Packaging innovation vs. Design for Recycling

An Vossen – Executive Manager

plarebel

2015 Conference on Canadian Stewardship
30 September 2015

Plarebel

- PLAREBEL is a non-profit organisation that promotes the recycling of all plastic waste types in Belgium. Its members represent the entire plastics industry supply chain (producers, converters and users).
- PLAREBEL is a partner of Fost Plus (ie. Belgian Green Dot organisation), acting as a centre of expertise with regard to the organisation of the collection and sorting, the recycling of household plastic packaging waste in Belgium; thus contributing to an efficient implementation of the recycling activities in Belgium.
- PLAREBEL is member of EPRO (European Association of Plastics Recycling and Recovery Organisations).

plarebel

INNOVATION

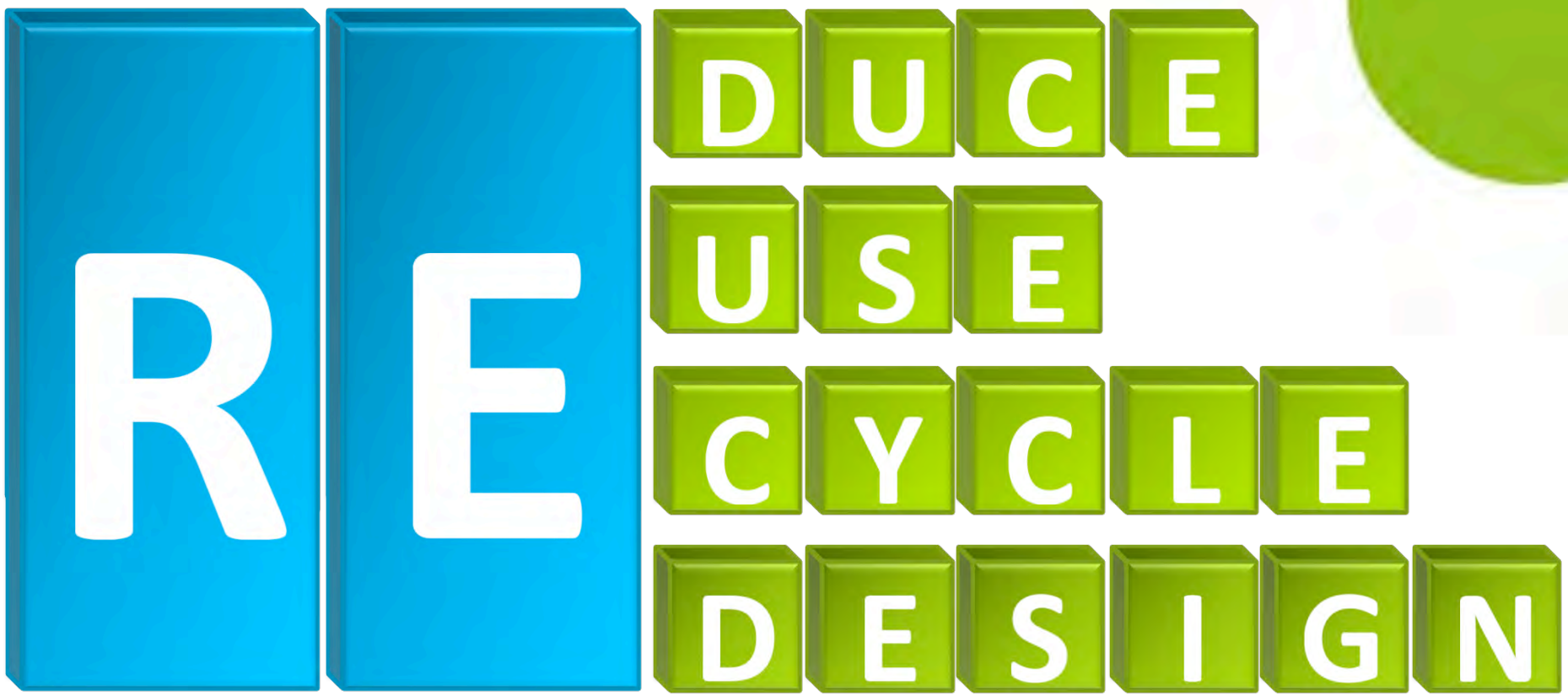
The process of translating a new idea or invention into a good or service that creates value or for which customers will pay.

