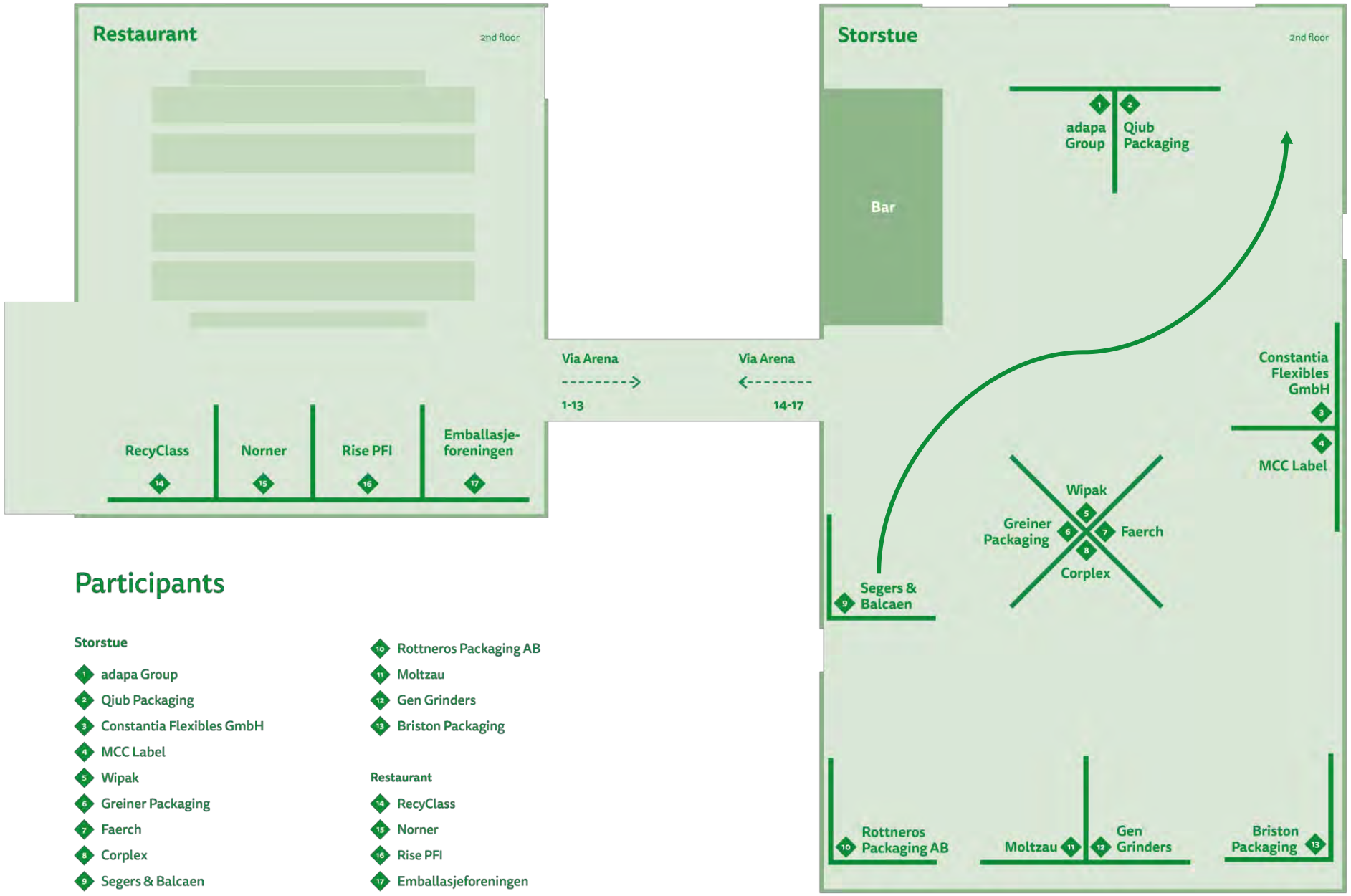
PACK FOR THE FUTURE

Velkommen - Welcome



Thank you Verpact, Fost Plus and Wageningen University & Research!



Participants

Storstue

1. adapa Group
2. Qiub Packaging
3. Constantia Flexibles GmbH
4. MCC Label
5. Wipak
6. Greiner Packaging
7. Faerch
8. Corplex
9. Segers & Balcaen
10. Rottneros Packaging AB
11. Moltzau
12. Gen Grinders
13. Briston Packaging

Restaurant

14. RecyClass
15. Norner
16. Rise PFI
17. Emballasjeforeningen

Filming og bilder

Program

11.00 Faglig program

CEN-guidelines an PPWR recyclability rules: What's the next step
Vincent Colard, CITEO

PPWR: An update on recyclability and recycled content
Henrik Nilsson, Näringslivets Producentansvar (NPA)

Att sätta pris på återvinningsbarhet
Love Pallon, Näringslivets Producentansvar (NPA)

Trygge valg i usikre tider: No-Regrets Playbook for emballasje
Bård Bringsrud Svensen, Grønt Punkt Norge

12.30 Lunsj

14.00 Faglig program

Preparing for PPWR: The Role of Pack for the Future
Karen van de Stadt, Verpact

How RecyClass Supports PPWR Targets and High-Quality Recycling
Nadir Mekki, RecyClass

Design-for recycling – what does it mean?
Ulphard Thoden van Velzen, Wageningen University & Research

Harmonisering av plastemballasje
Johannes Daae, Grønt Punkt Norge

The future of plastic sorting
Lisa Höflechner, Tomra



PPWR RECYCLABILITY REQUIREMENTS AND CEN GUIDELINES, WHAT NEXT?
PLANNING, SCORING AND START MOVING

Vincent Colard – CEN WG10 convenor and Citeo Packaging Recyclability Manager

Citeo, a circular economy stakeholder

OUR STORY

CITEO
HOUSEHOLD
PACKAGING AND PAPER

CITEO was set up 30 years ago by companies from the fast-moving consumer goods and retail sector to **reduce the environmental impact of their packaging and paper.**

We take on **their responsibilities and obligations in relation to Expended Producer Responsibility**, on a non-profit basis.

Our aim is to help them to use
100% circular reduced packaging

SUPERVISED RESPONSIBILITY

We ensure that the EPR scheme is implemented to a high standard and continually improved.

- 200 obligations governed by the **specifications**
- Activities are monitored by a **Government Controller** which is **routinely audited**
- We work under the **supervision** of **ADEME** and an **Approved Coordinating Organisation** (OCA)

PPWR art 6



EUROPEAN
COMMISSION

Brussels, 30.11.2022
COM(2022) 677 final

2022/0396 (COD)

Proposal for a

REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

on packaging and packaging waste, amending Regulation (EU) 2019/1020 and Directive (EU) 2019/904, and repealing Directive 94/62/EC

(Text with EEA relevance)

{SEC(2022) 425 final} - {SWD(2022) 384 final} - {SWD(2022) 385 final}

EN EN

PPWR recyclability approach :

- Ban/authorization based on recyclability ☑
- PRO tariff modulation ☑
- Ban « recyclable » as a claim ☑
- Communication on grades A B or C ✖

PPWR brings new obligations about recyclability

2030
All packaging must be
« designed for recycling »

Grade A ≥ 95%	✓ **Authorized**
Grade B ≥ 80%	✓ **Authorized**
Grade C ≥ 70%	✓ **Authorized**
< 70% not designed for recycling	✕ **Banned**

Delegated act T1 2028

2035
All packaging must be
« recycled at scale »

Grade A ≥ 95% *	✓ **Authorized**
Grade B ≥ 80% *	✓ **Authorized**
Grade C ≥ 70% *	✓ **Authorized**
< 70% *	✕ **Banned**

