

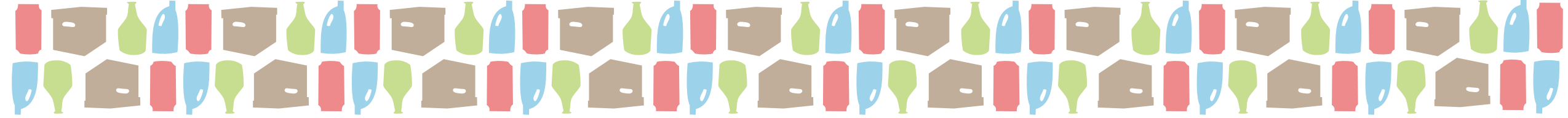


Netherlands Institute for Sustainable Packaging

Circular packaging design *The impact of design details on sustainability*

Packaged Summit 2019

Niels van Marle



Introduction

Session title:

Circular packaging design

The impact of design details on sustainability



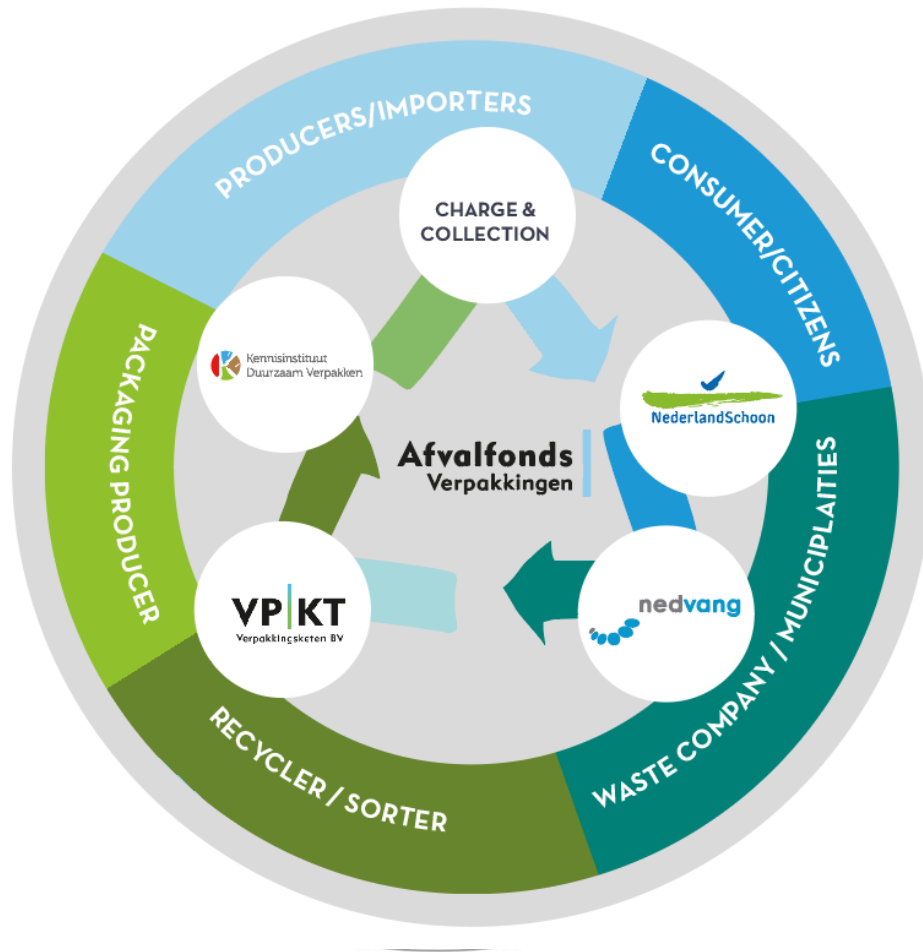
Session abstract:

Sustainable packaging requires customization. When designing packaging, the choices you make have consequences for the circularity of packaging. **Begin with the end in mind** and think about usage and dispose behavior of consumers. The Netherlands Institute for Sustainable Packaging will give you tips and tricks to make your packaging more sustainable.

