RecyClass

RecyClass Unwrapped

Design for Recycling Guidelines

Welcome to the first *RecyClass Unwrapped* webinar

Moderated by
Mike Baxter | External Affairs Director|
Berry bpi group

RecyClass

RecyClass Unwrapped

Design for Recycling Guidelines

Mastering recyclability with RecyClass

Paolo Glerean
Chairman of RecyClass

How to boost plastics circularity in Europe?

- **Harmonised** Design for Recycling guidelines **are essential;**
- **STANDARDIZATION** of definitions, testing protocols and methodologies to assess recyclability with a **scientific approach;**
- **High end applications** must be **the benchmark.**

RecyClass™

RecyClass™

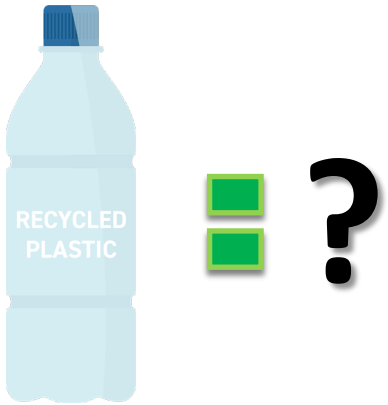
RecyClass Unwrapped Webinar

Design for Recycling guidelines

Fabrizio di Gregorio

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 * 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	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	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
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Additives			Bio-/oxo-/photodegradable additives; additives concentration > 0,97 g/cm³
Closure Systems	PE-LD, PE-LLD, PE-HD	PP, PET, PETG, PS, PLA	metal, aluminium, PVC, non PO or foams with density < 1 g/cm³
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/cm³
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
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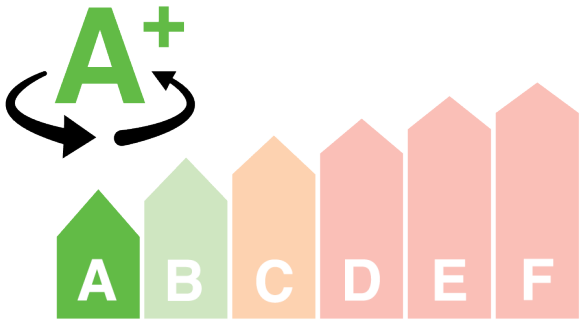
Direct Printing	Laser marked print; Printed production or expiry date	printing covering < 50% **	printing covering > 50% **
Other Attachments	PE-LD, PE-LLD, PE-HD	PP , PET, PETG, PS, PLA	metal, aluminium, PVC, paper, foams with density < 1 g/cm³

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**

RecyClass™

What do guidelines do?

RecyClass™

PE Transparent Flexible Films

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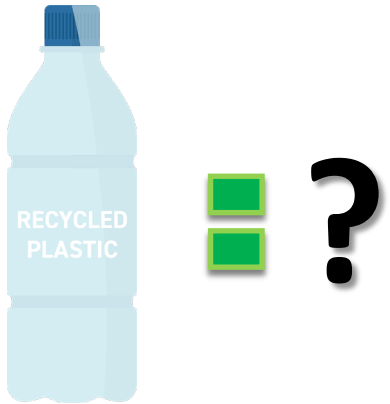
** temporary solution

How to develop a guideline?

Recyclability Evaluation Protocols → Design for Recycling Guidelines



- **Test** on recycled product with and without the substance/component to be tested.
- Comparison of properties vs a control
- **Full compatible, limited compatible, no compatible**

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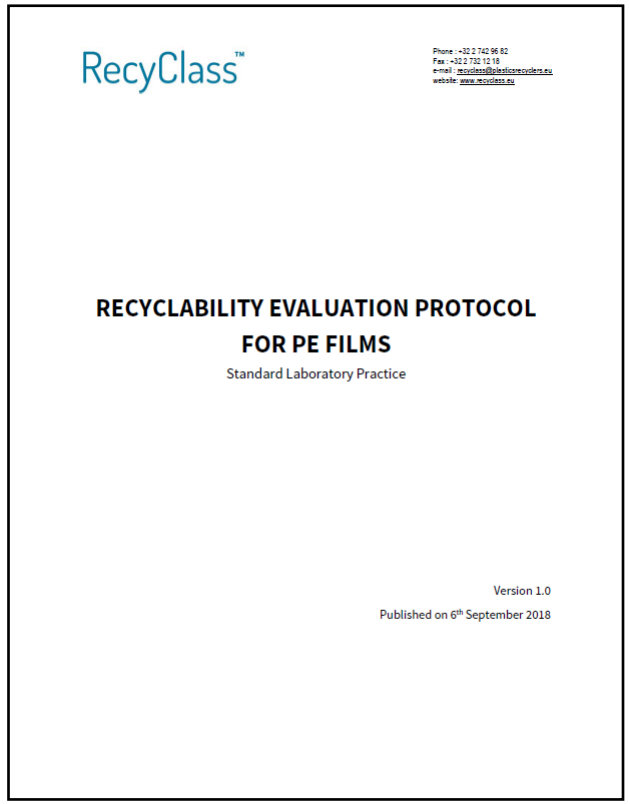
** temporary solution

RecyClass™

Recyclability Protocol for PE films


RecyClass™

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Fax : +32 2 732 12 18
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website: www.recyclass.eu