* *respecting the « at scale » rule*

Delegated act 2030

2038
Recyclability minimum
threshold will be increased

Grade A ≥ 95% *	✓ **Authorized**
Grade B ≥ 80% *	✓ **Authorized**
Grade C ≥ 70% *	✕ **Banned**
< 70% *	✕ **Banned**

* *respecting the « at scale » rule*

Delegated act T1 2028

2028-2030, a transition period needed to move to the PPWR approach

French example : AGEC et QCE

COCET COTREP cerec

COTREV COTREM ALUTREC

2025

2028 2030

Delegated acts will be published but they don't enter into force yet

PPWR and CEN as reference

1 **Standard** on methodo and definitions

1 **standard** on sorting tests

15 **standards** plastic packaging

10 **standards** on cardboard, glass, metal and wood

Unsolved (yet) PPWR mysteries



Grading system

The JRC published a technical report by the end of 2026

Two consultations on the art6 delegated acts

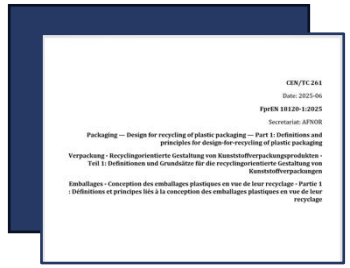
Publication in 2027 for entry into force in 2030?



PPWR Q&A

It creates unclarity on transport packaging vs sales & grouped.

A tape or a label will have its own grade (considered as a packaging unit at itself) for transport packaging but they are integrated component for others…

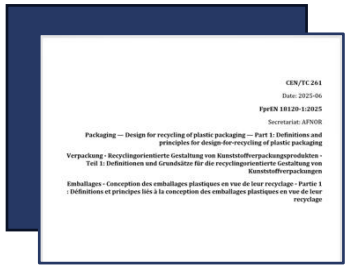


PPWR and standards

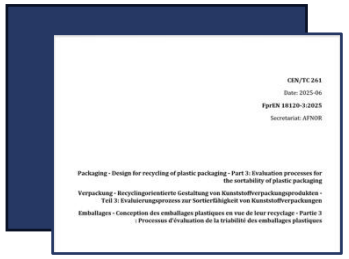
How calling the standards in the delegated acts ? Due to the PPWR wording, it’s not an easy task

Good news, the CE and the CEN accelerate in July on solutions

Available standards



EN 18120-1
Methodology and definitions



EN 18120-3
Sorting test



EN 18120-4 & 10
PET bottle



EN 18120-5 & 11
PET rigid



EN 18120-6 & 12
PE & PP rigid



EN 18120-7 & 13
PE & PP flexible



EN 18120-8 & 14
PS & XPS

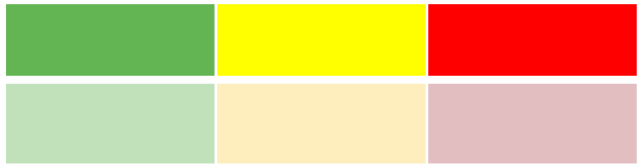


EN 18120-9 & 15
EPS



DFR guidelines and protocols for glass, metal, cardboard and wood packaging

How to move from CEN work to a grade?



Traffic light tables and protocols

Recyclability score

Recyclability grade

CEN TC261 SC4
WG3 and WG10

☑ Self assessment

✖ Test

✖ Certificat

Separate components – a key element in the analysis

By default, all components must be considered as integrated.

Packaging designer can prove the separation.

The separation must occur before the recycling process, due to consumer behaviors, a mechanical stress during the sorting stage or a dismantling step prior to recycling

Standards propose two methods for proving the separation:

1. **The component must be fully removed to access the product,** with a very low risk to put the component back in the packaging body after use.

   No test, self declaration form the designer

2. **A protocol with separation thresholds to reach** .

   Standards provide protocols

You have all the info to calculate a score with CEN documents



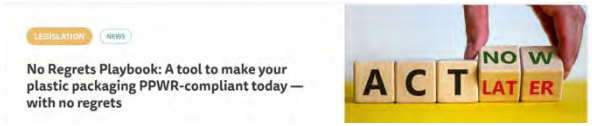
Full compatibility	Limited compatibility	Not compatible
PET body 22g		
PE cap 2g		
	Paper label without fiber loss* 1g Inks* 0,1g, adhesive* 0,1g	

% of recyclable materials in the bottle

$$\frac{(22 + 2)}{(22 + 2 + 1 + 0{,}1 + 0{,}1)} = \mathbf{95{,}2\%}$$

To conclude

How to start the travel?



No regrets playbook



Packforward members webinars

2030 is tomorrow. We help you to start in 2026 with:

Change your practices to describe a packaging based on PPWR approach

Move out packaging without recycling stream, with a low recycling score or a red part

Focus on packaging with a risk and enhance their design (>70% and green column)

Help us to update the CEN documents

Program

11.00 Faglig program

CEN-guidelines an PPWR recyclability rules: What's the next step
Vincent Colard, CITEO

PPWR: An update on recyclability and recycled content
Henrik Nilsson, Näringslivets Producentansvar (NPA)

Att sätta pris på återvinningsbarhet
Love Pallon, Näringslivets Producentansvar (NPA)

Trygge valg i usikre tider: No-Regrets Playbook for emballasje
Bård Bringsrud Svensen, Grønt Punkt Norge

12.30 Lunsj

14.00 Faglig program

Preparing for PPWR: The Role of Pack for the Future
Karen van de Stadt, Verpact

How RecyClass Supports PPWR Targets and High-Quality Recycling
Nadir Mekki, RecyClass

Design-for recycling – what does it mean?
Ulphard Thoden van Velzen, Wageningen University & Research

Harmonisering av plastemballasje
Johannes Daae, Grønt Punkt Norge

The future of plastic sorting
Lisa Höflechner, Tomra

PPWR – spelplanen är på plats. Vad blir nästa steg?

Henrik Nilsson

21 oktober 2026

NÄRINGSLIVETS PRODUCENTANSVAR

Näringslivets Producentansvar (NPA)

- Producentansvarsorganisation (PRO) för förpackningar
- Ägs av branschorganisationer
- NPA sen 2024, tidigare FTI
- 16 000 producenter och 45 anställda
- Drivs utan privat vinstintresse

NPA:s ägare

DLF

SVENSK DAGLIG VARUHANDEL

SH Svensk Handel

1885 SVERIGES BRYGGERIER

SVL SPRIT & VINLEVERANTÖRSFÖRENINGEN

Varför PPWR?

- **Förpackningsmängderna ökar** trots tydliga mål för minskning.
- **Mål för materialåtervinning nås inte** – bara vissa material och vissa länder når upp till målen.
- Alla EU-länder har **egna lösningar på producentansvar**, vilket försvårar för företag som säljer sina varor i flera länder.
- **Återanvändbara förpackningar har minskat.**

Mål

- Minska förpackningsavfall
- Öka cirkularitet
- Främja EU:s inre marknad



Vad har egentligen hänt sedan den 12 augusti?

- Krav på dokumentation och märkning
- Gränsvärden för PFAS i livsmedelsförpackningar
- Företag som inte varit producenter tidigare har blivit producenter – och tvärtom…



NÄRINGSLIVETS PRODUCENTANSVAR

Någon av dessa är producent



Tillverkare



Importör



Distributör

NÄRINGSLIVETS PRODUCENTANSVAR

Vem är producent?