KIDV staff



Introduction and position of the KIDV



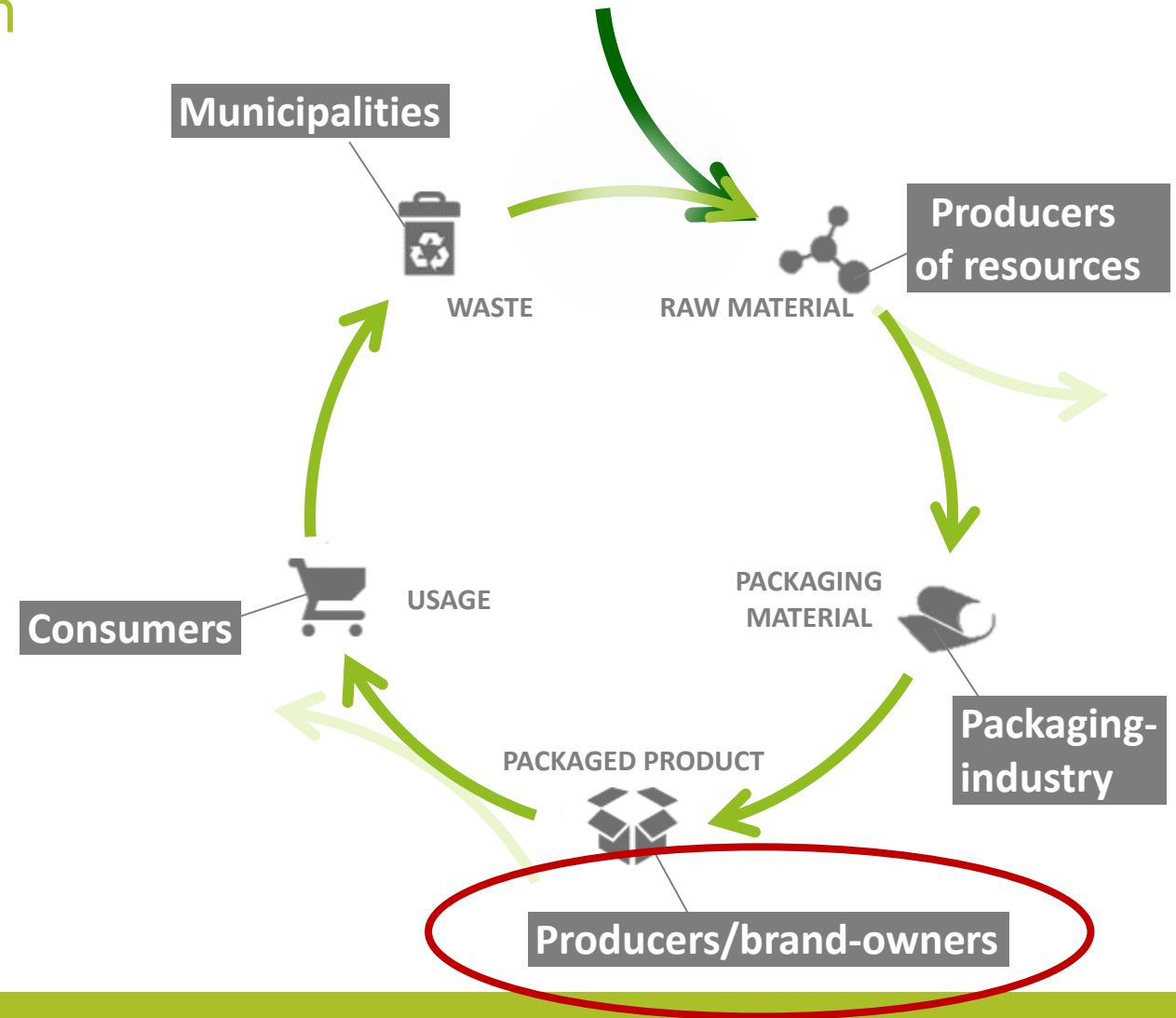
- Netherlands Institute for Sustainable Packaging (KIDV)
- Founded in 2013
- Reduce the environmental impact of packaging in relation to the packed products
- A part of producer responsibility system
- Creating knowledge through research to close the loop for packaging materials and contribute to a circular economy

Our position in the packaging chain

Working along the product and packaging value chain

Core business of KIDV:

- Initiating and conducting research
- Translating knowledge in hands-on tools for companies
- Supporting companies in their transition towards sustainable packaging
- Stimulate new circular initiatives