RECYCLABILITY EVALUATION PROTOCOL FOR PE FILMS

Standard Laboratory Practice

Version 1.0

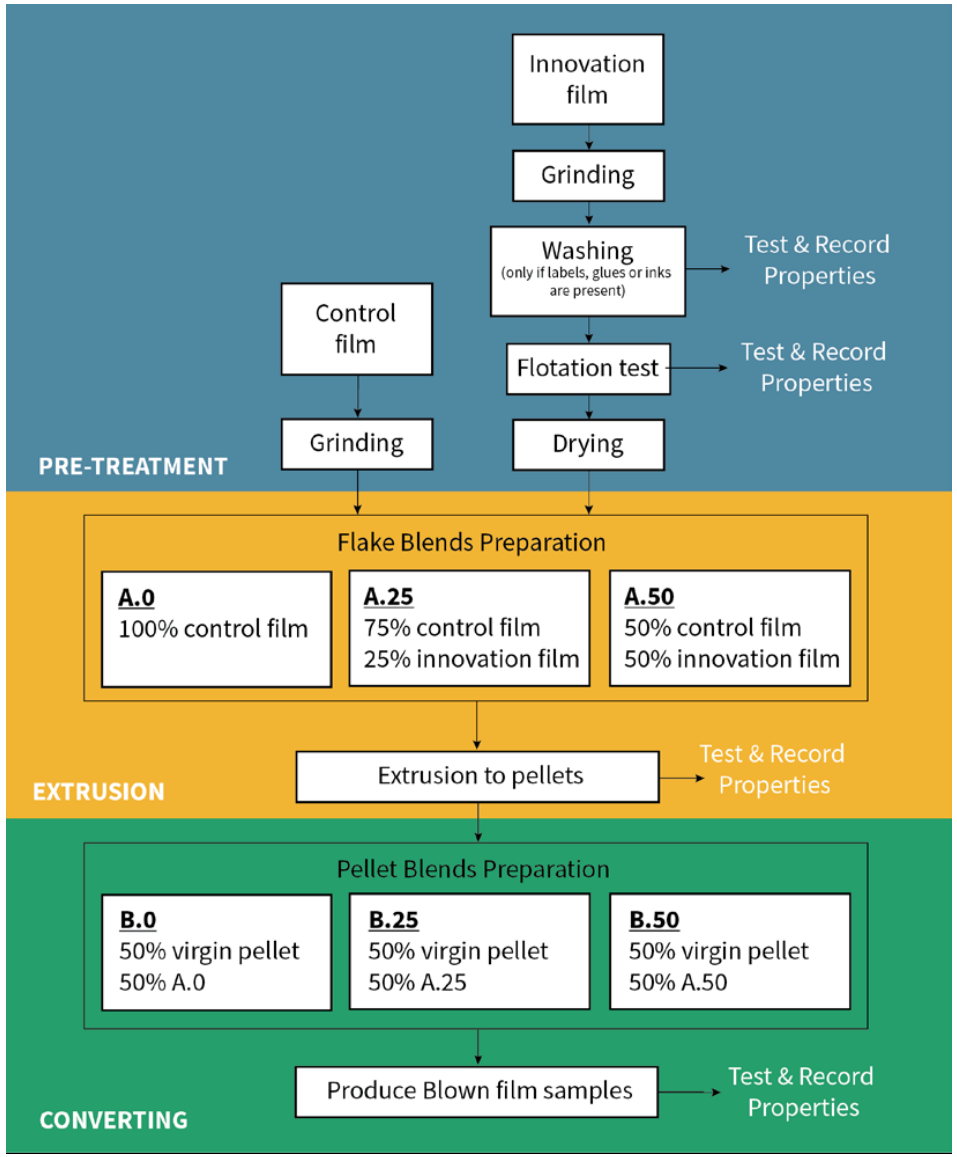
Published on 6th September 2018

The following packaging solutions and/or innovations are covered by the scope of the Protocol:

- Non-PE layers and coatings, including PA, EVOH, and others not specified.
- Rigid PE and Non-PE attachments to the PE film tested packaging.
- Mineral fillers and other additives that alter the density of the PE film.
- Adhesives and labels
- Inks and pigments, including direct, reverse, laminated, and other printing technologies
- Compatibilizers and other additives otherwise not specified

RecyClass™

RecyClass™ Recyclability Protocol for PE films



- **Pre-treatments**

Input: 10 kg innovation and 25 kg control samples

- **Extrusion and pellet characterization**

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

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

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

Protocols are publicly available at:
https://recyclass.eu/recyclability-evaluation-protocols/

How to use a guideline?

Design for Recycling Guidelines → RecyClass Tool → Recyclability Certification

PE Transparent Flexible Films

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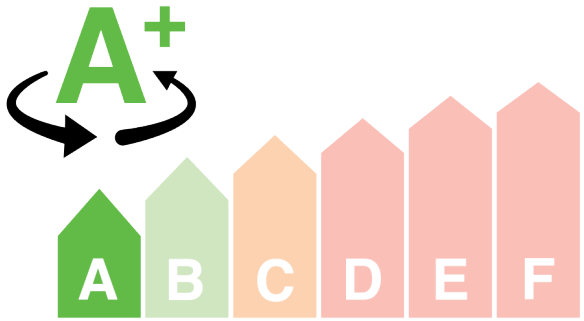
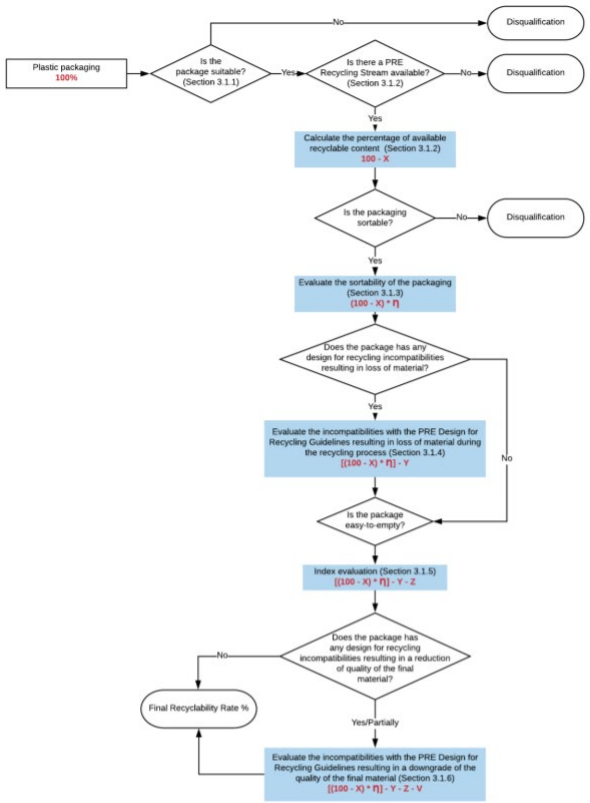


