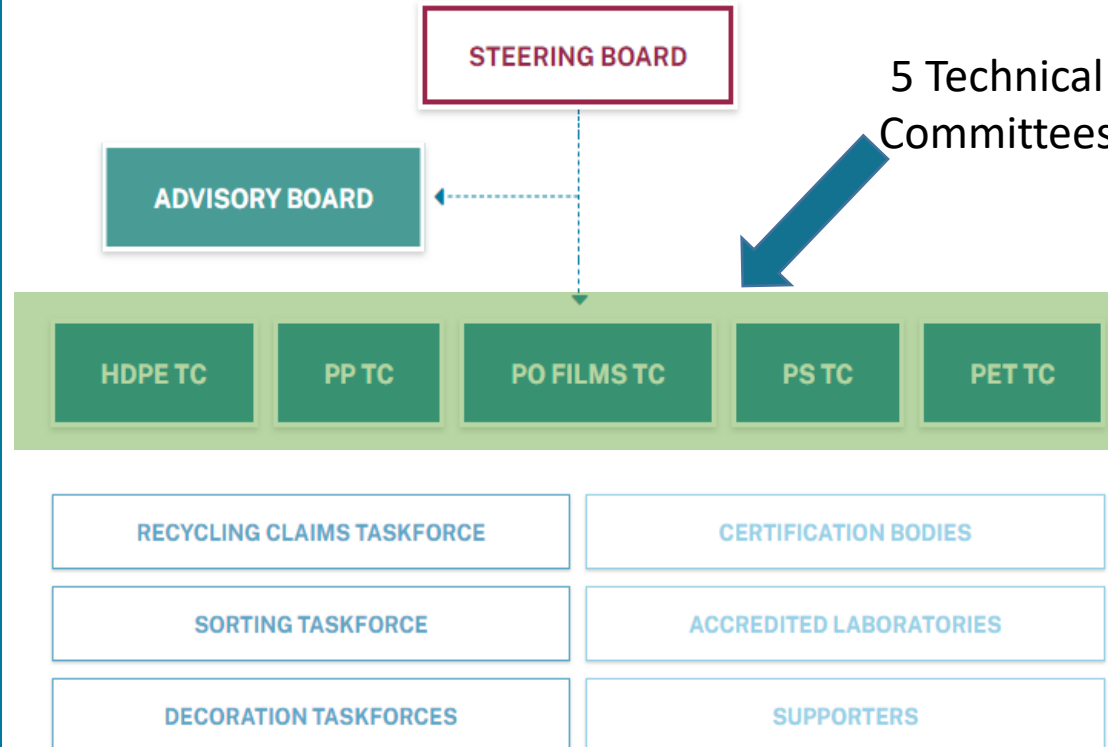
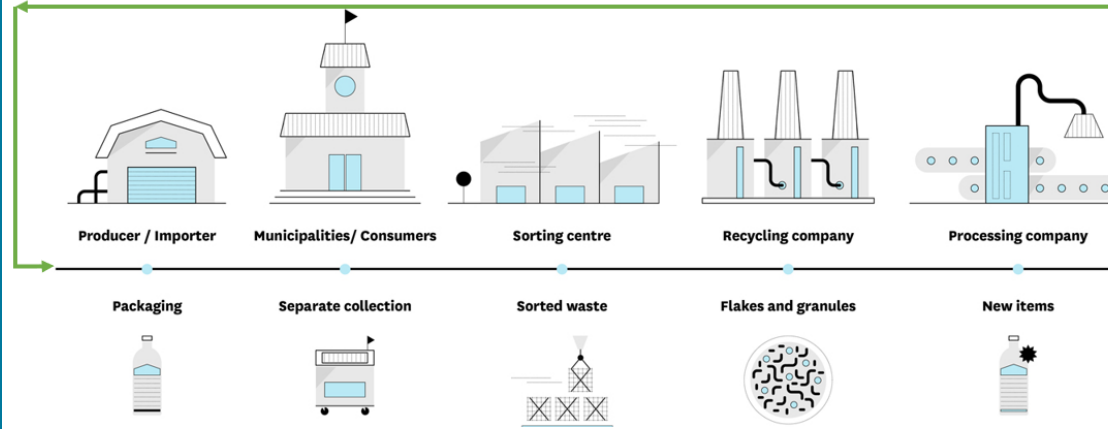


RecyClass

“ Assesses, improves and endorses the **recyclability** & **recycled content** in plastic packaging and plastic products ”

RecyClass

Recycling is possible only if the supply chain exists



- RecyClass is a value chain initiative supported by the European plastics recyclers

- Focus: Design for Recycling
- European harmonization
- Scientific approach
- Fact-based DfR guidelines
- Standard testing protocols
- Available for all