KIDV - activities



Build knowledge base for sustainable packaging



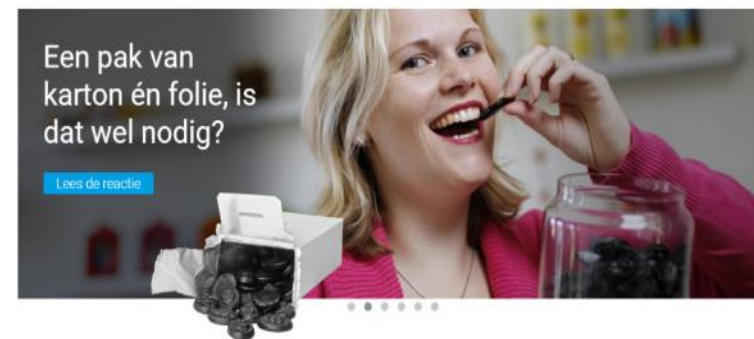
Advise and support to companies



Research program with experts and universities



Community of Sustainable Packaging Innovators (start-ups and scale-ups)



Packaging Hotline

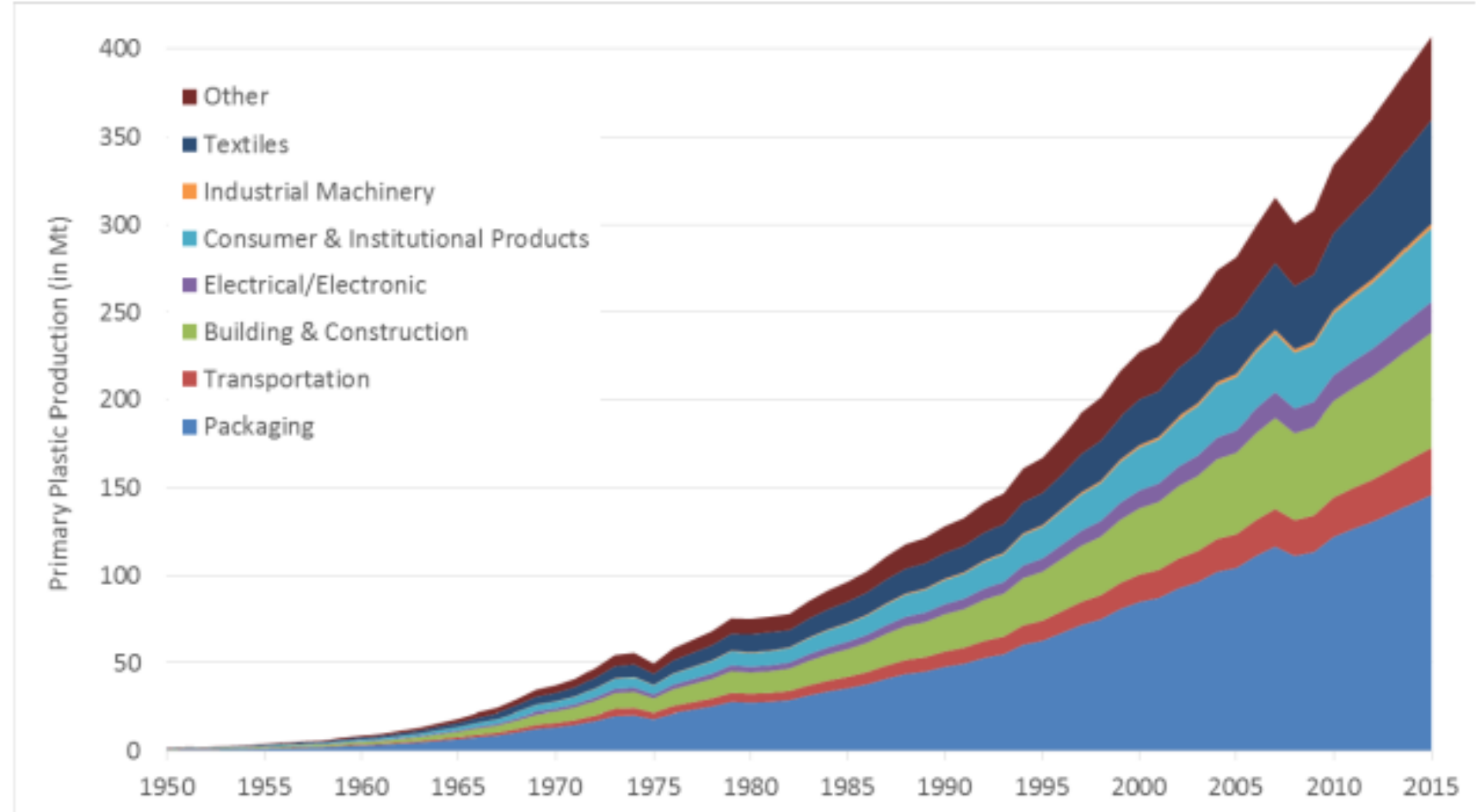


Sustainability goals for Industry sectors



Global urgency

Figure 1. Global plastics production: 1950 to 2015



Source: Geyer, R., J. Jambeck and K. Law (2017), "Production, use, and fate of all plastics ever made", *Science Advances*, Vol. 3/7, p. e1700782, <http://dx.doi.org/10.1126/sciadv.1700782>.