- Det är huvudsakligen det företag som utpekas som **producent** som har att uppfylla kraven i PPWR.
- Att bedöma vem som är producent enligt PPWR **är komplext och kan kräva bedömningar i flera led**, exempelvis av
  - hur förpackningen ska användas,
  - om förpackningen är en egen märkesvara (s.k. EMV där en handlare låter en tillverka en produkt med handlarens eget varumärke),
  - vilket land köparen befinner sig i och
  - om köparen är ett mikroföretag (färre än tio anställda och en årlig omsättning om maximalt 2 miljoner EUR per år)

Tidslinje

Artikel 6 & Artikel 7

2030 införs

- **Ny klassificering av materialåtervinningsbarhet – klass A-C. Förpackningar med mindre än 70 % återvinningsgrad förbjuds**.
- Minimistandarder för förpackningsdimensioner och tomma utrymmen i förpackningar
- **Krav på andel materialåtervunnet innehåll i plastförpackningar**
- Mål för återanvändning
- Mål för påfyllning av påfyllningsbara förpackningar

2038 införs

- Förbud mot förpackningar med materialåtervinningsbarhet i klass C

2028 införs

- Krav på märkningar på förpackningar
- Hotell-, restaurang- och catering-sektorn måste erbjuda återanvändbara förpackningar för avhämtning

2035 införs

- Bedömning av materialåtervinnings-barhet utifrån förpackningar storskaliga materialåtervinningsbarhet

2040 införs

- Ökade krav på materialåtervunnet innehåll i förpackningar
- Ökade återanvändningsmål

NÄRINGSLIVETS PRODUCENTANSVAR

Artikel 6 - Materialåtervinningsbara förpackningar

- Design för återvinning – Klasser för materialåtervinningsbara förpackningar
  - Inte bara plast
  - Delegerade akt den 1 jan 2028
    - Träder i kraft 24 mån efter publicering
- Materialåtervinningsbar i stor skala (RaS)
  - 55% för plast
  - Återvinningsbara i praktiken från 2035

Bilaga II, Tabell 3

Klass (RPG)	2030	2038
A	≥ 95%	≥ 95%
B	95-80%	95-80%
C	80-70 %	80-70 %
Ej återvinningsbar	< 70%	< 70%

Artikel 7 - Lägsta innehåll av återvunnet material i plastförpackningar

- 2030 eller +36 månader efter genomförandeakt träder i kraft
  - 30% Kontaktkänsliga – PET
  - 10% Kontaktkänsliga – Annat än PET
  - 30% Dryckesflaskor för engångsbruk
  - 35% Andra plastförpackningar
- Beräknat som ett medelvärde per produktionsanläggning och år

Producenterna behöver förstå vad som händer i hela kedjan

- Design för återvinning är viktigt.
- Men design räcker inte om förpackningen inte samlas in, sorteras och återvinns i praktiken.
- Kvaliteten på det material som kommer tillbaka in i systemet blir avgörande.
- Samverkan mellan producenter, kommuner, återvinnare och andra aktörer blir viktigare.



NÄRINGSLIVETS PRODUCENTANSVAR

Det är snart 2030…

Då kommer bland annat:

- Krav på innehåll av återvunnen plast
- Krav kopplade till förpackningars återvinningsbarhet/design för materialåtervinning
- Återanvändningsmål
- Krav som ska minska onödigt förpackningsavfall och tomrum
- Ytterligare krav på vissa engångsförpackningar.



4 saker att göra nu

1. Skaffa kontroll över förpackningsportföljen

- Vilka förpackningar sätter ni på marknaden?
- I vilka material?
- I vilka format?
- På vilka marknader?



2. Säkerställ data

- Har ni rätt information om:
- Material
- Vikt
- Komponenter
- Återvunnet innehåll
- Andra egenskaper…



3. Börja utvärdera designen

- Hur står era förpackningar sig mot de kommande kraven på återvinningsbarhet?



4. Följ utvecklingen – och börja samarbeta nu

- Alla detaljer är inte färdiga. Standarder, delegerade akter och genomförandeakter kommer att spela stor roll.



Ni behöver inte ha alla svar idag. Men ni behöver börja bygga förmågan att få fram svaren.

Sammanfattningsvis

1. Den 12 augusti var början – inte slutet.

PPWR införs stegvis under många år.

2. År 2030 kommer snabbare än man tror.

Beslut om material, design och förpackningslösningar behöver fattas långt innan kraven börjar tillämpas.

3. Börja med det ni kan påverka nu.

Kartlägg. Samla data. Utvärdera. Samarbeta.



NÄRINGSLIVETS PRODUCENTANSVAR

Tack!

NÄRINGSLIVETS
PRODUCENTANSVAR

Program

11.00 Faglig program

CEN-guidelines an PPWR recyclability rules: What's the next step
Vincent Colard, CITEO

PPWR: An update on recyclability and recycled content
Henrik Nilsson, Näringslivets Producentansvar (NPA)

Att sätta pris på återvinningsbarhet
Love Pallon, Näringslivets Producentansvar (NPA)

Trygge valg i usikre tider: No-Regrets Playbook for emballasje
Bård Bringsrud Svensen, Grønt Punkt Norge

12.30 Lunsj

14.00 Faglig program

Preparing for PPWR: The Role of Pack for the Future
Karen van de Stadt, Verpact

How RecyClass Supports PPWR Targets and High-Quality Recycling
Nadir Mekki, RecyClass

Design-for recycling – what does it mean?
Ulphard Thoden van Velzen, Wageningen University & Research

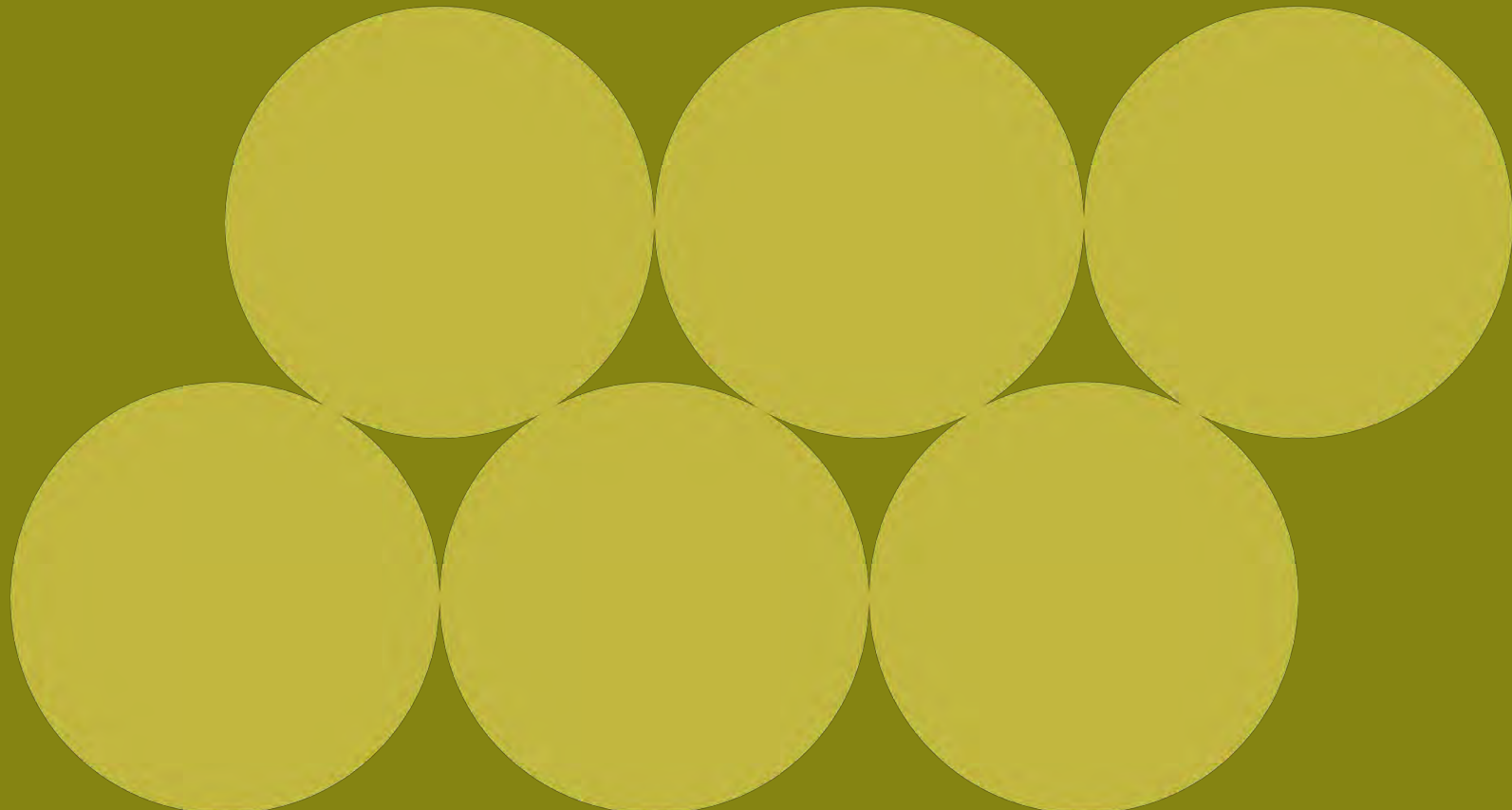
Harmonisering av plastemballasje
Johannes Daae, Grønt Punkt Norge