RecyClass



RECYCLABILITY



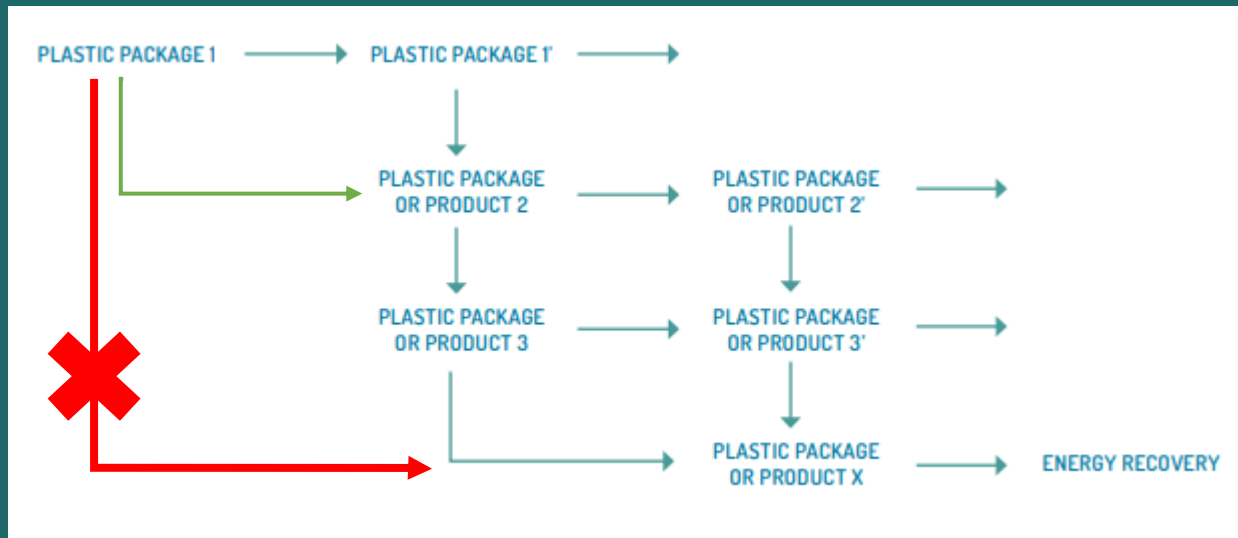
RECYCLED
CONTENT

RecyClass

RECYCLABILITY

WHAT DOES CIRCULARITY MEANS ?

‘A circular economy is one that is restorative and regenerative by design and **aims to keep products, components and materials at their highest utility and value at all times**’ (MacArthur, 2015)



In some cases, functionality requirements make it difficult to design packaging for closed-loop recycling systems.

Designs enabling **expanded multi-step cascaded recycling** remain favourable, for such situations;

YES - FULL COMPATIBILITY

A-B

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



PET bottles (clear/light blue and colored)



PE films (colored and natural)



Clear PET trays



PP films (colored and natural)

CONDITIONAL - LIMITED COMPATIBILITY

B-C

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



HDPE containers & tubes (colored and transparent)



PS colored containers

NO - LOW COMPATIBILITY

D-E-F

Materials that failed the testing protocols
OR
materials that have not been tested (yet), but pose a high risk of interfering with PE recycling



PP containers & tubes (colored and transparent)



Crates and Pallets



EPS fish boxes



EPS white goods

RecyClass | STANDARD TESTING PROTOCOLS

Packaging solutions and/or innovations covered by the Protocols include among others: *resins, barrier materials, mineral fillers/additives, closure systems, liners, seals and valves, labels and sleeves, adhesives, inks.*

Recyclability Evaluation Protocols

- Recyclability Protocol for PE films
- Recyclability Protocol for HDPE containers
- Recyclability Protocol for PP containers
- Recyclability Protocol for PP films
- Recyclability Protocol for PET bottles (EPBP)
- Recyclability Protocol for PET trays (Petcore Europe/EPTP)
- Recyclability Protocol for PS containers *(to be released in December)*

Sorting Evaluation Protocol

- Sorting Protocol for plastic packaging

Quick Test Procedures

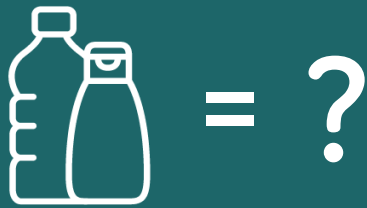
- Washing QT Procedure for film labels and adhesives
- Washing QT Procedure for paper labels and adhesives
- Bleeding Inks QT Procedures *(to be released in December)*



[See all the protocols online](#)

RecyClass | HOW DOES RECYCLASS WORK ?

RECYCLABILITY EVALUATION PROTOCOLS



- **Lab testing** of innovative plastic packaging vs control material
- Comparison of properties
- **Technology/Product Approval**