Social pressure

PLASTIC ATTACK



**Eerste 'Plastic Attack' in België
viseert Delhaize in Brussel**

MILIEU BRUSSEL-STAD 03/4/2018 PSZ DELEN: f t e



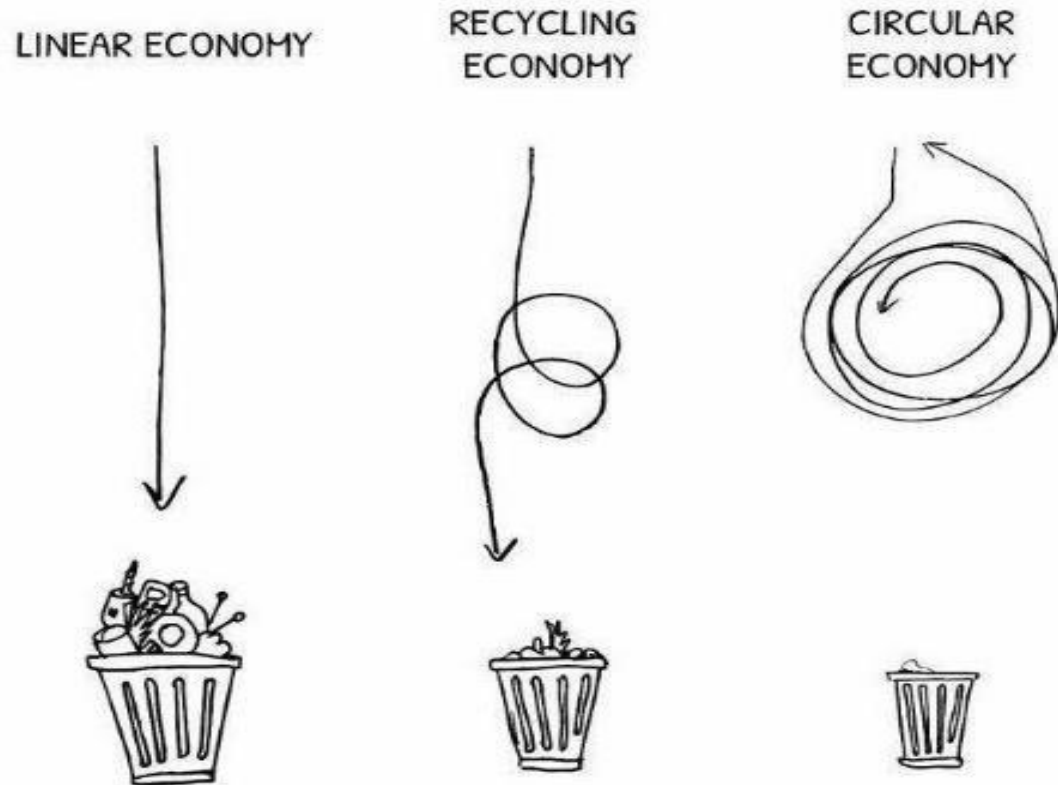
foto: Gerard Stolk

Klanten AH vallen plastic aan tijdens Plastic Attack

vrijdag 20 april 10:04 - 2018

BREDA - Sta je er wel eens bij stil hoeveel plastic afval je verzamelt na het doen van boodschappen? Aanstaande zondag wordt hier met een 'Plastic Attack' in Breda aandacht gevraagd voor de plasticvervuiling. Bij de Albert Heijn in de Nieuwstraat laten deelnemers van de actie de overbodige plastic verpakkingen na het boodschappen doen achter in de winkel.