RECYCLING

Waste minimization strategy in which reusable materials are diverted from a waste stream and processed in order to regain material for the manufacture of new products.

plarebel

plarebel



plarebel

MAKE PRODUCTS MORE RECYCLABLE

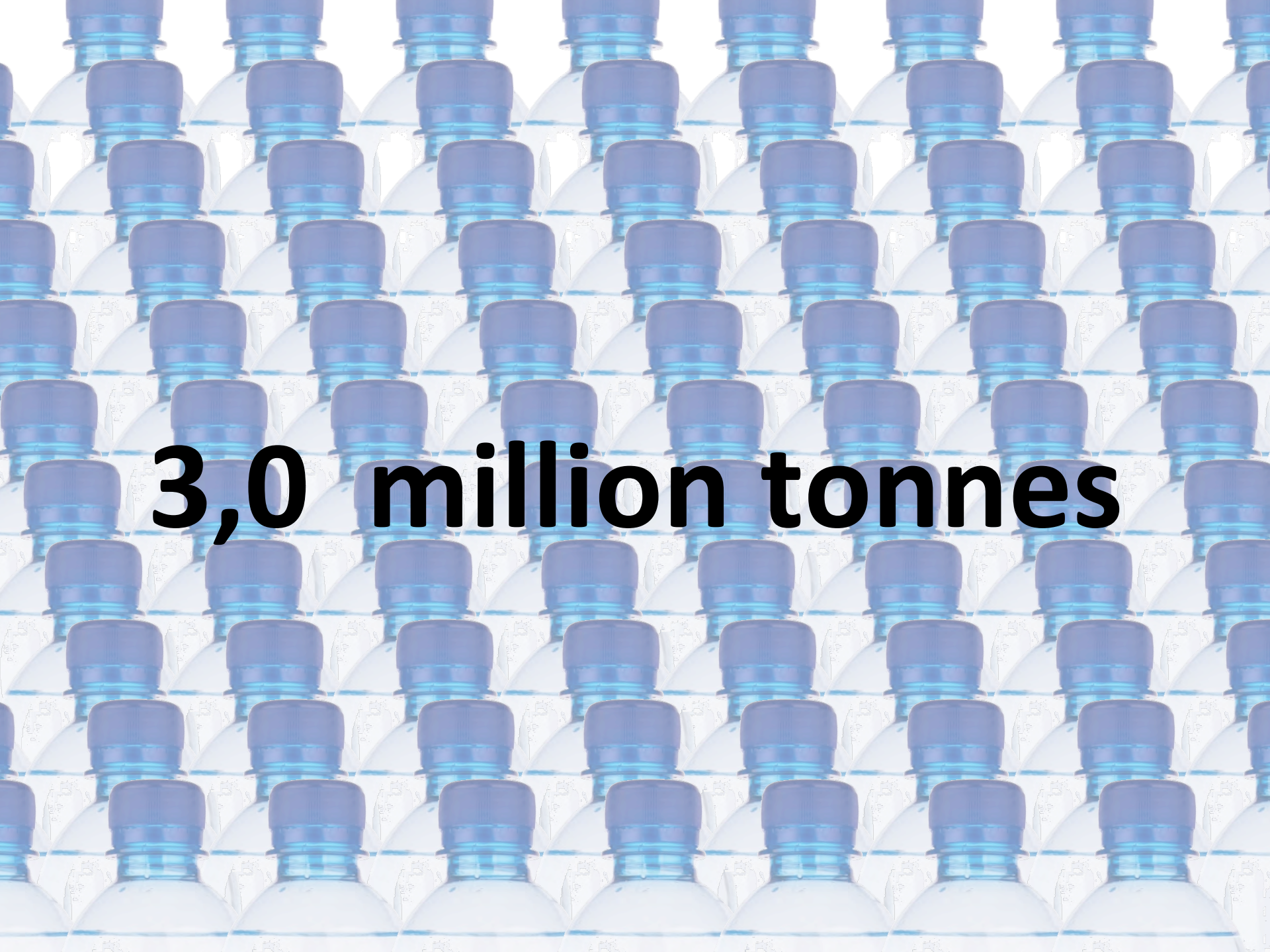
plarebel

Design for Recycling (DfR)