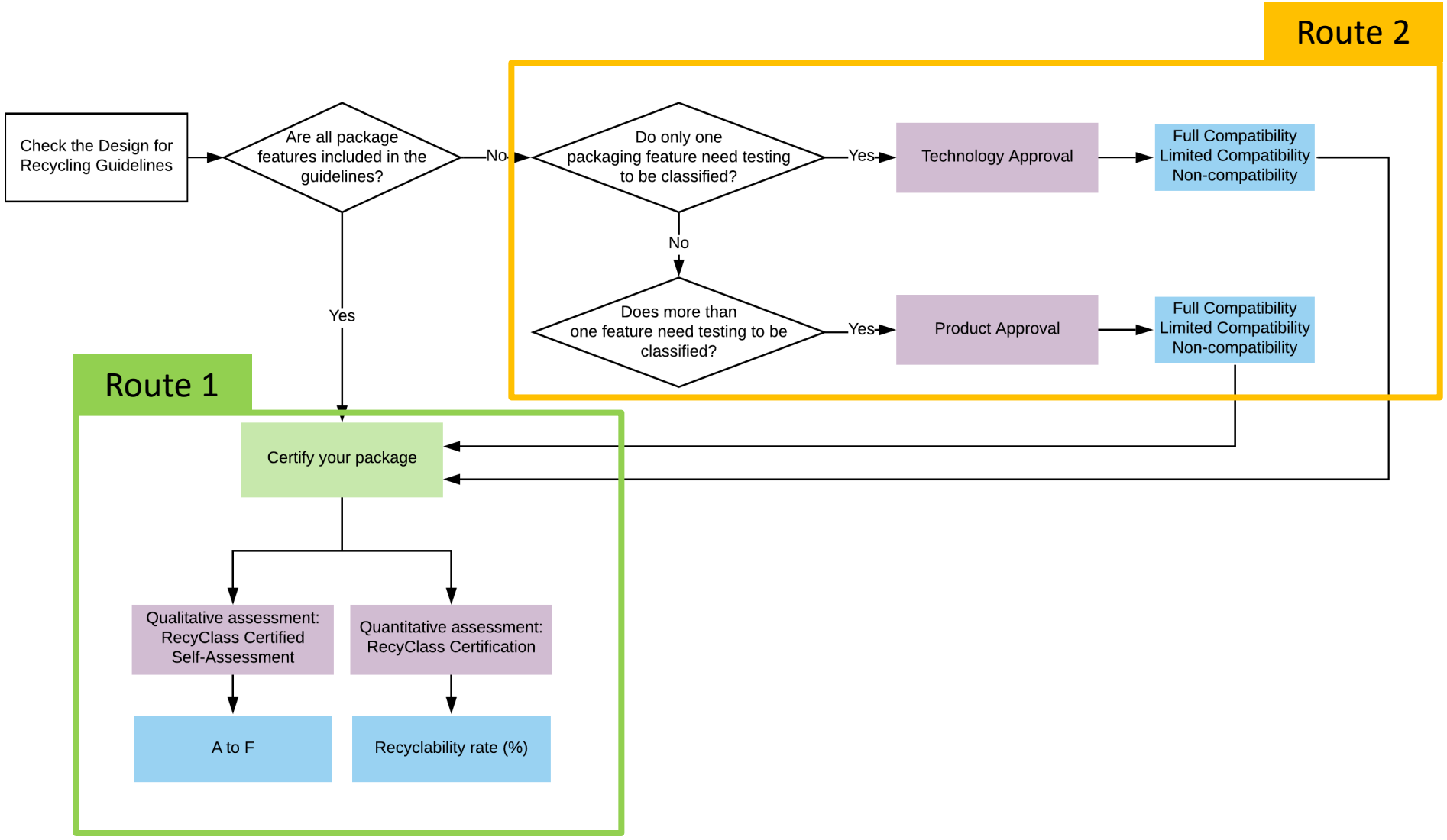


- The DfR Guidelines are transposed to the tool.
- The overall recyclability of the finished package can be assessed.

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

RecyClass™

RecyClass Assessments



RecyClass™

RecyClass set of DfR guidelines

YES - FULL COMPATIBILITY	CONDITIONAL - LIMITED COMPATIBILITY	NO - LOW COMPATIBILITY
A-B *	B-C *	D-E-F *
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- PET bottles (clear/light blue and colored)
- Clear PET trays
- HDPE containers (colored and transparent)
- PP containers (colored and transparent)
- PO pots, tubs, blisters and trays
- PE films (colored and natural)
- PP films (colored and natural)
- Crates and Pallets
- PS containers (under development)

RecyClass™

Recyclability Ranking

- The Design for Recycling Guidelines are transposed to the RecyClass tool
- The overall recyclability of the package could be assessed.

PE Transparent Flexible Films

RecyClass™

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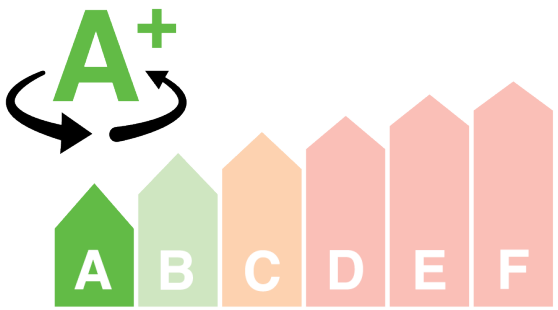
-1 class