Circular economy as a strategy

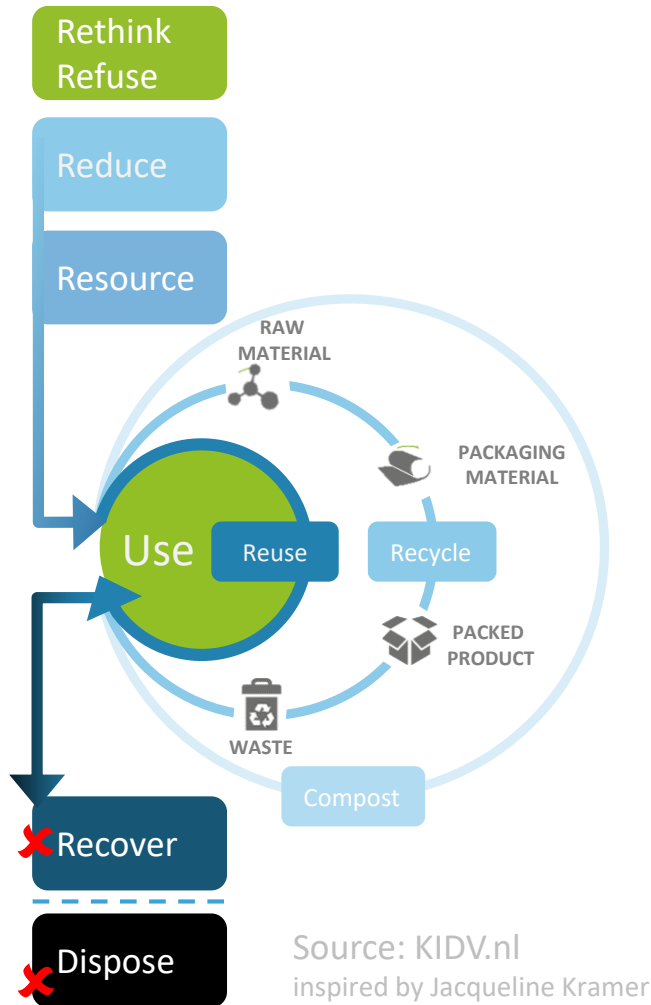


‘A circular economy is one that is restorative and regenerative by design and aims to keep products, components and materials at their highest utility and value at all times’

(MacArthur, 2015)

How do retailers and industry sectors react under public pressure?

2025	% Reduce the use of plastic	% Recycled content	% Recycleble
AH	25		100
Aldi	30		100
Lidl	20		100
CBL	20	25 50% rPET trays	95
FNLI	To be determined	50% rPET trays	95



More Circularity =

- reduce material usage and
- reduce environmental impact
- eliminate waste

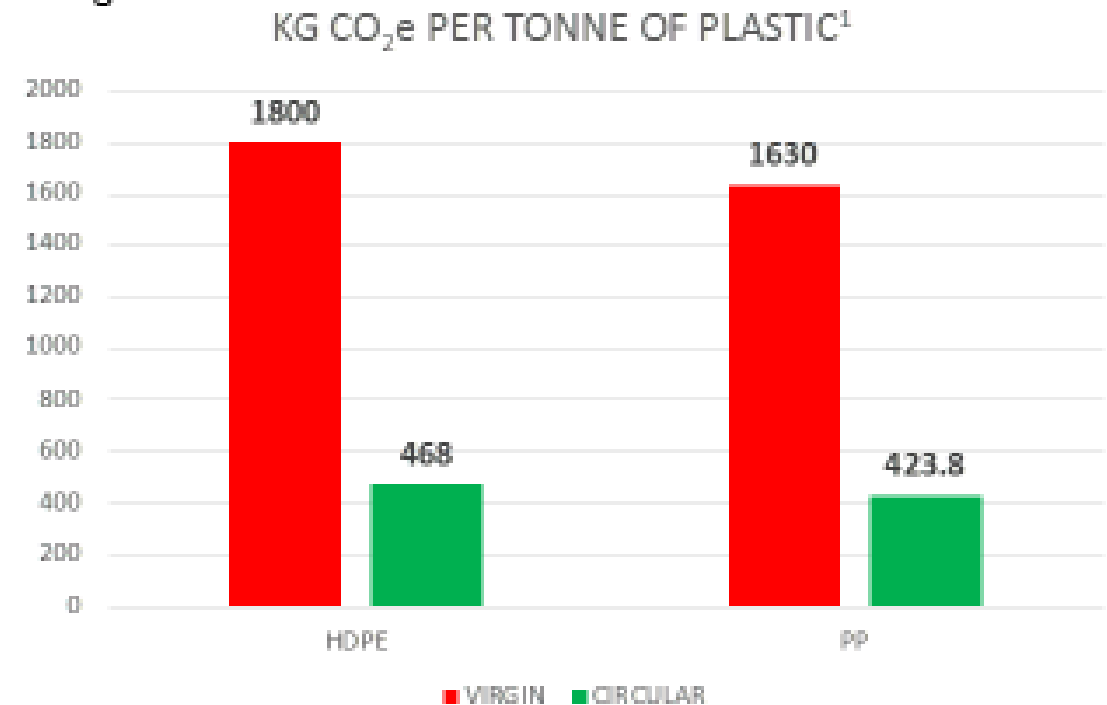
Industry targets:

- **Reduce:** Less material
- **Resource:** The right material (no harmful substances / biobased / recycled content)
- **Recycle:** More recycling and better quality

ADVANTAGES VS VIRGIN POLYMERS

The impact of recycling

- SOLUTION TO PLASTIC WASTE PROBLEM
- Lower fossil-fuel dependency
- 75% CO₂ reduction vs Virgin



¹) LCA analysis performed conform ISO 14040/14044

The LCA includes all the raw materials used to produce the resin from OCP-gate but excludes the use and end-of-life phase

Recyclability is an important aspect in circularity, but....

What is recycling?



Packaging design



Collection



Sorting

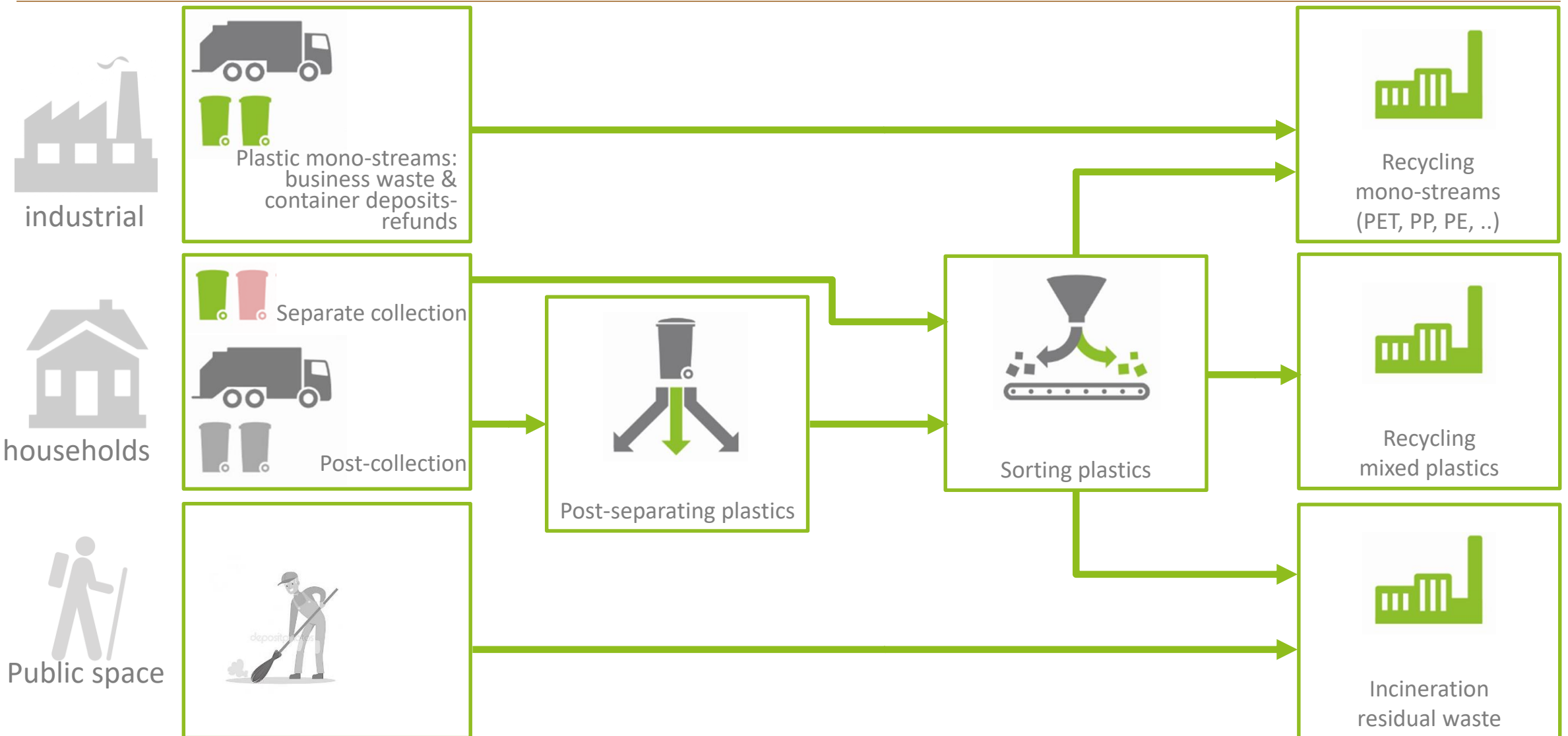


Recycling



Output

Packaging in their context of usage





Design to POS



separation at source and post-collection

Residual waste

Non-sorted waste

Rigid plastics

Plastic film > A4

Plastic mix

Steel

Aluminum

Beverage cartons

Plastics, Metals, Drinking cartons (PMD)

Energy

Steel

Aluminum

HDPE

PP

PET bottle

PET-tray

mainly LDPE

Mix incl. rigid and flexible

Steel

Aluminum

Paper

Sorting output



Design to POS



separation at source and post-collection

Residual waste

Non-sorted waste

Rigid plastics

Plastic film > A4

Plastic mix

Plastics, Metals, Drinking cartons (PMD)

Energie

Staal

Aluminium



HDPE

PET-tray

PP

PET bottle

mainly LDPE

Mix incl. rigid and flexible

Sorteerfractie



Black colored packaging



Can not be sorted

Design to POS



Separation at source and post-collection

Residual waste

Non-sorted waste

Rigid plastics

Plastic film > A4