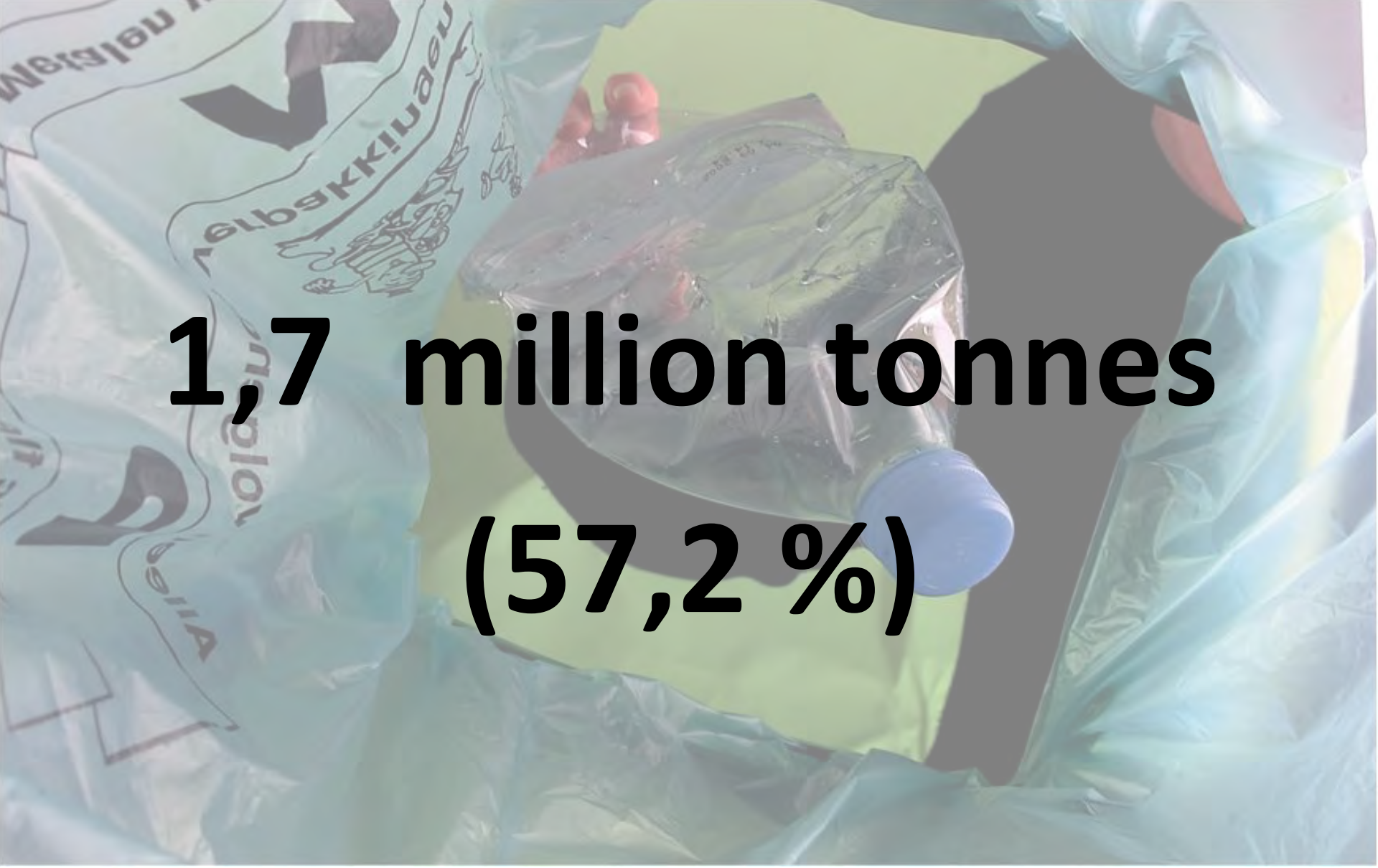
- Design for Recycling is a design concept that seeks to remove hazardous and non-recyclable materials from the production process through careful planning and design in order to promote material loops.
  - removal of toxic and hazardous substances
  - use of mono-materials
  - use of compatible materials
  - easy dismantling and separation
  - identification of materials that are difficult to recognise
- Design for Recycling helps protect the environment and creates a sustainable means for conserving our resources.