The future of plastic sorting
Lisa Höflechner, Tomra

Att sätta pris på återvinningsbarhet

Love Pallon

Materialspecialist



NÄRINGSLIVETS PRODUCENTANSVAR

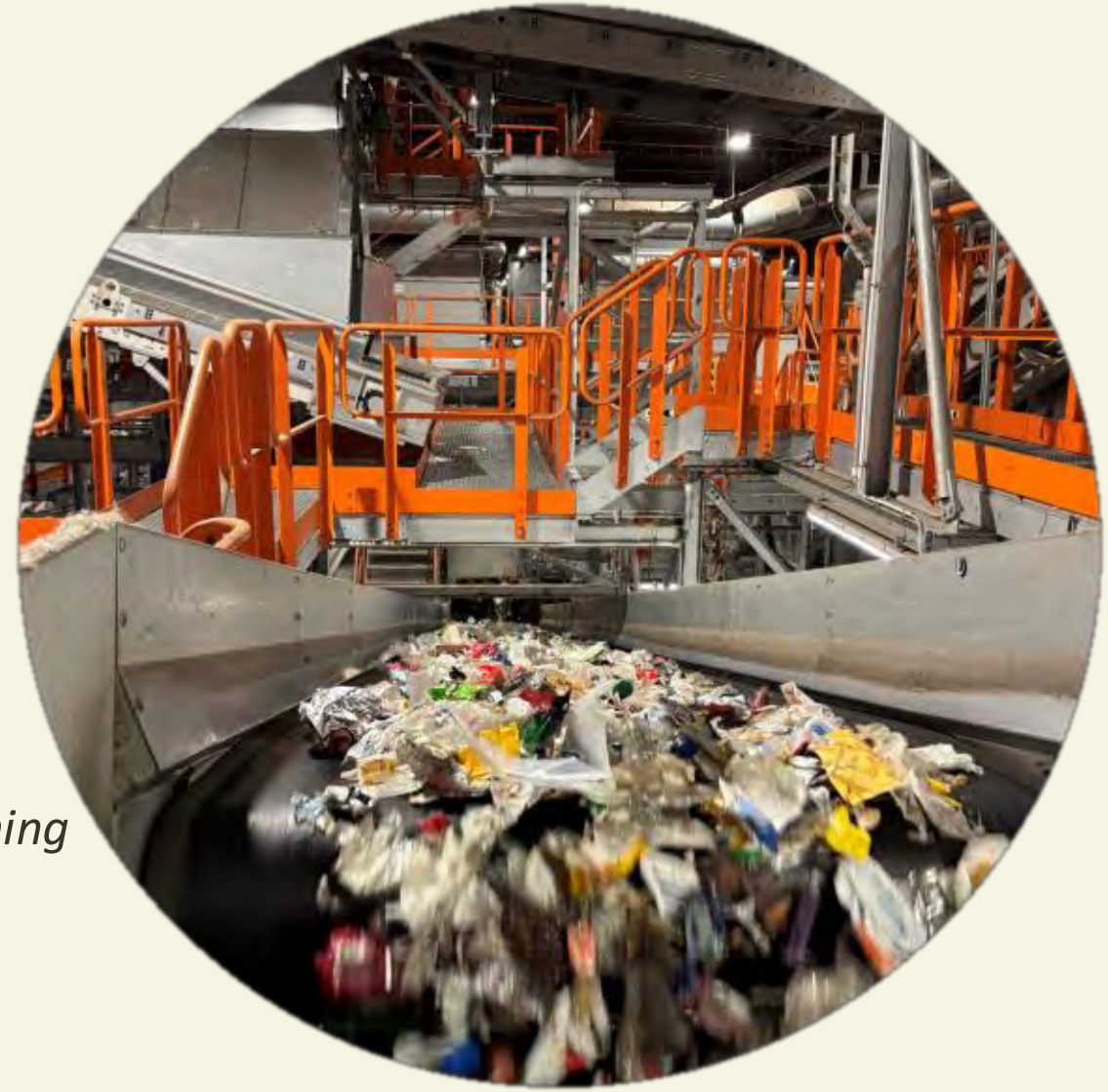
Bakgrund

- Ekomodulering genom differentierade avgifter
  - Plast - 2019
  - Papper - 2021
- Strategisk investering
  - Nationell sortering av plastförpackningar
- Nationell förordning för ekomodulering är begränsad
  - NFS 2022:11
- Konkurrensutsatt marknad för PRO:er