Plastic mix

Plastics, Metals, Drinking cartons (PMD)

Energy

Steel **Aluminum**


HDPE **PET-tray**




PP **PET bottle**

mainly LDPE

Mix incl. rigid and flexible

Sorted fraction



What does this mean in practice?



Collection:

- Where is the packaging material disposed? In home, in the office or out of home?
- Is it disposed as one entity or as separate components?
- Does the pack, or separate component fulfill the collection requirements?

Sorting:

- Does the material belong to one of the available mono-streams? PE, PP, PET, Metal, Paper, Glass
- Are there disturbing factors that affect sortability?
Dimensions, color black, label size, full body sleeve, label material,

Recycling:

- Are there disturbing factors that affect recycling quality?
Silicone, paper label, PVC, PVDC,



Packaging design

Collection

Sorting

Recycling

Output

KIDV Recyclecheck



- Current practice in collection, sorting and recycling in the Netherlands, and referring to European situation.
- Commonly used processes
- Decision tree; answering questions y/n that are related to the entire packaging chain.
- At least the primary component of the pack can be recycled
- There are no influences that frustrate collection, sorting and recycling or pollute material streams.
- Currently only available for rigid plastic packaging. Others are work in progress: flexible plastic packaging; paper and carton; glass and metal packaging
- The recyclecheck can be downloaded via www.kidv.nl:
<https://www.kidv.nl/8142/kidv-recyclecheck-voor-vormvaste-kunststof-verpakkingen.html>