plarebel

plarebel


3,0 million tonnes

plarebel



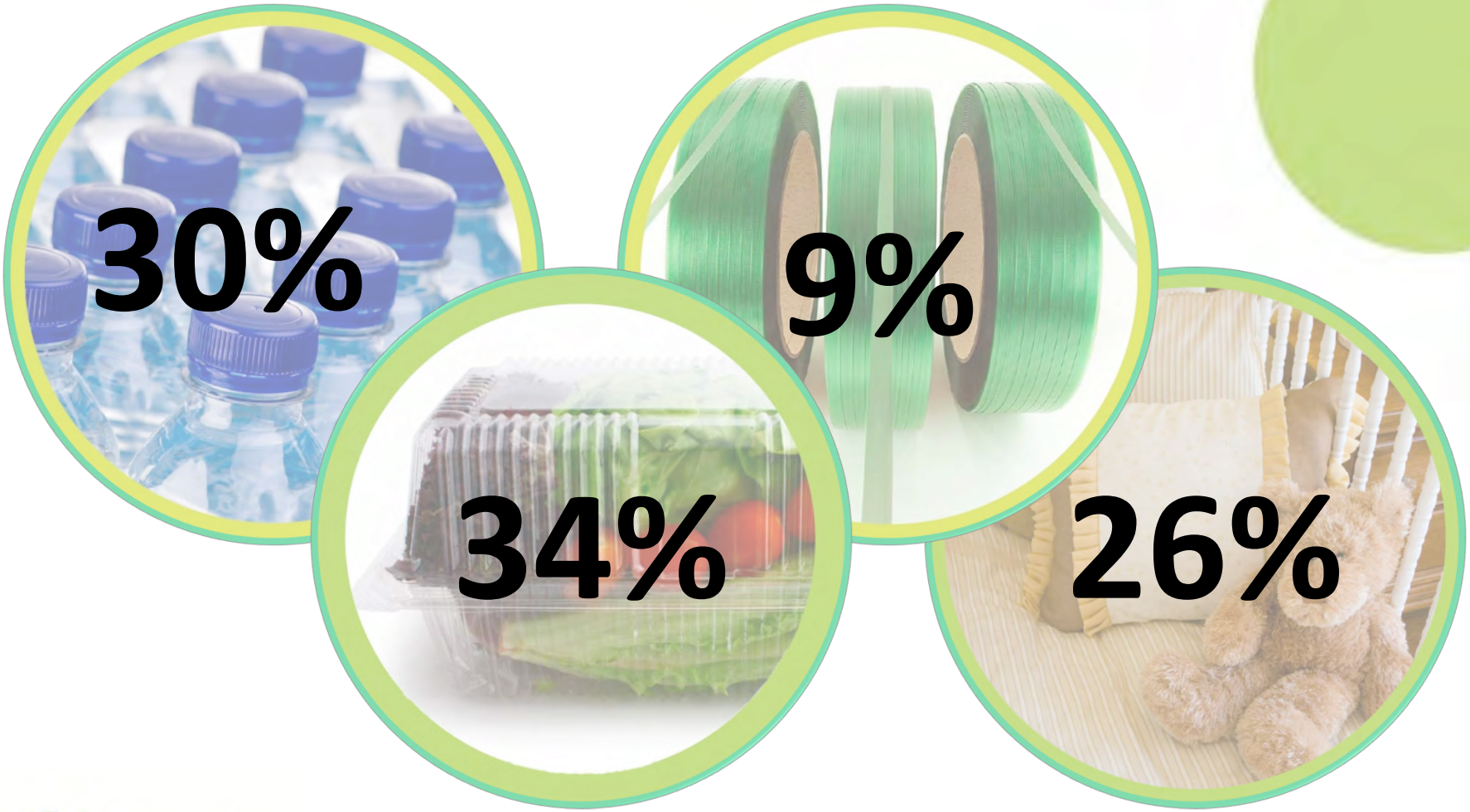
1,7 million tonnes

(57,2 %)