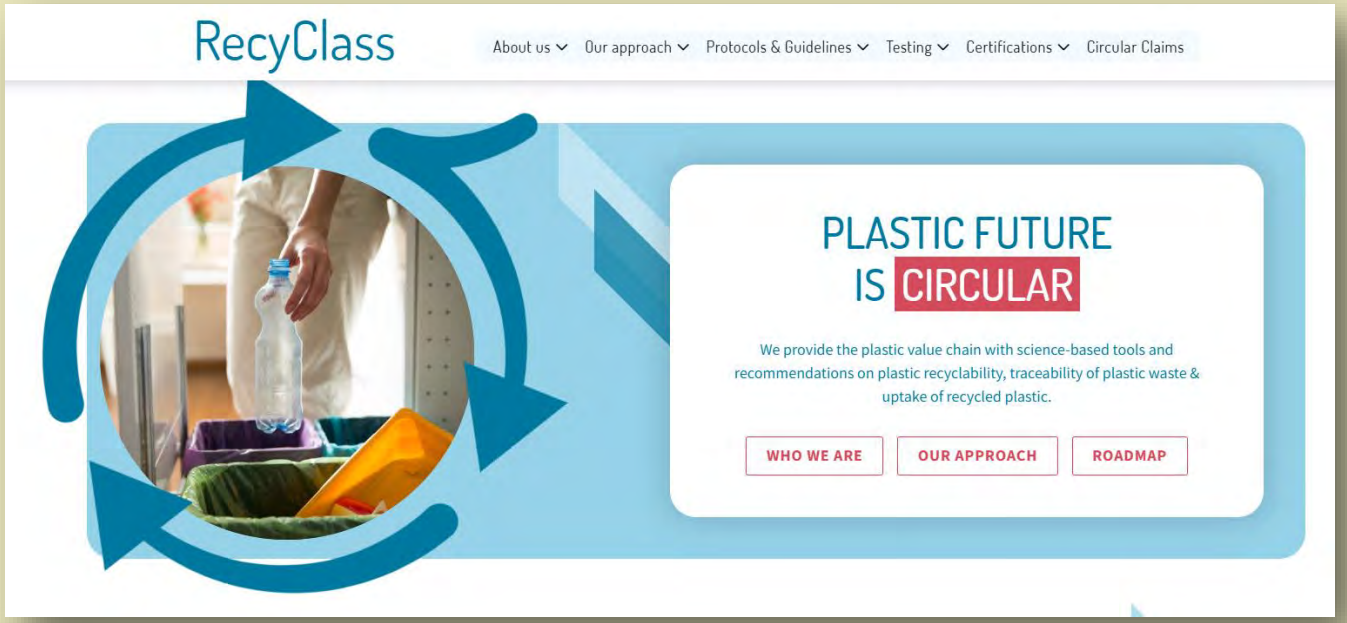
Nationell sortering

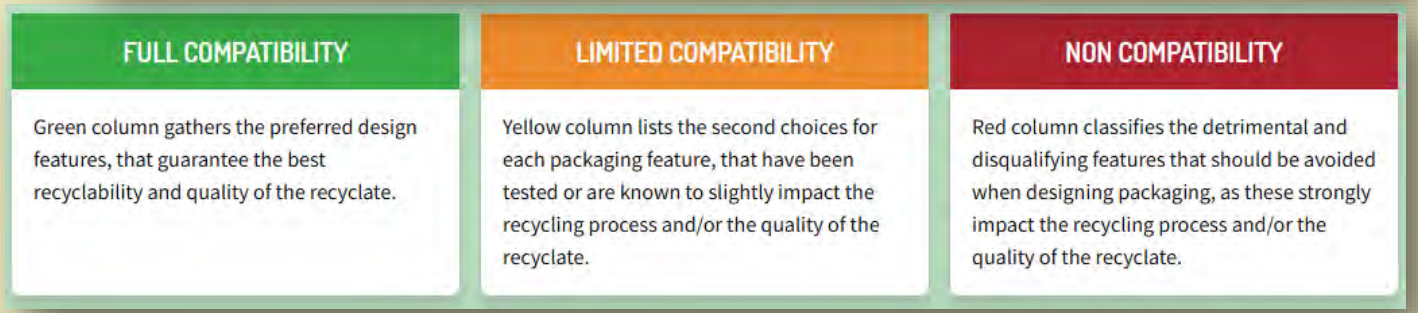
- Svensk Plaståtervinning (SPÅ)
  - Motala
  - 4 fraktioner - 2019
  - Site Zero - 2023
    - *12 fraktioner*
    - *Ambition om hög kvalité*
    - *Av RecyClass certifierade sorteringsanläggning*
- Kriterier har utvecklats över tid
- RecyClass-supporter sen 2023



RecyClass

- Icke vinstdrivande organisation
  - Plastic Recyclers Europe
- Att göra plast cirkulär
- Trafikljus-system
  - Tekniskt återvinningsbart
  - Kompatibilitet
  - 19 designtabeller för plast







NÄRINGSLIVETS PRODUCENTANSVAR

NPAs ekomodulering

- Kriterietabeller
  - 7 för Privat Bruk
  - 8 för Annat än Privat bruk
- Privat Bruk
  - Grön, Gul och Röd Avgiftsnivå
- Bedömning enligt kriterietabell
  - Ger avgiftsnivå
- Ingen hänsyn till funktion



Förpackningsmaterial
PP flexibel
PE flexibel
PP styv
PE styv
PS styv
PET (flaskor)
PET (termoformad)
EPS (Annat än Privat Bruk)

Art nr	Artikel	Materialåtervinning	
4110	Plastförpackningar	Förenlig med materialåtervinning	✓
4130	Plastförpackningar	Begränsat förenlig med materialåtervinning	✓
4150	Plastförpackningar	Ej förenlig med materialåtervinning	✗

Kriterier för ekomodulering

- Kombination av RecyClass och SPÅ
  - Ingen uppdelning i färg
  - Tryckarea istället för vikt%
  - Typ av tryckfärg
- Avvägning mot marknaden
- Förpackning bedöms på lägsta uppnådda nivån
- Självdeklarering



2. PE flexibel förpackning – Privat bruk			
	Den ideala förpackningen *Valet för en högkvalitativ materialåtervinning*	**Grön avgiftsnivå** Förenlig Privat bruk Art.nr. 4110	**Gul avgiftsnivå** Begränsad Privat bruk Art.nr. 4130
2.1 Material	·Flexibel PE monomaterial utan fyllmedel.	·PE (LDPE, HDPE, LLDPE, MDPE, MDOPE, BOPE, PE-g-MAH (tie layer)) med densitet ≤ 0,97 g/cm³ och ·Fyllmedelshalt (organiskt eller oorganiskt) ≤ 5 vikt%.	·PE (LDPE, HDPE, LLDPE, MDPE, MDOPE, BOPE, PE-g-MAH (tie layer)) med densitet ≤0,97 g/cm³ och - PE med ≤ 5 vikt% PP
2.2 Färg *Plastmaterialets infärgning/ pigmentering*	·Ofärgad, fri från pigment.	·Ofärgad, fri från pigment.	·Valfri färg förutom svart (undantag för svarta pigment som ej stör NIR-detektering, verifierat med sorteringstest*).
2.3 Tryck & Lack *Färgat eller ofärgat tryck, lack eller annan ytbeläggning*	·Minimera tryckytan och mängden tryckfärg (färgat eller ofärgat). Undvik nitrocellulosa (NC) som bindemedel.	·Max 60% av förpackningens ytteryta**, oavsett bindemedelstyp.	·Över 60% av förpackningens ytteryta**, oavsett bindemedelstyp.
2.4 Limmad etikett	·Undvik limmad etikett, mer lämpligt att trycka på en begränsad del av ytan (gäller endast flexibel förpackning).	*·Limmade etiketter omfattas inte i avgiftskriterierna i dagsläget.*	
2.5 Barriär	·Ingen barriär.	·PE-PE filmer, inkl. ett av följande barriärmaterial: - SiOx eller AlOx, utan ytterligare beläggning. - EVOH ≤ 5 vikt%. - Metallisering*.	- PE-PE filmer, inkl. ett eller flera av följande barriärmaterial: - SiOx eller AlOx, utan ytterligare beläggning. - EVOH ≤ 5 vikt%. - Lösningsbaserad EVOH ≤ 2 vikt%. - PVOH ≤ 1 vikt%. - Metallisering* - PA6/66 copolymer med smälttemp <192°C, ≤15 vikt%, samt med ≥10 vikt% PE-g-MAH tie layer.
2.6 Adhesiv-laminering	·Ingen adhesiv-laminering.	·Alifatisk polyuretanbaserat adhesiv ≤ 2,5 vikt%*** eller ·Adhesiv godkänt med full kompatibilitet av RecyClass ≤ 5 vikt%***.	·Polyuretanbaserat (alifatiskt eller aromatiskt) eller vattenbaserat akryladhesiv ≤ 5 vikt%***, eller ·Adhesiv godkänt med begränsad kompatibilitet av RecyClass***.
Förpackningar som ej uppfyller kraven för Grön eller Gul avgiftsnivå redovisas på Röd avgiftsnivå – Begränsat alt. ej förenlig med materialåtervinning. Privat bruk. Art.nr 4150			