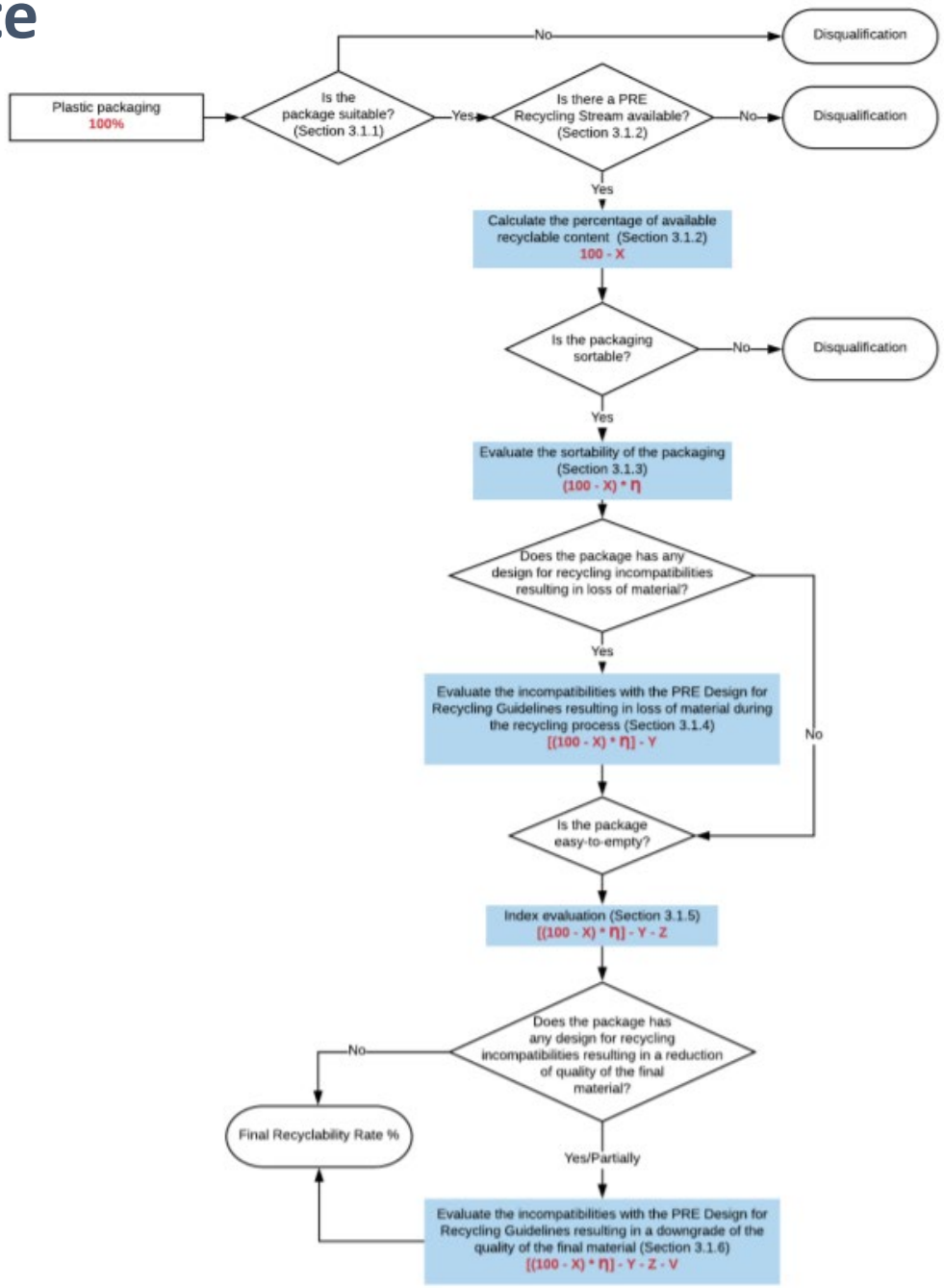
-3 classes



RecyClass™

Recyclability Rate Assessment

Route 1



Collection and local infrastructure

Sortability

Recyclability (DfR)

End market: ability in replacing virgin plastic

Route 1

Accredited Certification Bodies

Aimplas

Spain

Circular Analytics

Austria

Plastship

Germany

Veolia PET Germany GmbH

Sweden, Norway, Finland, Denmark

Recoup

UK

Redilo

Switzerland

Suez Cirpark

EU 27+3

COLLECTION - SORTING - REPROCESING - LEGISLATION - EXTENDED PRODUCER RESPONSIBILITY - DEPOSIT SYSTEMS - FUTURE TECHNOLOGIES

ALIGNMENT of GUIDELINES for RECYCLING

Essential for multinational brand owners

suez
circpack®
EXPERTISE & CERTIFICATION

COLLECTION - SORTING - REPROCESING - LEGISLATION - EXTENDED PRODUCER RESPONSIBILITY - DEPOSIT SYSTEMS - FUTURE TECHNOLOGIES

1

The European ECO-SYSTEM for plastic recycling

suez circpack® EXPERTISE & CERTIFICATION

The European eco-system on plastic recycling

CIRCULAR PLASTICS ALLIANCE

EUROPEAN PLASTICS PACT

RecyClass™

EPBP

World Business Council for Sustainable Development

PLASTICS RECYCLERS EUROPE

NEW PLASTICS ECONOMY

Global Commitment

CEFLEX
A CIRCULAR ECONOMY FOR FLEXIBLE PACKAGING

plasticbank

suez circpack EXPERTISE & CERTIFICATION

petcore Europe

ALLIANCE TO END PLASTIC WASTE

MINISTÈRE DE LA TRANSITION ÉCOLOGIQUE ET SOLIDAIRE
CITEO
COTREP
FEDEREC
ADEME AGENCE DE LA TRANSITION ÉCOLOGIQUE
valorplast
srp
fnade

Valpak
Environment Agency
SEPA Scottish Environment Protection Agency
Cyfoeth Naturiol Cymru Natural Resources Wales
NIEA Northern Ireland Environment Agency
wrap
OPRL
THE UK PLASTICS PACT

Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit
Stiftung Zentrale Stelle VERPACKUNGSREGISTER
AGVU Arbeitsgemeinschaft Verpackung + Umwelt
BellandVision Zukunft braucht Recycling
DerGrünePunkt
interseroh
LANDBELL
cyclos-HTP Institute for Recyclability and Product Responsibility
Forum Rezyklat

Afvalfonds Verpakkingen
Kennisinstituut Duurzaam Verpakken
Ministerie van Infrastructuur en Waterstaat

IVCIE Commission interrégionale de l'Emballage Interregionale Verpakkingscommissie
Fostplus
valipac VOOR EEN DUURZAME TOEKOMST

Many design for recycling GUIDELINES

Organisation:	Country:	What?	Used for:
Citeo	France	recyclability assessment tool (LCA-based, free)	-
Cotrep	France	DfR guidelines (do & don't approach)	-
Danish Plastics Federation	Denmark	DfR guidelines	-
Der Grune Punkt (DSD)	Germany	DfR guidelines	-
EPBP	Europe	DfR guidelines + lab protocols	technology approvals
EXPRA	Europe	DfR guidelines + tool	-
FH Campus Wien	Austria	DfR guidelines + methodology	-
HTP-Cyclos	Germany	recyclability assessment (certification)	certification
IK	Germany	Eco Design of Plastic Packaging	-
IKV	Netherlands	DfR guidelines (do & don't), decision tree (for rigids)	-
OPRL (on pack recycling label)	UK	recyclability assessment (tool and labelling, only for members)	certification
Petcore Europe	Europe	DfR guidelines + recyclability protocol	technology approvals
Recoup	UK	DfR guidelines + tool (Packscore) - aligned with RecyClass	certification
RecyClass	Europe	DfR guidelines, recyclability assessment (free online tool) + certification, lab protocols	technology approvals
Suez.Circpack	Global	DfR guidelines, recyclability assessment - aligned with RecyClass	certification
WRAP	UK	DfR guidelines (yes please/no thanks approach)	-
Zentrale Stelle	Germany	DfR guidelines + methodology	certification
APR	US	DfR guidelines + lab protocols	technology approvals

Round Table Eco:Design of Plastics Packaging

Increase in EcoModulation

Stimulus to change packaging design

- Under a modulated fee approach, the fees paid by the producer will vary according to specific criteria relating to aspects of their packaging's environmental performance.
- More ‘environmentally-friendly’ packaging are charged at a lower rate than those that are less ‘environmentally friendly’ to incentivise eco-design.
- **How is this certified?**

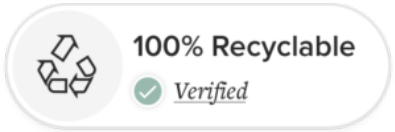
Stiftung Zentrale Stelle VERPACKUNGSREGISTER
MINIMUM STANDARD

RECYCLE CHECK

CITEO
Donnons ensemble une nouvelle vie à nos produits.