DESIGN FOR RECYCLING GUIDELINES

RecyClass Natural HDPE Containers and Tubes

	YES: FULL COMPATIBILITY A - B	CONDITIONAL: LIMITED COMPATIBILITY C - D	NO: LOW COMPATIBILITY E - F
DESCRIPTION	Materials that passed the testing protocol with no negative impact on the material's properties and no need for additional processing.	Materials that passed the testing protocol if certain conditions are met, such as the use of specific additives or processing parameters.	Materials that failed the testing protocol and are not recommended for recycling.
RECYCLING COMPATIBILITY	Full compatibility with the recycling stream.	Conditional compatibility, requiring specific conditions to be met.	Low compatibility, not recommended for recycling.
RECYCLING RATE	High recycling rate, up to 100%.	Conditional recycling rate, depending on the material and processing.	Low recycling rate, below 10%.
RECYCLING COST	Low recycling cost, as the material is fully compatible.	Conditional recycling cost, depending on the material and processing.	High recycling cost, as the material is not compatible.
RECYCLING IMPACT	Low impact on the recycling stream, as the material is fully compatible.	Conditional impact, depending on the material and processing.	High impact on the recycling stream, as the material is not compatible.
RECYCLING ADDITIVES	No additives required for recycling.	Specific additives may be required for recycling.	Additives are not recommended for recycling.
RECYCLING PROCESS	Standard recycling process.	Specialized recycling process may be required.	Recycling process is not recommended.
RECYCLING FACILITY	Compatible with standard recycling facilities.	May require specialized recycling facilities.	Not compatible with standard recycling facilities.
RECYCLING CERTIFICATION	Eligible for RecyClass certification.	Eligible for RecyClass certification if conditions are met.	Not eligible for RecyClass certification.

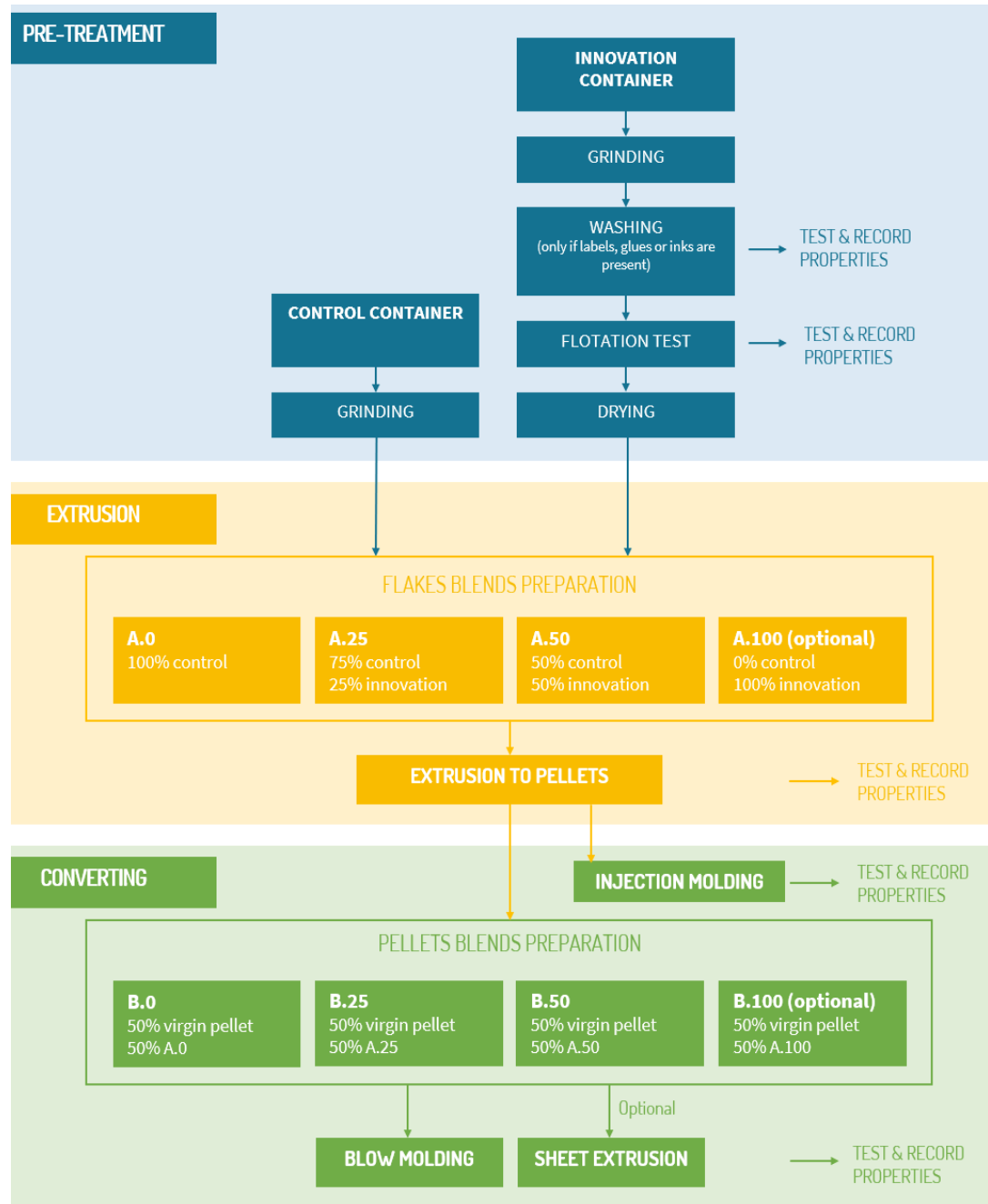
- Design guide & recommendations for plastic packaging
- Design for Recycling (DfR) Guidelines transposed in the tool
- Assessing **overall recyclability** of a finished package