NPAs ekomodulering

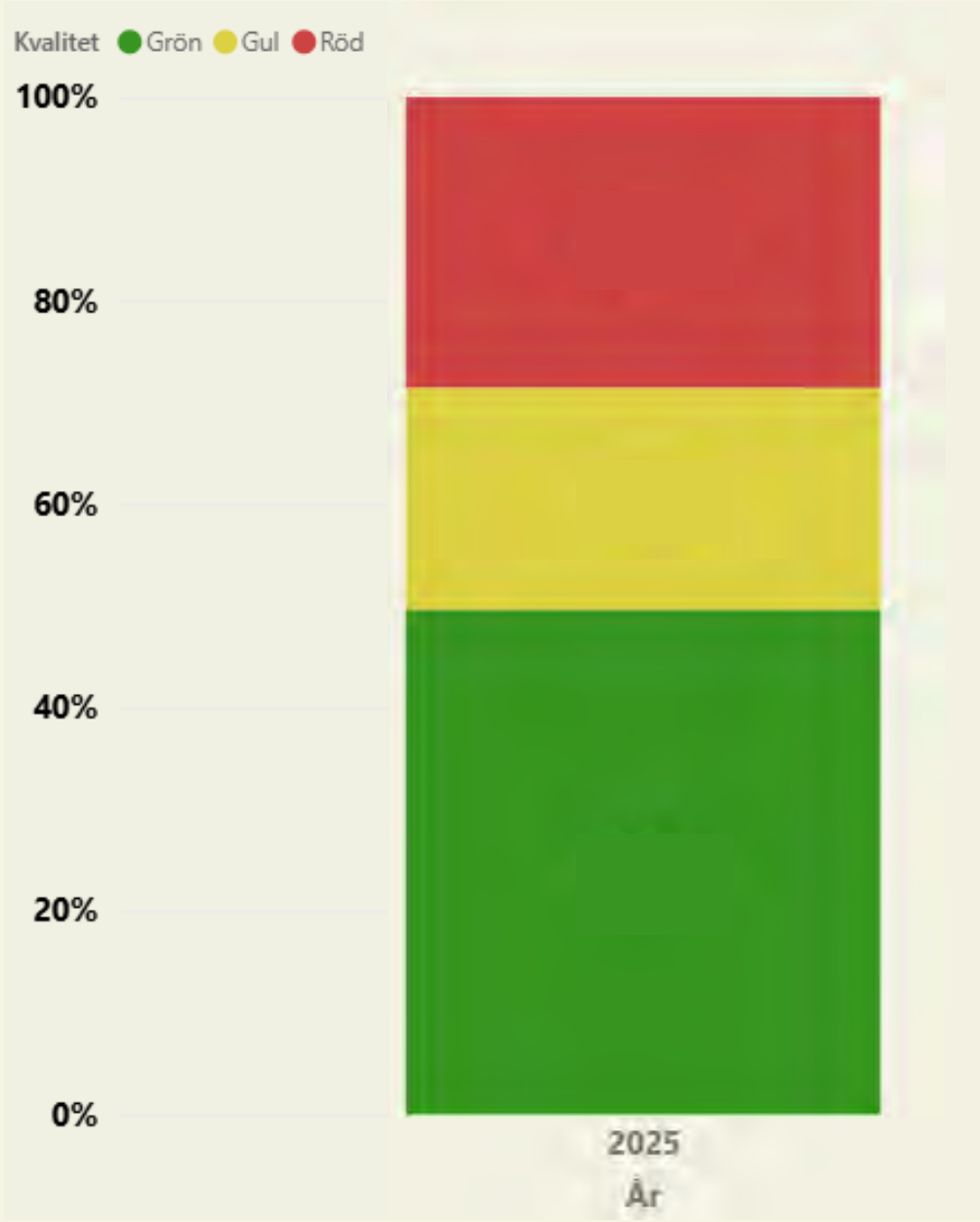
- Mer återvinningsbart ger lägre avgift
  - Grön klassning
    - *Rabatt tack vare inkomst för avsättning*
  - Röd klassning
    - *Extra kostnad p.g.a. dyr avsättning*
- Alla förpackningsplaster har samma avgifter
  - Inte skillnad på plasttyp



Fördelning 2025 - Design för återvinning

Privat bruk

- Grönklassade ≈ 50%
- Gulklassade ≈ 22 %
- Rödklassade ≈ 28 %
- Stabil fördelning över tid
- Självdeklarerat



NÄRINGSLIVETS PRODUCENTANSVAR

Vad händer efter SPÅ?

Återvunnen plastråvara
Inkommande mängd plastförpackningar

- Frukttråg
- Dryckesflaskor
- Tvätt- och diskmedelsflaskor
- Yoghurtburkar
- Färgburkar
- Schampoflaskor



- Bärkassar
- Avfallspåsar
- Blomkrukor
- Större kärl
- Städredskap
- Plastkomponenter till bilar och hushållsapparater



Återvinningsbidrag för plastförpackningar (%):
50,9
(2024: 46,1*)

Återvunna plastförpackningar (ton):
37 819
(2024: 30 651)

*

- Lastpallar
- Kabeltrummor
- Konstruktionsmaterial
- Syntetiska fibrer (textil)



NÄRINGSLIVETS PRODUCENTANSVAR

*Hållbarhetsrapport 2025 - Svensk Plaståtervinning

Mixade polyolefiner

- Stor volym
  - Behöver minska
- Flexibel mixad polyolefin (F-MPO)
  - PE/PP eller kombination med PA eller PET
  - 90% multimaterial
- Styv mixad polyolefin (R-MPO)
  - 75% multimaterial
  - Svart plast
- Vanliga förpackningar är
  - Lång hållbarhet för aromatiska och feta produkter
  - Djupdragna förpackningar
  - Formstabila (stå-upp påse)





NÄRINGSLIVETS PRODUCENTANSVAR

Vad säger producenterna?

Nackdelar

- Tekniskt komplicerat
- Otakt med omgivning
- Brist på
  - Rätt data
  - Förståelse
- Förändringar över tid



Vad säger producenterna?

Fördelar

- Skapar tydlighet och transparens
  - DfR kommer in tidigt i projekt
  - Går att räkna på
- Lättare kommunikation, högre medvetenhet och motivation
  - Internt
  - Externt
- Utmanar sina förpackningslösningar



NÄRINGSLIVETS PRODUCENTANSVAR

Är det till nytta för PPWR-anpassning?

- Byggt upp förpackningsdata
- Medvetenhet om trafikljustabeller
  - Internt
  - Leverantörer
- Om grönklassad, bra förbered för kommande krav…
  - Limmade etiketter och tryck
  - Jämför med EN 18120



Tack!

NÄRINGSLIVETS
PRODUCENTANSVAR

Program

11.00 Faglig program

CEN-guidelines an PPWR recyclability rules: What's the next step
Vincent Colard, CITEO

PPWR: An update on recyclability and recycled content
Henrik Nilsson, Näringslivets Producentansvar (NPA)

Att sätta pris på återvinningsbarhet
Love Pallon, Näringslivets Producentansvar (NPA)

Trygge valg i usikre tider: No-Regrets Playbook for emballasje
Bård Bringsrud Svensen, Grønt Punkt Norge

12.30 Lunsj

14.00 Faglig program

Preparing for PPWR: The Role of Pack for the Future
Karen van de Stadt, Verpact

How RecyClass Supports PPWR Targets and High-Quality Recycling
Nadir Mekki, RecyClass

Design-for recycling – what does it mean?
Ulphard Thoden van Velzen, Wageningen University & Research

Harmonisering av plastemballasje
Johannes Daae, Grønt Punkt Norge

The future of plastic sorting
Lisa Höflechner, Tomra



Grønt Punkt Norge

Trygge valg i usikre tider

No-Regrets Playbook

for emballasjedesign

Bård Bringsrud Svensen
Fagansvarlig for materialer og teknologi

No-Regrets Playbook



PACKFORWARD

NÄRINGSLIVETS PRODUCENTANSVAR

CITEO

valipac

Fostplus

verpact

VALORLUX BE THE CHANGE

Grønt Punkt Norge

EMERGINGMOTIF

Hvordan ble eksemplene i dokumentet utarbeidet?