Certifications & logo's

Many different approaches:



Complexity

Dealing with complexity is an inefficient and unnecessary waste of time, attention and mental energy.
There is never any justification for things being complex when they could be simple.

Edward de Bono

Need for simplicity

The value chain needs HARMONISATION of:

- Design Guidelines
- Test protocols on sorting
- Test protocols on reprocessing
- Certification & scoring methodology
- Standardised logo
- Clarity on country specific situations

COLLECTION - SORTING - REPROCESING - LEGISLATION - EXTENDED PRODUCER RESPONSIBILITY - DEPOSIT SYSTEMS - FUTURE TECHNOLOGIES

How to make an assessment of recyclability for your packaging?

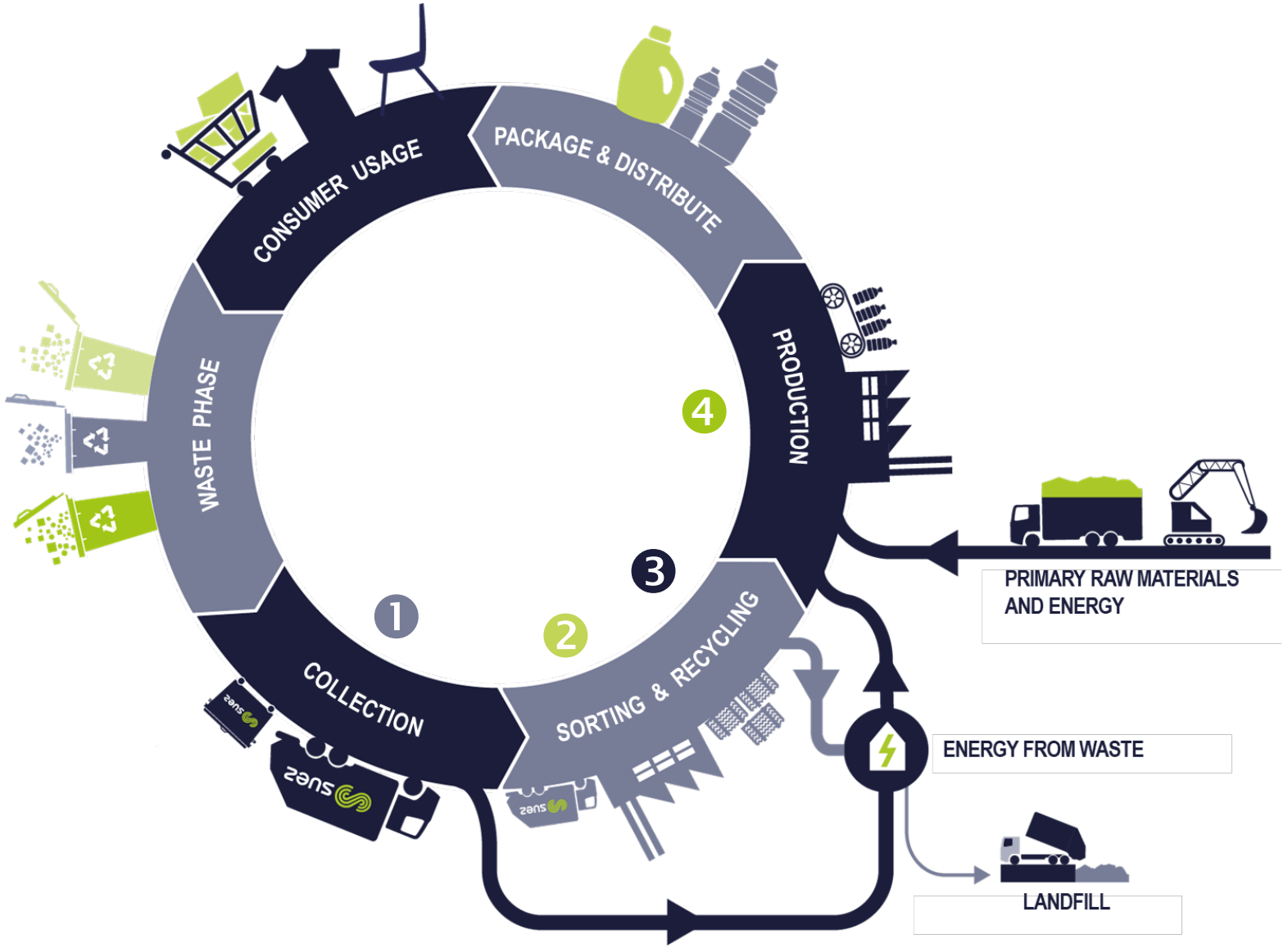
Alignment of Guidelines

suez circpack® EXPERTISE & CERTIFICATION

Assessing Recyclability

How to assess?

1. COLLECTION
2. SORTING
3. REPROCESSING
4. APPLICATION



Assessing Recyclability

What to assess?

1. COLLECTION

IS a collection system in place?

WHAT is allowed in?

HOW is the material collected? Curbside? Deposit?

WHERE is the material collected? Households? B2B?

General waste? or source SEPERATION?

Own TAKE-BACK system?

How MUCH is collected?

2. SORTING

Is ADDITIONAL sorting required?

Which TECHNOLOGIES are used for crude-sorting?

Which MATERIALS are being sorted?

SIZE limitations?

WEIGHT & RESIDUE issues?

How are COMPOSITE materials being recognized & sorted?

EFFICIENCY rate?

3. REPROCESSING

Which MATERIAL are we going to reprocess?

Which TECHNOLOGIES are used for fine-sorting?

HOW is the sorted material treated?

Blocking substances? PV(d)C, Silicone, metal, etc.

EFFICIENCY rate?

What happens to the RESIDU?