RECYCLASS TOOL

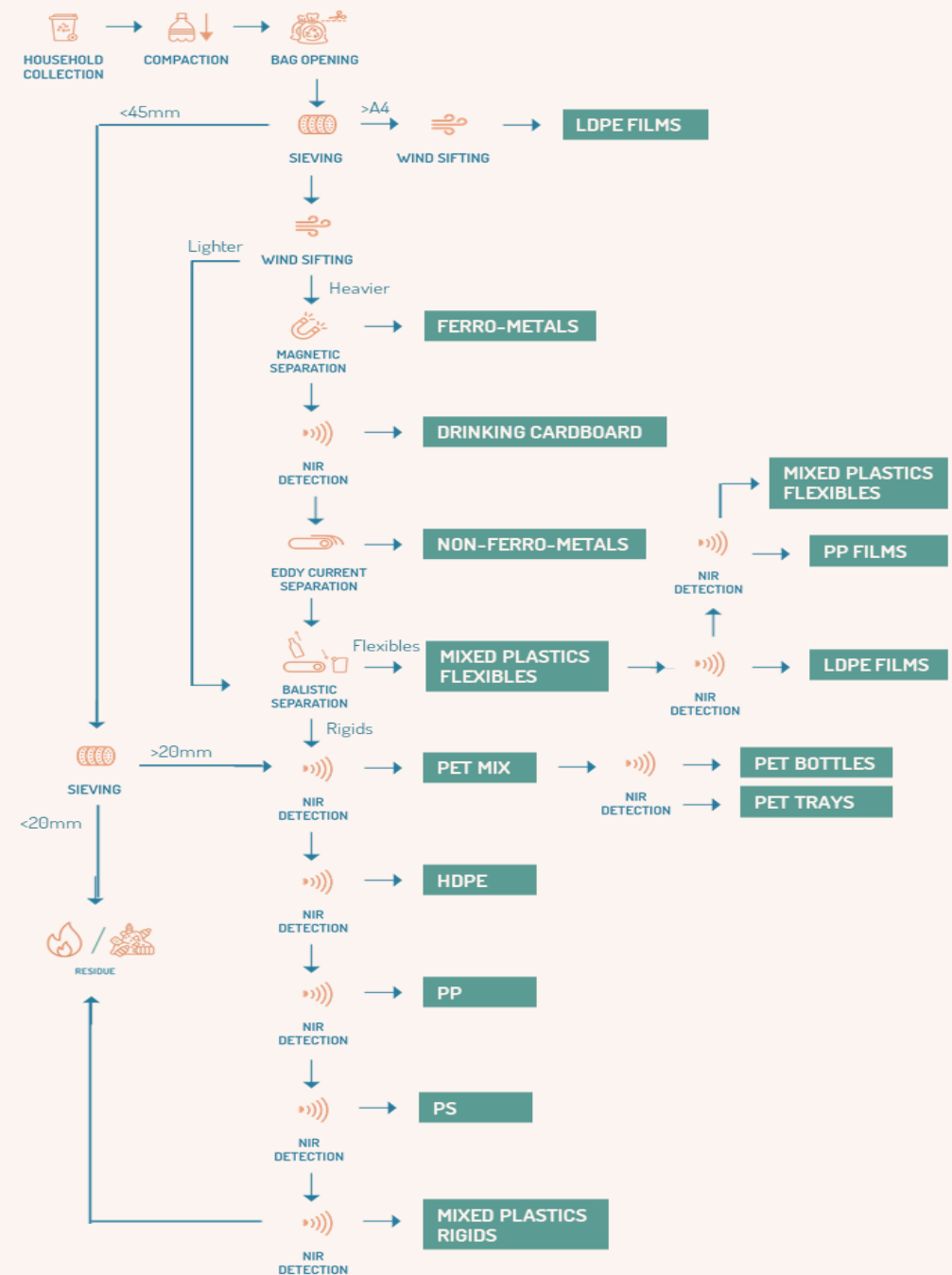


- Recyclability Self-Assessment
- RecyClass Team support
- **Recyclability Certification**

Recyclability Evaluation Protocols (6 labs accredited)



Sorting Evaluation Protocol (2 lines accredited)



RecyClass | FACT-BASED DFR GUIDELINES

RecyClass

PE TRANSPARENT FLEXIBLE FILMS for Household and Commercial Packaging

DfR guidelines are available for transparent and for coloured packaging

Related with RecyClass evaluation testing protocols

DfR guidelines are regularly updated by the RecyClass Technical Committee on the base of new findings