Vurderinger i bransjeprotokoller og standarder		
Stor enighet om gode designvalg	**Ingen enighet / diskusjoner pågår**	**Stor enighet om dårlige designvalg**
Designelementer godkjent i RecyClass, EN 18120 og COTREP	Alle andre relevante designelementer	Designelementer som **ikke** er godkjent i RecyClass, EN 18120 og COTREP







Slik er dokumentet oppbygd

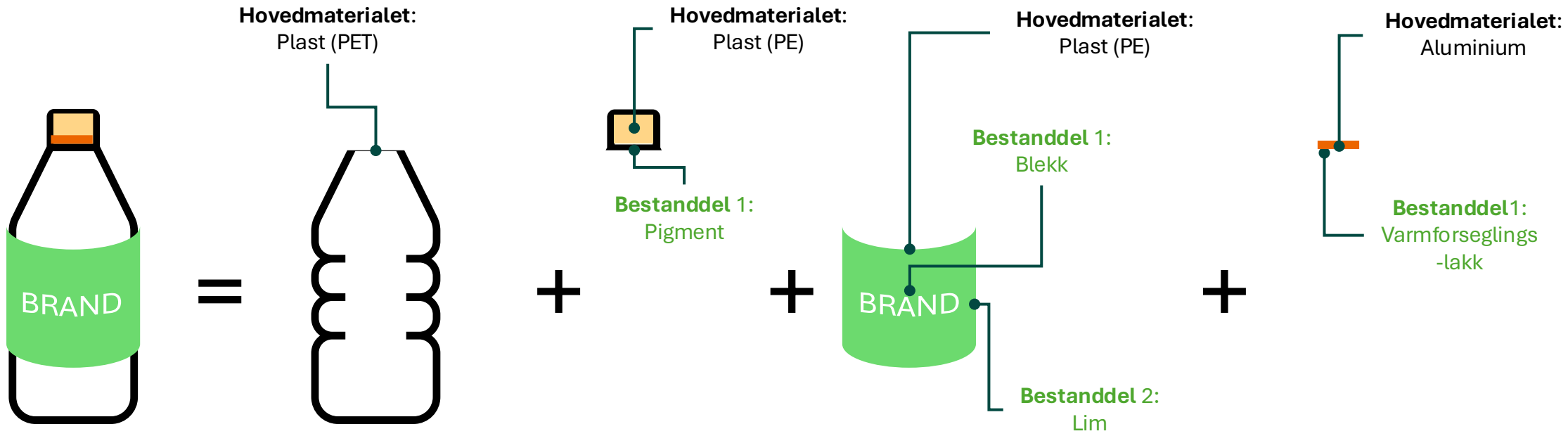
Forstå hva design for gjenvinning betyr, hvordan det sannsynligvis vil bli vurdert i EU, og hvilke fremtidige krav som vil komme under PPWR.

Vurder de sentrale designprinsippene å være forberedt på de kommende kravene til design for gjenvinning i PPWR.

Hent inspirasjon fra «beste praksis»-eksempler og fra utfordrende emballasjeløsninger



Logikk for vurdering av design for gjenvinning, basert på PPWR og CEN-standardene



Emballasjen

Hoveddel av emballasjen
Flaske i transparent PET

Integrert komponent 1:
Kork (HDPE)

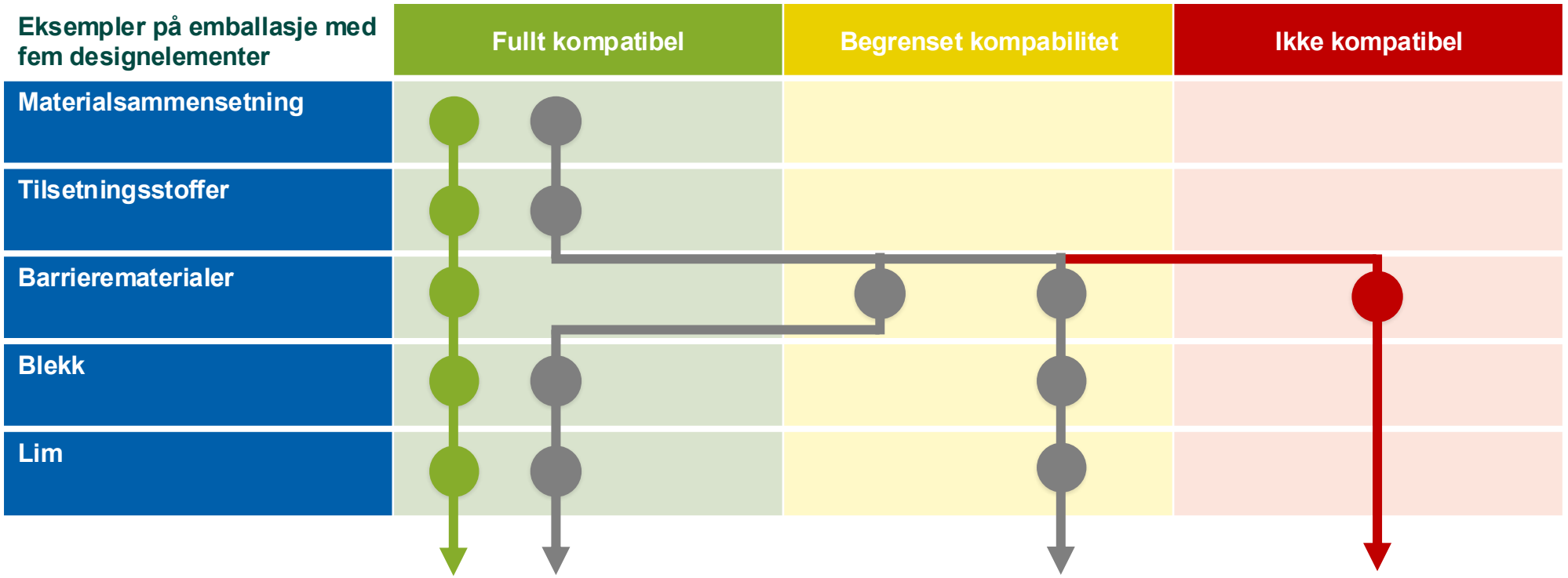
Integrert komponent 2:
Etikett (fleksibel PE)

Separat komponent 1:
Oblat (aluminium)

Anvend kriteriene som er definert for hoveddelen (PET-flasker, transparente/klar)

Separat komponent vurderes etter kriteriene for aluminiumsemballasje

En tydelig forventning om hvordan gule og røde designelementer påvirker gjenvinnbarheten



Karakter A bør være oppnåelig (forutsatt at det ikke oppstår vesentlige materialtap)

Utfallet avhenger av hvordan poengsummen beregnes; karakter A fremstår ikke som sannsynlig for alle disse tilfellene.

«Ikke gjenvinnbar» er et sannsynlig utfall, og emballasjen kan bli omfattet av et fremtidig markedsforbud.

Gode designprinsipper 

«Mono»-tilnærming er ikke alltid å foretrekke

Hvis en emballasjeenhet inneholder integrerte komponenter, kan disse være laget av andre materialer enn hoveddelen.

Avhengig av materialvalg kan integrerte komponenter støtte, påvirke eller til og med hindre gjenvinningen av hele emballasjeenheten.



Vær oppmerksom på designvalg som kan påvirke sortering

Enkelte designvalg, som heldekkende sleeves (etiketter som dekker hele emballasjen), kan påvirke NIR-sorteringen dersom de er laget av et annet materiale enn hoveddelen av emballasjen.