4. APPLICATION

What is the QUALITY of the Secondary Raw Material?

In what type of APPLICATION can the material be applied?

Can it replace the same type of virgin material?

Is the material being blended or DOWNGRADED?

Assessing Recyclability

Main challenges for:

2 SORTING

- Carbon black
- Full body sleeves
- Large labels
- Multi-material composites
- Aluminium film
- Product residue & weight

3 REPROCESSING

- Non-soluble glue
- Fibre losing paper labels
- Blocking substances (e.g. silicone & metals)
- Multi-material composites

These challenges are covered in the RecyClass certification by:

- **Design for Recycling Guidelines**
- **Sorting test**

COLLECTION - SORTING - REPROCESING - LEGISLATION - EXTENDED PRODUCER RESPONSIBILITY - DEPOSIT SYSTEMS - FUTURE TECHNOLOGIES

2 Understanding the Value Chain

Alignment of Guidelines

suez circpack® EXPERTISE & CERTIFICATION

Understanding the Value Chain

- Huge **challenges for ALL players** in the Value chain
- In a circular economy there is **no front-end or back end**
- **Sharing knowledge** is essential for **understanding**
- **Mutual understanding** is essential for **change**

COLLECTION - SORTING - REPROCESING - LEGISLATION - EXTENDED PRODUCER RESPONSIBILITY - DEPOSIT SYSTEMS - FUTURE TECHNOLOGIES

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Thank you for your attention!

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Towards an EU Definition of Recycling in a Circular Economy

RecyClass Unwrapped Webinar

22 October 2020

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Outline

1. About Eunomia
2. Previous Work: Essential Requirements Scoping Study
   - Recyclable definition
   - Recycled content measures
3. Ongoing work
   - PPWD review impact assessment
   - Recycled content measurement method
4. Key takeaways

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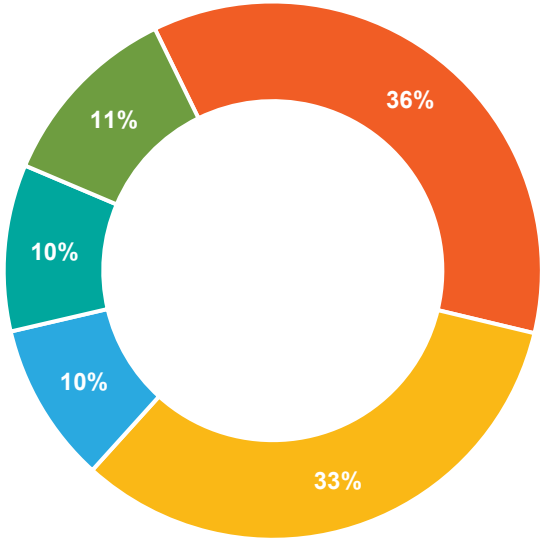
About Eunomia

National, Regional, Government

Ministry of Environment & Energy
Department of Energy & Climate Change
Finnish Government
Department for Environment Food & Rural Affairs
Norwegian Environment Agency
Llywodraeth Cymru Welsh Government
Hong Kong
The Scottish Government
Department of Ecology State of Washington
RPRA Resource Productivity & Recovery Authority

Supranational Government

OECD
JRC European Commission
European Environment Agency
eurostat
UNEP
European Commission
European Medicines Agency Science Medicines Health



Non-Governmental Organisations

wrap
reloop
Greenpeace
C40 Cities
Friends of the Earth
Keep Britain Tidy
CHEMTrust
ClientEarth
Zero Waste Scotland
EEB European Environmental Bureau
WWF
RCA Recycling Council of Alberta
Changing Markets Foundation
sustrans

Local Government

Euro Cities
Camden
Exeter City Council
New York City Department of Sanitation
Surrey County Council
Calgary
SWA Sacramento Regional Solid Waste Authority
Islington
Manchester City Council
Somerset Waste Partnership
Greater London Authority
Town of Needham Incorporated 1711
Scottish Borders Council
City of Westminster

Private Sector

serco
TOMRA
FIFA
Deloitte.
Danone
M&S
SSE
esa environmental services association
Tesco
Europen
Eastman
Macquarie
I Squared Capital
Red Bull
ALDI SÜD
BASF We create chemistry
Nestlé
PepsiCo
Ball
suez
Coca-Cola

Essential Requirements Scoping Study

- **Essential Requirements have not adequately reflected the waste hierarchy**
- **Growth in packaging that is neither reusable nor recyclable**
- **All packaging to be reusable or recyclable by 2030**
  - **Reusable packaging also recyclable**
  - **No further support for packaging to be designed with energy recovery only in mind**
- **Implementation of the definition is key**

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Essential Requirements Scoping Study

- **No reference to recycled content in Essential Requirements**
  - Scope to support recycling targets
- **Use of recyclate limited by:**
  - Legal restrictions (e.g. food contact rules)
  - Availability of supply
  - Price
  - Mechanical properties
  - Visual appearance

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Recyclable Definition - Qualitative

- ***Recyclable packaging is that which can be effectively and efficiently separated from the waste stream, collected, sorted and aggregated into defined streams for recycling processes, and recycled at scale through relevant industrial processes such that it is turned into a secondary raw material, in line with Article 6a of the PPWD for calculating recycling targets, and of a sufficient quality that it can find end markets to replace the use of primary raw material.***
- ***Innovative packaging placed on the market that requires new infrastructure to be developed shall be recycled at scale within a certain period of time. At least 95% of the functional unit of packaging shall be recyclable according to this definition, with the remaining minor components compatible with the relevant recycling process and not hindering the recyclability of the main components, through reference to CR 13688 [or another standard].***

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Recyclable Definition - Quantitative

- **Packaging that is recycled at a rate above a threshold is deemed “recyclable”, or**
- **‘scoring system’ could allow for use of minimum score against a quantified metric**