	YES - FULL COMPATIBILITY	CONDITIONAL - LIMITED COMPATIBILITY	NO - LOW COMPATIBILITY
CLASS RANKING*	A-B	B-C	D-E-F
DESCRIPTION (Test Protocol)	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
MAIN MATERIAL	PE-LD, PE-LLD, PE-HD	Multilayer PE/PP with PP ≤ 5%	Multilayer PE/PP with PP > 5%; Any other polymer (e.g. PET, PVC, etc.)
MATERIAL COMPOSITION	A when PE content is > 95%; B when PE content is > 90%	C when PE content is > 70%	D when PE content is > 50%; E when PE content is > 30%; F when PE content is < 30%
COLOURS	Unpigmented; transparent	Light colours; translucent colours	Dark colours; black; carbon black
SIZE	> A4 or > 50 x 50 mm once compacted	< A4 format or between 20 x 20 and 50 x 50 mm once compacted (Sorting test)	< 20 x 20 mm
PRODUCT RESIDUES (Easy to Empty index)	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if the index is < 20%; E if the index is < 25%; F if the index is > 25%
BARRIER	Barrier in the polymer matrix; SiOx and AlOx without additional coatings	< 5% EVOH (in polyolefinic combination film); metallized layers without coatings; <u>EcoLam High Plus; VO+ LLDPE;</u> <u><15% PA 6/66 copolymer with melting temperature < 192 °C and incorporating minimum 10% PE-g-MAH tie layers</u>	> 5% EVOH (in polyolefinic combination film); Any other PA; barrier layer PVC, PVDC; any other barrier layer; foaming agents used as expanding chemical agents; aluminium
ADDITIVES	Additives that do not increase the density higher than 0,97 g/cm ³		Bio-/oxo-/photodegradable additives Additives that do increase the density higher than 0,97 g/cm ³ (CaCO ₃ , talc, glass fibers, etc.)
CLOSURE SYSTEM	PE-LD, PE-LLD, PE-HD	PP	Metal, aluminium, PVC, PET, PETG, PS, PLA, non PO or foams with density < 1 g/cm ³
LINERS, SEALS AND VALVES	PE-LD, PE-LLD, PE-HD	PP, removable aluminium liddings	Metal, aluminium, PVC, PET, PETG, PS, PLA, 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 fiberloss
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	Metal, aluminium, PVC, PET, PETG, PS, PLA, paper, foams with density < 1 g/cm ³
RECYCLED CONTENT	No change in the recyclability assessment. A separate 'Recycled Content Traceability Certification' based on a Chain of Custody approach is available with RecyClass		

Last update - June 2021

* Class ranking resulting from 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

RecyClass | HOW TO CLAIM RECYCLABILITY ?

DESIGN FOR RECYCLING GUIDELINES

The image shows a portion of a detailed table titled 'RecyClass Natural HDPE Containers and Tubes'. The table is organized into three main columns: 'HIGH RECYCLABILITY (A-B)', 'INTERMEDIATE RECYCLABILITY (C-D)', and 'LOW RECYCLABILITY (E-F)'. Each column contains specific design requirements and recommendations for different types of plastic packaging, such as bottles, tubs, and containers. The requirements cover aspects like material purity, additives, and structural design to ensure optimal recyclability.

- Design guide & recommendations for plastic packaging
- Design for Recycling (DfR) Guidelines transposed in the tool
- Assessing **overall recyclability** of a finished package

RECYCLASS TOOL



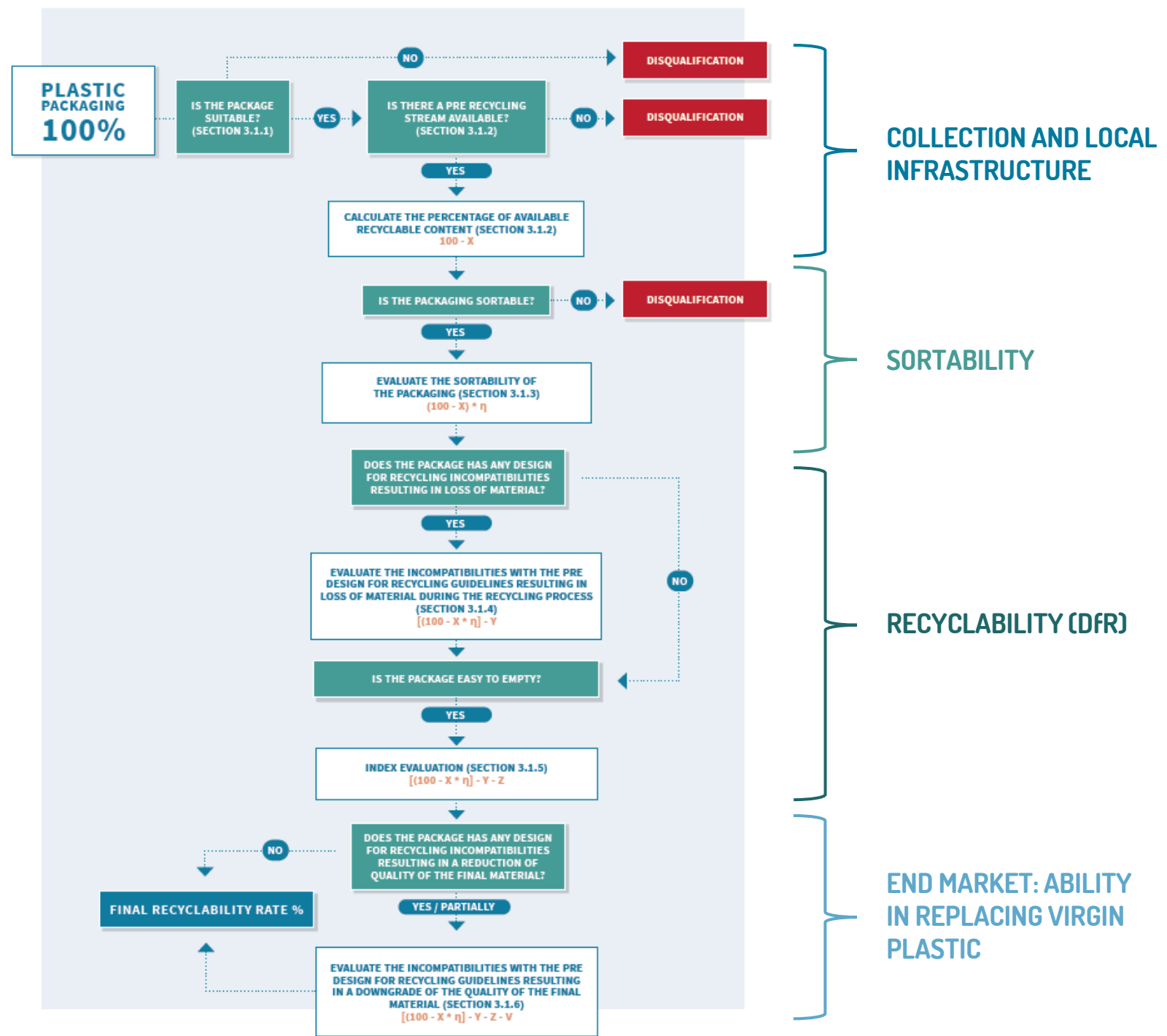
- Recyclability Self-Assessment
- RecyClass Team support