plarebel

PET

plarebel



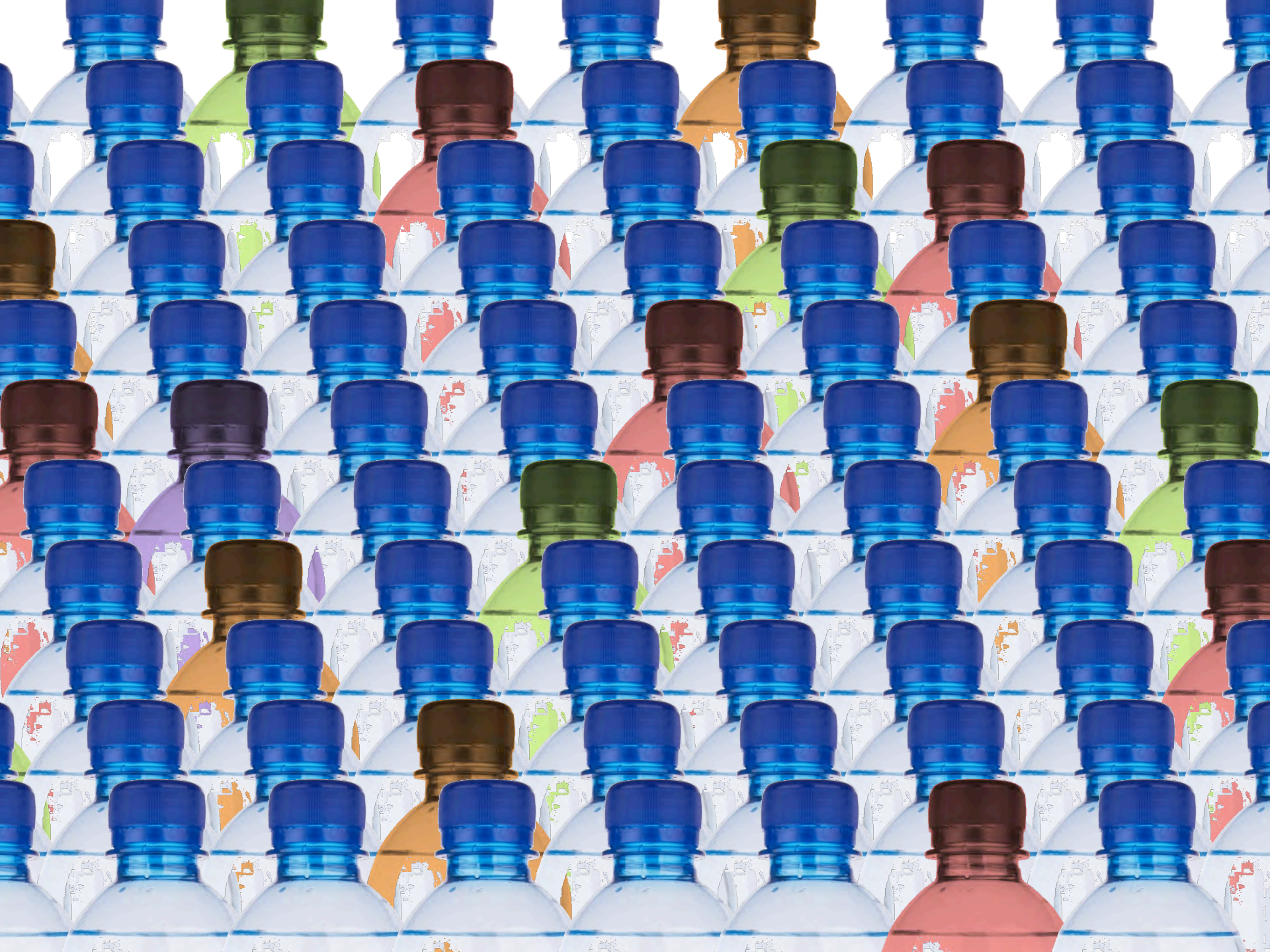
plarebel

Time to reflect…

plarebel

- Size & shape
- Weight
- Resin grade
- Colorants
- Barrier technologies
- Additives
- Caps & closures
- Liners, seals & valves
- Labels & sleeves
- Adhesives
- Inks
- Other components

plarebel



plarebel

EPBP

- Is a **voluntary** initiative
- Created in **2007**
- Grouping **technical experts** in the field of PET production, design, use, collection and recycling
- To provide an **objective evaluation** of the impact of new technologies on PET recycling processes across Europe.
- **Supported by** the European Association of Plastic Recycling and Recovery Organisations (EPRO), the Plastics Recyclers Europe (PRE), PETCORE-Europe, the European Federation of Bottled Waters (EFBW) and the European non-alcoholic beverages association (UNESDA).

plarebel

- EPBP has established several **test procedures** in order to assess the recycling profile of new PET bottles, including barriers, additives, closures, labels, etc.
- The first set of test procedures are relatively rapid and low-cost techniques for the **quick assessment** of the recycling profile of PET bottles, including oven test, optical sorting test, glue separation, etc.
- In addition, the Platform establishes specific test procedures using **up-to-date testing methods** that produce qualitative and/or quantitative test results.
- For more information, visit www.petbottleplatform.eu.