Design detail that impacts recycling



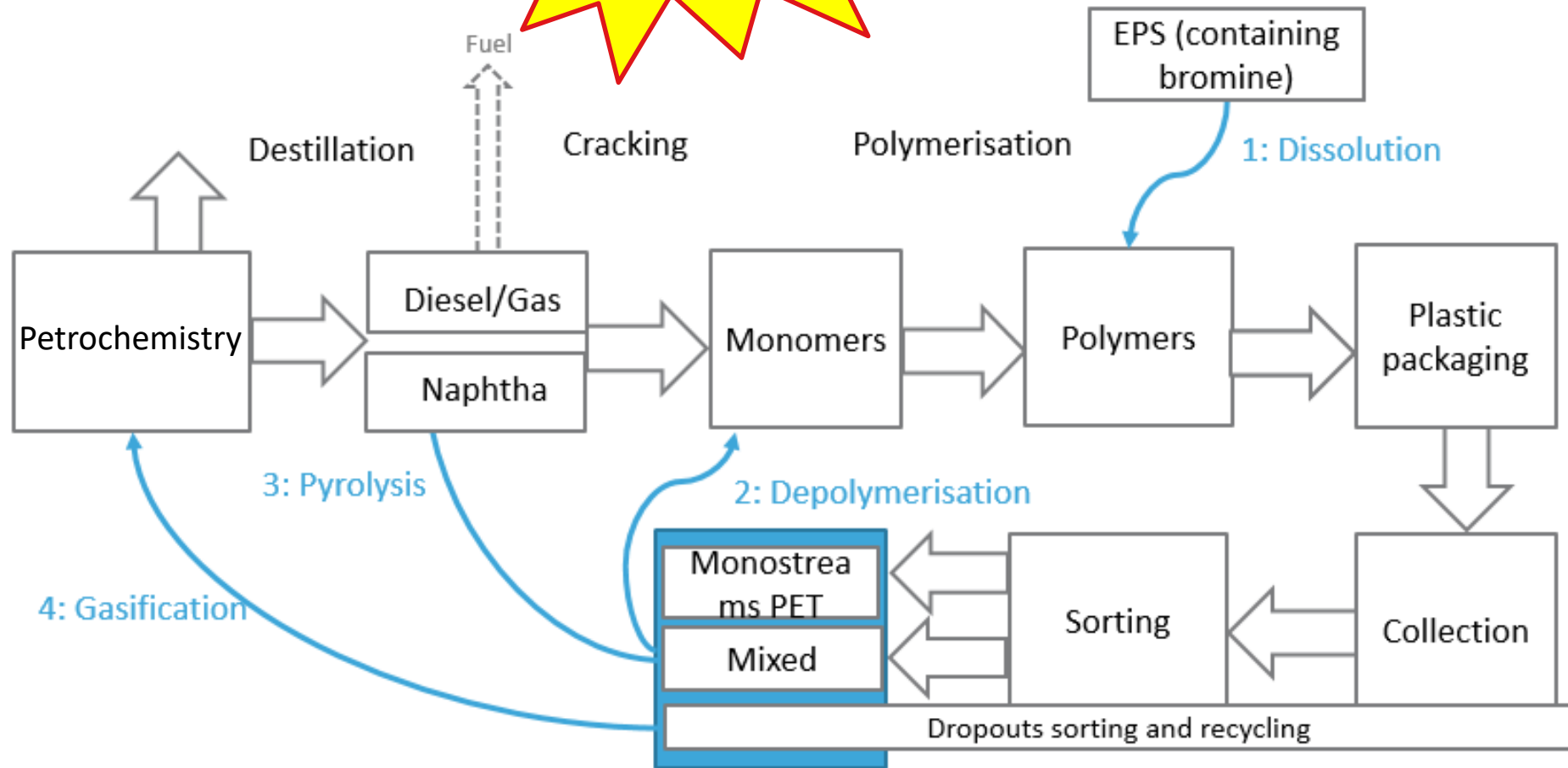
FIGUUR 6: VOORBEELD AFMETINGEN ETIKETTEN < 500ML EN ≥ 500ML VERPAKKINGEN

Materiaal van de grootste component	Materiaal van het etiket, label of de sleeve	Sorteerbaar?	Recyclebaar?	Conclusie:
PET	PET	Ja	Nee	Nee
	Papier, PE of PP met oppervlak etiket, label of sleeve >50% bij <500ml, >70% bij ≥500ml	Nee	Nee	Nee
	Papier, PE of PP met oppervlak etiket, label of sleeve <50% bij <500ml <70% bij ≥500ml	Ja	Ja	Ja

TABEL 3: HULPTABEL BEOORDELING RECYCLEBAARHEID TOEGESPASTE ETIKETTEN, LABELS OF SLEEVES OP PET



Will chemical recycling be the magic solution and change everything just presented?



KIDV 5 perspectives on sustainable packing



The packaging and the product

- Product protection
- Product safety
- Effective product usage

Policy and strategy

- Laws and regulations
- Sector developments
- Organisational policies and sustainability
- Business models and future scenarios

Consumer behaviour

- Purchasing behaviour
- Usage
- Disposal behaviour

Packaging in a circular economy

- The transition to a circular economy
- In-depth look: the plastic packaging chain
- Collection and recycling
- Measuring sustainability

Choice of material / packaging process

- Material usage and raw materials
- Packaging process
- Packaging systems
- Logistical efficiency

Tool for circularity assessment of packaging material
Status - in development



materiaal	✘
sorteren	✘
recyclen	✘
✓	





Netherlands Institute for Sustainable Packaging

Thank you for your attention!

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