RECYCLABILITY CERTIFICATION

The image shows a template for a 'RecyClass RECYCLABILITY RATE CERTIFICATE'. It includes fields for 'PRODUCT NAME' and 'BRAND NAME', and a section for 'LEGAL COMPANY NAME AND ADDRESS'. A large '90%' is displayed next to the 'RECYCLABILITY' label, with a note explaining that this value represents the proportion of material in the packaging that is recoverable and valuable for recycling. The certificate also features the RecyClass ABCDEF logo and a section for 'CERTIFIED BY' with fields for the auditor's name, date of issue, and date of expiration. The footer contains contact information for RecyClass and a page number 'PAGE 1/1'.

- Recyclability **Assessment** by recognized Certification Bodies

RecyClass

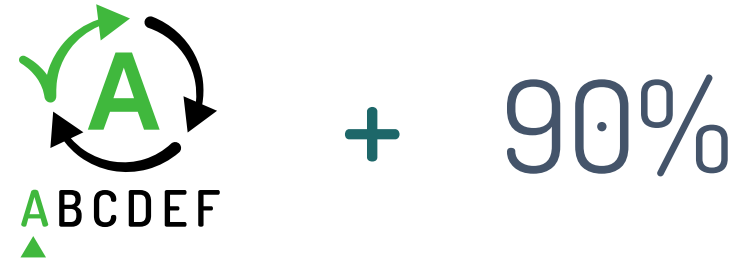


DESIGN FOR RECYCLING ASSESSMENT



- Qualitative Assessment: **ranking from A to F**
- Valid for the **EU market**
- Based on the **European plastic waste streams**
- Packaging design, sorting behaviour, end-markets included

RECYCLABILITY RATE ASSESSMENT



- Quantitative Assessment: **% of recyclable content, in addition to class ranking**
- **Country-specific**
- Based on the **local collection and availability of infrastructures**
- Packaging design, sorting behaviour, end-markets included



RecyClass | HARMONIZATION and CERTIFICATION BODIES

- HARMONIZED DESIGN FOR RECYCLING GUIDELINES
- HARMONIZED RECYCLABILITY METHODOLOGY



SPAIN



AUSTRIA



GREECE, SERBIA



FRANCE



ITALY, SPAIN, PORTUGAL



NORWAY



UK



PLASTSHIP
Your plastic recycling network

GERMANY



SWITZERLAND



EU 27+3



SWEDEN, NORWAY, FINLAND, DENMARK



[Detailed list and contacts of certification online](#)