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Recyclable Definition - DfR

	YES Full compatibility – 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 PET recycling	CONDITIONAL Limited compatibility – 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 PET recycling	NO Low compatibility – materials that failed the testing protocols OR materials that have not been tested (yet), but pose a high risk of interfering with PET recycling
Container	PET		PLA; PVC; PS; PETG
Size			
Colours	transparent, light colours	transparent, dark colours	opaque; metallic
Barrier	SiOx coating; carbon plasma-coating; PA multilayer with no tie layers; PTN alloy;	EVOH multilayer with < 3 wt% EVOH and no tie layers; PA multilayer with tie layers; monolayer PA blend; PGA multilayer ;	EVOH multilayer with >3 wt% EVOH or tie layers
Additives		UV stablilisers; AA blockers; optical brighteners; oxygen scavengers	bio-/oxo-/photodegradable additives; nanocomposites
Closure Systems	PE; PP; all with density <1 g/cm³		materials with density >1 g/cm³ (e.g. highly filled PE; metals);non-detaching or welded closures)
Liners, Seals and Valves	PE; PE+EVA; PP; foamed PET; all with density <1g/cm³	silicone with density <0.95g/cm³	materials with density >1 g/cm³ (e.g. PVC, silicone, metals)
Labels	PE; PP; OPP; EPS; foamed PET or PETG; all with density <1 g/cm³	lightly metallised labels (density <1 g/cm³); paper	materials with density >1 g/cm³ (e.g. PVC; PS; PET; PETG; PLA); metallised materials; non-detaching or welded labels
Sleeves	sleeves with partial bottle coverage in PE; PP; OPP; EPS; foamed PET or PETG; all with density <1 g/cm³	sleeves translucent for IR detection in PE; PP; OPP; EPS; foamed PET or PETG; all with density <1 g/cm³	materials with density >1 g/cm³ (e.g. PVC; PS; PET; PETG); metallised materials; heavily inked sleeves; full body sleeves
Tamper Evidence Wrap	PE; PP; OPP; EPS; foamed PET or PETG; all with density <1 g/cm³		materials with density >1 g/cm³ (e.g metal; PVC; PS; PET;PETG); metallised materials
Adhesives	water or alkali soluble in 60-80°C.	hot-melts	pressure-sensitive labels; self adhesive labels
Inks	non toxic; follow EUPIA Guidelines		inks that bleed; toxic or hazardous inks
Direct Printing	laser marked	production or expiry date	any other direct printing
Other Components	base cup, handles or other components which are separated by grinding and float/sink - all with density <1 g/cm³; PET		materials with density >1 g/cm³ (e.g. metal, RFID tags); non-detaching or welded components

Recycled Content - Recommendations

- **New CEN Standard detailing process for designers to maximise recycled content**
- **Process to include, as a minimum:**
  - **Visual appearance**
  - **Mechanical properties**
  - **Legal considerations, e.g. food contact**
- **Possibility of EPR modulation, but not the most appropriate given EPR focus on achieving recycling targets efficiently**
- **Targets for specific formats/ sectors e.g. transport packaging/ e-commerce packaging**

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EU Measures already in place

- **Recycling Targets:**
  - New recycling targets for plastic packaging 50% (2025); 55% (2030).
  - Harmonised measurement method for all EU recycling targets which will make the targets more difficult to achieve
  - Separate collection of plastic beverage containers with 77% by 2025 and 90% by 2029
- **Extended Producer Responsibility:**
  - Requirement for full cost recovery under EPR (so increases in costs for producers in many countries)
  - Obligation to vary EPR fees paid by producers according to recyclability of packaging (etc.)
  - For specific single use packaging items, EPR fees need to cover clean-up of litter
- **Reductions in Use**
  - Food containers used to contain food that is consumed without further preparation
- **Eco-design**
  - Mandatory tethering of caps for plastic beverage containers

EU Measures already in place

- **Recycled Content**
  - 25% recycled content for PET beverage bottles by 2025 and 30% for all beverage bottles by 2030. Separate collection of plastic beverage containers with 77% by 2025 and 90% by 2029.
- **Circular Plastics Alliance making progress towards similar, and in some cases, overlapping objectives**

Taxes on plastic in Europe

- **Italy: €450/t** from July 2021 (compostables exempt)
- **UK: £200/t** on plastic packaging with recycled content below 30% (challenging for food contact) *(highly likely)*
- **EU: €800/t** unrecycled plastic packaging

EU Measures in the Pipeline

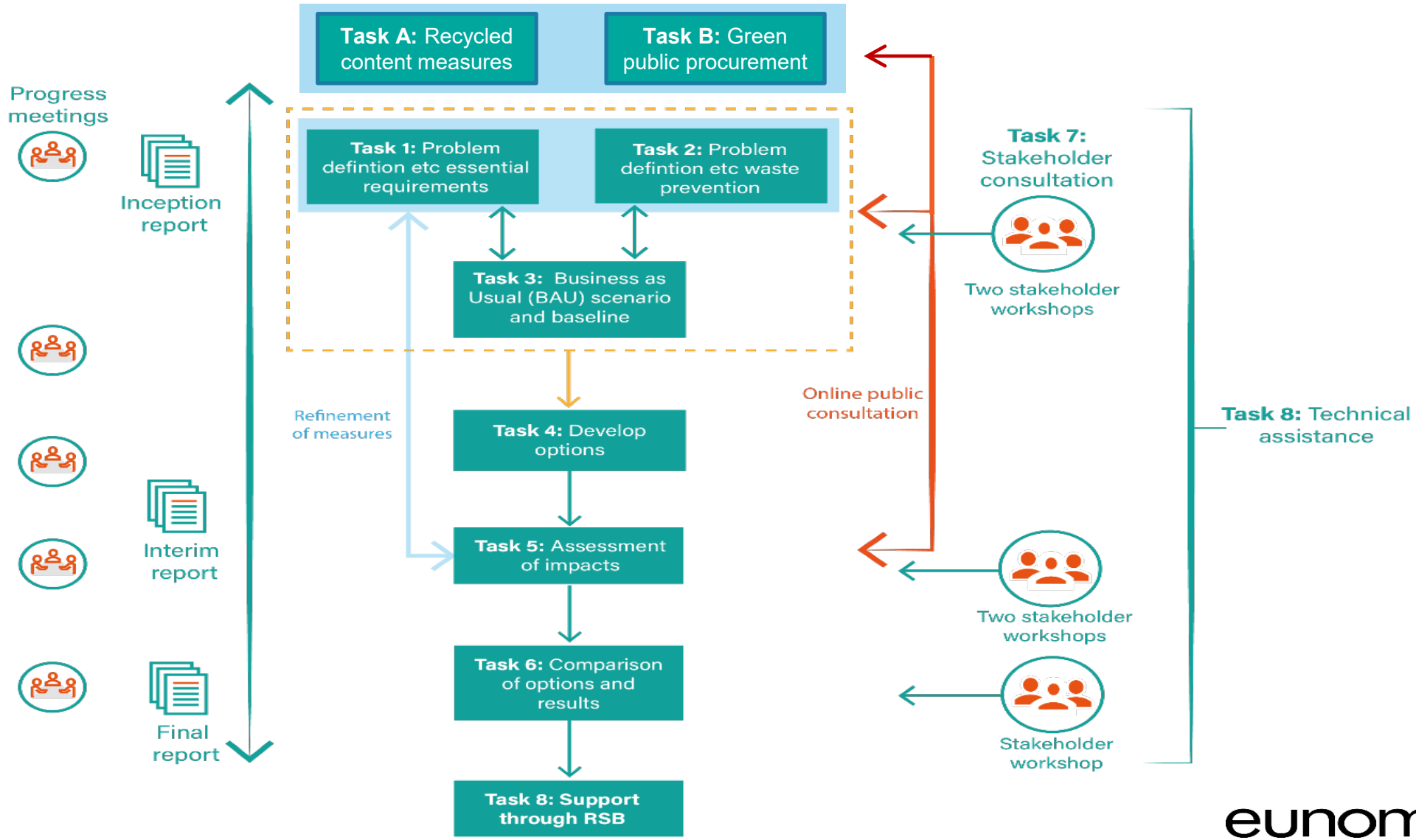
- All plastic packaging recyclable / reusable by 2030;
- Increase reuse; reduce overpackaging;
- Recycled content (not only plastic drink bottles);
- Framework for bio-based and compostable plastics
- Link action on plastic packaging to climate change