- EPBP has established several **test procedures** in order to assess the recycling profile of new PET bottles, including barriers, additives, closures, labels, etc.
- The first set of test procedures are relatively rapid and low-cost techniques for the **quick assessment** of the recycling profile of PET bottles, including oven test, optical sorting test, glue separation, etc.
- In addition, the Platform establishes specific test procedures using **up-to-date testing methods** that produce qualitative and/or quantitative test results.
- For more information, visit www.petbottleplatform.eu.

Testing Protocol for PET Recycling Compatibility

EPBP has also developed a **test protocol** for testing innovative PET bottles. This protocol is designed to evaluate PET packaging solutions that generally end up in the PET recycling stream and that can possibly influence the quality of - or even disturb - the recycling system. Our experts will use the information provided by the applicant, combined with its expertise and knowledge database, to determine the optimal test program, using up-to-date testing methods that produce qualitative and/or quantitative test results. Products that pass the tests should not experience any problems during recycling.

Process steps		
Pellets		
Bottles		
Grinding		
Washing		
Air elutriation		
Flakes		
Flake mixing (2, 5, 10, 25 and 50% test)		
Extrusion to pellets		
Route 1	**Route 2**	**Route 3**
Solid stating for Colour	Solid stating for 0.80 IV	Crystallization pellets
Pellet blending (50/50)	Pellet blending (50/50)	Fibre spinning
Injection Molding plaques	Injection Molding Preforms	Film extrusion (gels/specks)
Testing Plaques on colour	Blow molding bottles	
	Testing bottles	

EPBP

- EPBP has assessed **the impact of several innovations** on the PET recycling stream. These assessments are based upon tests carried out according to the EPBP testing protocol.
- Applicants must demonstrate that materials and/or components used in PET bottles can be **recycled safely and economically**, using existing recycling technologies and processes, by eliminating or significantly reducing materials that may impede recycling without affecting the yield or the quality of the recycled PET.
- To date EPBP has considered **more than 40 applications**. Many are ongoing, but there are 16 so far on the positive list.

plarebel

- EPBP focuses on some **key principles of the Design for Recycling Guidelines** that are appropriate for all PET bottles. These include:
  - Avoid the use of materials and/or components that are known to impede the PET recycling process or reduce the quality of the recycled PET.
  - Reduce the amount of non-PET components to allow for ease of separation and efficiency of recycling.
  - Design components, such as closures and labels, so that they can easily, safely, cost-effectively and rapidly be separated and eliminated from the recycled PET.
  - The goal of improving the recyclability of PET bottles cannot compromise product safety.

Design Guidelines

Please select a product from below:

Clear / light blue PET bottles

Coloured PET bottles

	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 clear; transparent light blue	. .	other transparent colours; opaque; metallic
Barrier	SiOx plasma-coating	carbon plasma-coating; PA multilayer with <5 wt% PA and no tie layers; PGA multilayer ; PTN alloy	PA multilayer with >5 wt% PA or tie layers; monolayer PA blend; EVOH
Additives		UV stabilisers; 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 <1 g/cm³	silicone with density <0.95 g/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

- Recommendation for the PET users:
  - EPBP design guidelines are freely available to individuals, designers and manufacturing companies.
  - It is essential that packaging designers follow the guidelines for recycling which are available on the EPBP website.
  - Companies are encouraged to bring their bottle packaging solutions to EPBP in order to obtain an objective third party assessment of the impact on recyclability and hence sustainability of their products.
  - Packaging solutions are assessed by the EPBP technical expert panel whilst protecting applicant's confidential information.

EPBP

Members | Test Procedures | Test Results | Design Guidelines | Downloads | News | Contact Us

Member Login

avossen@plarebel.be

password

Log In

Forgot your password?

Please check the EPBP website

www.petbottleplatform.eu

for the Design for Recycling Guidelines, the endorsements (including its conditions), and the test protocols.

plarebel


multi-
packs
film
>A4
film
met aluminium
geplast. papier
film <A4
shoppers
PET
PP
PS
PP
PS
PET
PET
PP
Film <A4
PET/
karton
CHAVROUX
CHAVROUX
PS
PE
PS
PS
PE
PS
PLA
PP

plarebel

Thank you for your attention !

An Vossen
Executive Manager

PLAREBEL
Diamant Building
Boulevard A. Reyerslaan 80
1030 Brussels
Belgium

Tel: +32 2 239 97 81
Fax: +32 2 238 99 98
Mail: info@plarebel.be