RecyClass | USE OF CLAIMS

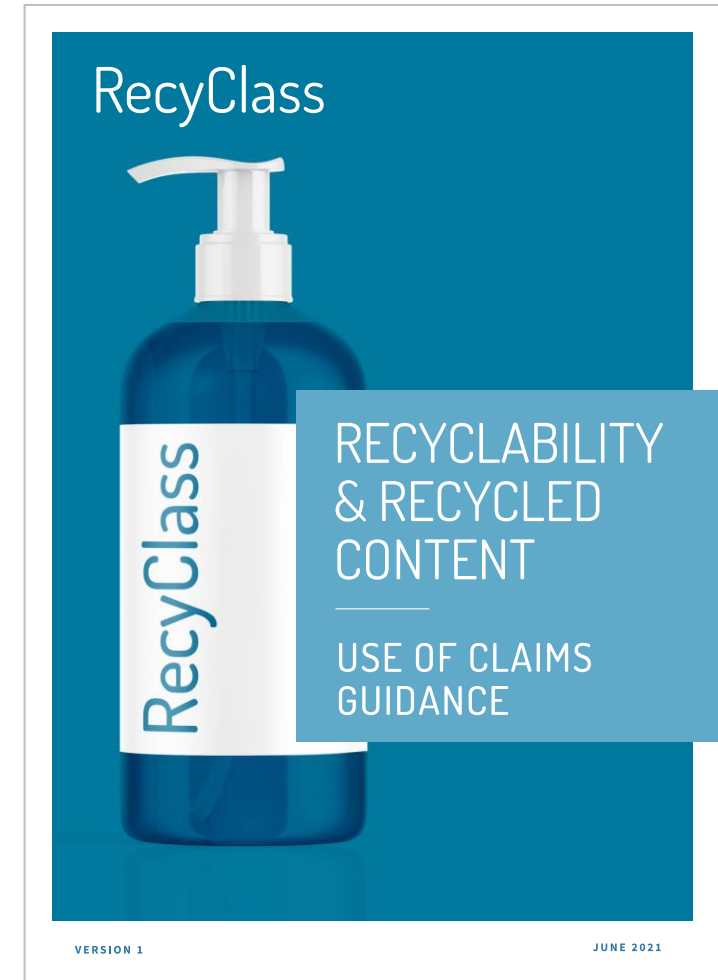
Guidance detailing when and how to use RecyClass claims and logos by certified companies and products.

RECYCLABILITY:

- Technology/Product Approval (mainly for innovative package)
- Letter of Compatibility (semi-finished package)
- Design-for-Recycling Certification
- Recyclability Rate Certification

RECYCLED CONTENT:

- Recycled Plastics Traceability Certification



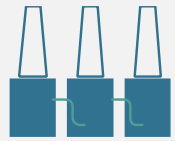
RecyClass

RECYCLED CONTENT

RecyClass | RECYCLED CONTENT (AUDIT SCHEME)

➔ Certification **recognises the use of recycled plastics in products** via an independent third-party audit.

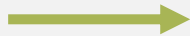
➔ Audit Scheme verifies the traceability of recycled material in different process steps throughout **the whole chain of custody of the recycled material**.



RECYCLER



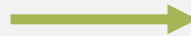
Traceability
Certification
EN 15343



COMPOUNDER



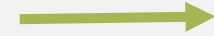
Recycled Content
Traceability
Certification