PPWD Review Impact Assessment - Objectives

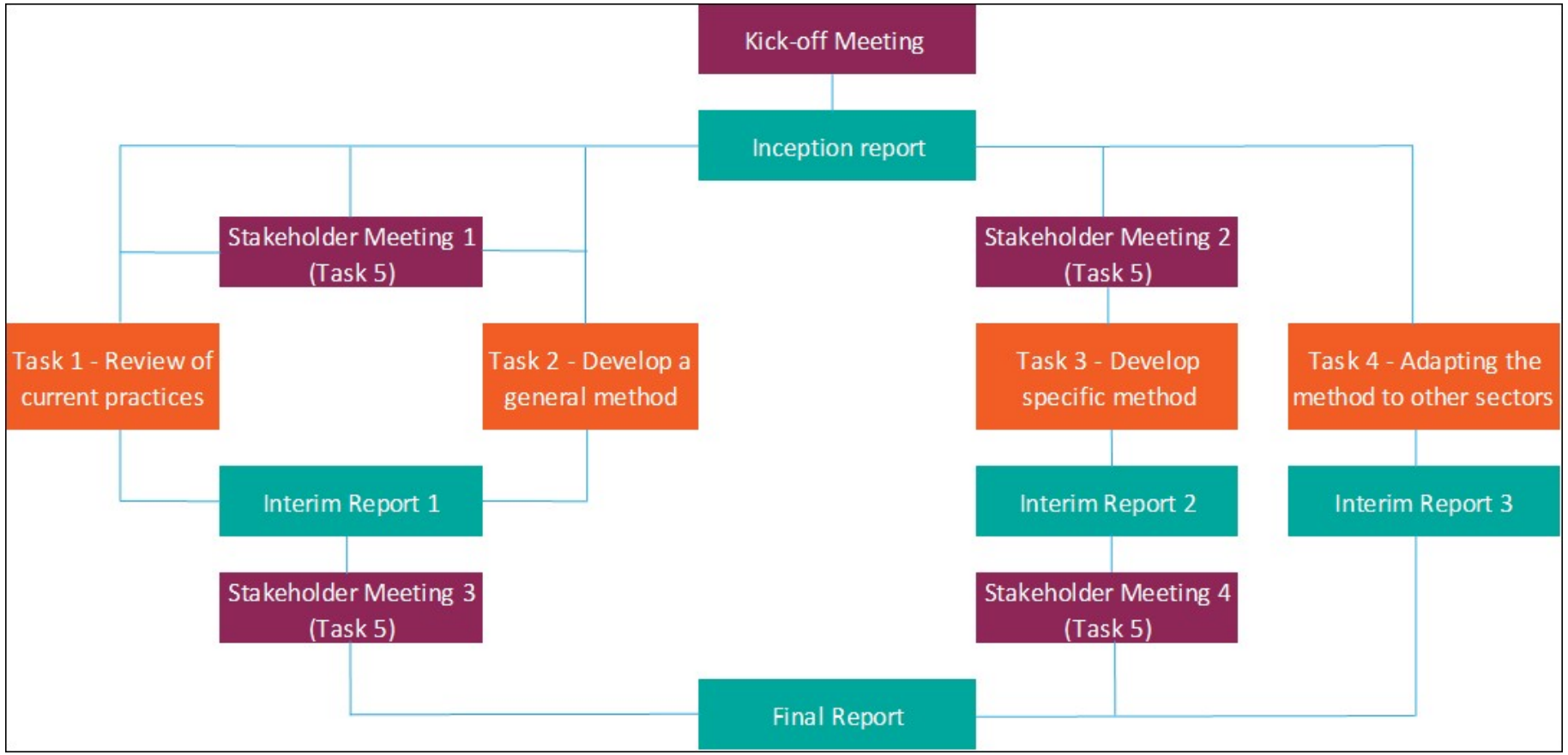
"The overall purpose of the study is to assist the Commission in developing and assessing a set of options to:

- ***Reinforce the Packaging and Packaging Waste Directive's Essential Requirements;***
- ***Achieve an absolute reduction in packaging waste generation."***

PPWD Review Impact Assessment - Approach



Recycled Content Measurement Method - Approach



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Recycled Content Measurement Method - Objectives

"The contract has the following three objectives:

- ***Development of a general method for the calculation, verification and reporting of recycled content of plastics;***
- ***Defining and detailing the method for the general area of single use plastic beverage bottles...;***
- ***Adapting the method to relevant policy areas other than SUP."***

Key Takeaways

- **Packaging will be at the forefront of policy driving circularity across the European economy**
  - Mandatory requirements (recyclability, PRC…)
  - Cutting edge EPR
  - Targets that test the art of the possible
    - In the current paradigm at least….
  - New measures to drive packaging to the top of the hierarchy (reduction, reuse)
- **A lot of detail to resolve, but direction of travel is clear… so time to align and engage positively**

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Design for Recycling Guidelines

Questions & Answers session

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

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Thank you for your participation

Next webinar:

Recyclability Methodology

November 17, 11 am to 12 pm

More information to follow

www.recyclass.eu