CONVERTER



Recycled Content
Traceability
Certification

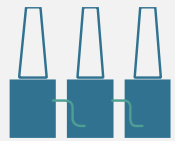


PRODUCER



Recycled Content
Traceability
Certification

RecyClass | ORIGIN OF THE WASTE



RECYCLER

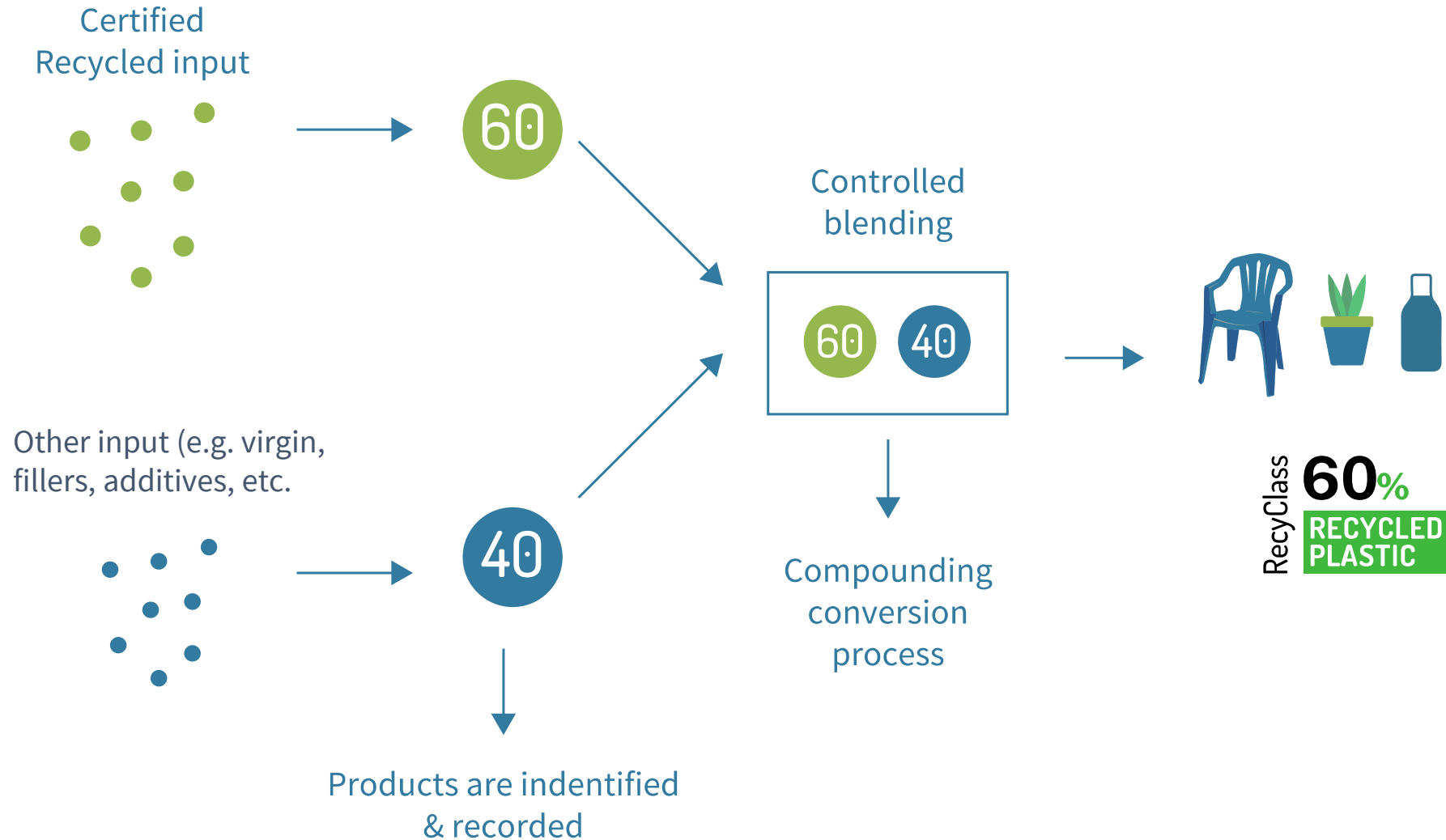


Traceability
Certification
EN 15343

- **RecyClass recognises EuCertPlast Certifications to verify the origin of the waste.**
- Certification for **plastics recyclers** ensuring traceability of plastic waste from input bales to output recyclates; as well as quality process, recycled content and environmental performance.
- Central part of the audit is the traceability check, check of the origin of material and mass balance calculation and recycled content.
- Based on standard **EN 15343:2007** Plastics recycling traceability and assessment of conformity and recycled content.

- Certification follows a **controlled blending approach** as a chain of custody model as described in ISO/IEC 22095:2020, the certification relates to recycled plastics when mixed with other materials or substances resulting in a **known proportion of recycled content of plastics** in output products, focusing on the **physical presence** of the material or products.
- The organisation active in the chain of custody of the product or material must ensure that the **physical input and outputs of recycled plastics assessed during the audit are identified, monitored and documented.**

RecyClass | RECYCLED CONTENT CALCULATION



RecyClass | CERTIFICATE & LOGOS

RecyClass

RECYCLED CONTENT TRACEABILITY CERTIFICATE

ENTER COMPANY

COMPANY ADDRESS

Has been assessed in accordance with the Audit Scheme 1.0 in line with EN 15343:2007 and has the required procedures in place in order to ensure the traceability of recycled plastics incorporated in products listed in the attached Annex.

Type of products:

Type of process or operation:

Audit Report and Certificate Registration Code: 100-100-100

Date of issue of certificate: 05/2002

Date of expiry: 05/2002

*Validity conditions and terms of use may be found in the Audit Scheme documents.

Click on icon to add Certification Logo

CERTIFIED BY:

NAME OF THE AUDITOR: 100-100-100

TITLE OF THE AUDITOR: 100-100-100

CERTIFICATION NAME: 100-100-100

CERTIFICATION ADDRESS: 100-100-100

RecyClass - Avenue de Broqueville 14, 1200 Woluwe-Saint-Pierre - Belgium - Phone: +32 2 512 54 91 - info@recyclclass.eu - www.recyclclass.eu

PAGE 1/X

RecyClass

LIST OF CERTIFIED PRODUCTS

Name of product/family	Reference	Recycled Content (pre-consumers)	Recycled Content (post-consumers)
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%
Name of product/family	Reference	%	%

Audit Report and Certificate Registration Code: 100-100-100

Date of issue of certificate: 05/2002

Date of expiry: 05/2002

*Validity conditions and terms of use may be found in the Audit Scheme documents.

Click on icon to add Certification Logo

CERTIFIED BY:

NAME OF THE AUDITOR: 100-100-100

TITLE OF THE AUDITOR: 100-100-100

CERTIFICATION NAME: 100-100-100

CERTIFICATION ADDRESS: 100-100-100

RecyClass - Avenue de Broqueville 14, 1200 Woluwe-Saint-Pierre - Belgium - Phone: +32 2 512 54 91 - info@recyclclass.eu - www.recyclclass.eu

LOGOS WITH ADDITIONAL INFORMATION

RecyClass Recycled Plastics logo - Example use of 35% of pre-consumer recycled plastics



A graphic consisting of four thick, light blue curved arrows arranged in a circle, pointing clockwise. The arrows are positioned around the central text, with one at the top, one on the right, one at the bottom, and one on the left.

RecyClass

PLASTICS FUTURE IS CIRCULAR

Thank you for
your attention



Questions & Answers

Use the Q&A box in the top-right corner of your screen

RecyClass



Thank you for participating!

Save the dates for 2022!

23 February

20 April

6 July

RecyClass