Bruk farge kun der det er nødvendig og unngå gjennomfarging om mulig

Der det er mulig, bør man unngå gjennomfarging av plast i emballasje, og heller beholde materialets naturlige farge eller kun bruke et hvitt pigment. Det bør foretrekkes å tilføre farge gjennom kompatible etiketter og sleeves.

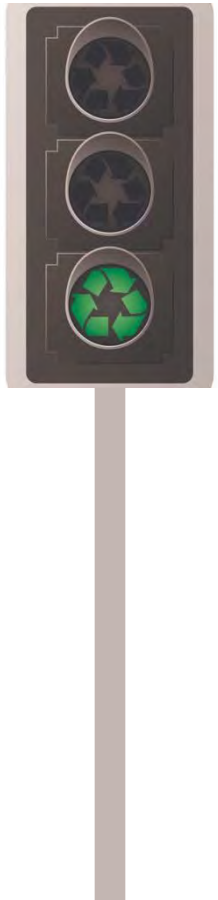


Minimer bruken av bestanddeler som trykkfarger, belegg, barrierer og lim

Ved å redusere mengden trykkfarger, belegg, barrierer, lim og andre bestanddeler til det som kun er nødvendig for emballasjens bruksområde, kan sannsynligheten for å oppnå en høy gjenvinnbarhetsscore i henhold til PPWR ytterligere forbedres.



Gode eksempler



Examples

Fleksibel PE-pose

Tradisjonelt har poser for vaskemidler og husholdningsprodukter blitt produsert som PET/PE-laminater. Med nyere utviklede «orienterte» PE-filmer, er det mulig å slike laminat med PE-filmer.

Vurderinger i bransjeprotokoller og CEN standardene		
Stor enighet om gode designvalg	**Ingen enighet / diskusjoner pågår**	**Stor enighet om dårlige designvalg**
• Alle filmer er laget av PE • < 3 vekt% PU-/akryllim • < 5 vekt% PU-blekk	• Nitrocellulose-blekk • Større mengder lim og trykkfarger	• PET/PE-foliekombinasjoner



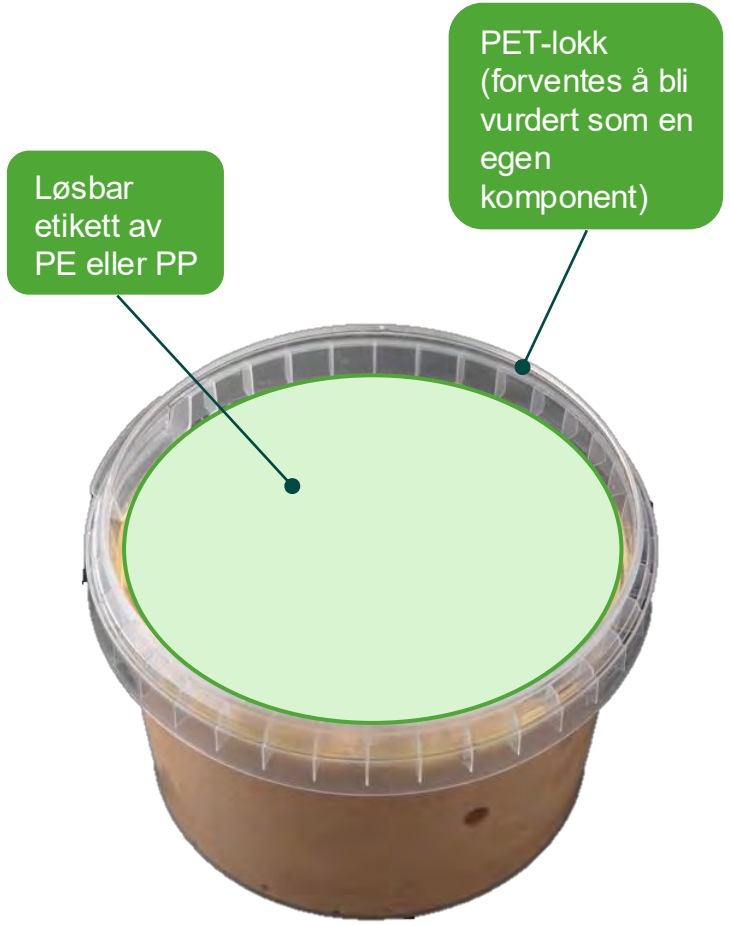
Examples

Transparent PET-emballasje med løsbar etikett

Transparent PET-emballasje har god gjenvinnbarhet.

Der et avtagbart lokk er tilstrekkelig, er dette å foretrekke, siden bruk av forseglingslag/-oblat, som kan påvirke gjenvinningen, unngås helt.

Ved å unngå direktetrykk og i stedet bruke en avtakbar etikett av PE eller PP bevares kvaliteten og fargen på den resirkulerte PET-en.



Vurderinger i bransjeprotokoller og CEN standardene		
Stor enighet om gode designvalg	**Ingen enighet / diskusjoner pågår**	**Stor enighet om dårlige designvalg**
• PET mono materiale i beger og lokk • Løsbar PE or PP etikett	• PET/PE-laminert eller ko-ekstrudert materiale for beger og lokk • Papiretiketter	

Examples

Flexible PE cheese packaging

Packaging for dairy products such as (grated) cheese requires barrier functionality.

Traditionally, a range of different barrier materials have been used for flexible packaging. Design for recycling guidance agrees on a specific set of barrier materials as good design choices and agrees on certain barrier materials as bad design choices. However, there is no consensus yet on some barrier materials. Further discussion and testing of these materials is expected.

Where possible, by using one of the barrier materials with good agreement, chances for a high recyclability score can already be optimised.

Situation in industry guidelines and CEN draft standards

Solid agreement on good design choices	No full consensus / still under discussion	Solid agreement on bad design choices
• All films made from PE • EVOH* up to 5wt%, AlOx, SiOx as barrier • < 3 wt% PU / acrylic adhesive • < 5 wt% of PU ink	• Metallised PE • Nitrocellulose inks • Larger amounts of EVOH • PA barriers • Larger amounts of adhesives and inks	• PET / PE film combinations • Aluminium foil barrier

*) constituted, with a suitable compatibilising tie layer



PE sauce bottle with EVOH barrier

PE exhibits lower intrinsic barrier properties, e.g., against oxygen ingress or aroma loss, than for example PET. If a barrier is required, PE packaging needs to be modified with additional components or constituents that provide the barrier.

The use of certain amounts of EVOH, as in this example, has been agreed to be fully compatible with the recycling of PE rigid packaging.

By using a releasable PE label, the option is given to the recycler to separate the coloured label material from the main body of the packaging.

Such a sauce bottle could also be designed in PP with similar principles; however, a different level of agreement exists for the barrier material.

Situation in industry guidelines and CEN draft standards

Solid agreement on good design choices	No full consensus / still under discussion	Solid agreement on bad design choices
• Bottle and closure made from PE • EVOH* as barrier (< 6 wt%) • Releasable PE labels	• Non-releasable labels • Releasable PP labels • Paper labels • Lighter metal closures / closure parts	• Heavier metal closures

*) crosslinked, with a suitable compatibilising tie layer



PP trigger spray bottle

Certain rigid packaging applications require special integrated components to facilitate their application.

For example, cleaning products often require to be sprayed directly from the packaging. In these cases, a trigger head is typically added to the packaging as an integrated component.

By choosing the same material for such integrated components as for the main body of the packaging, design for recycling can be optimised.

Further optimisation can be achieved by refraining from mass colouration of the bottle and the trigger head and using minimal print and compatible labels.

Situation in industry guidelines and CEN draft standards

Solid agreement on good design choices	No full consensus / still under discussion	Solid agreement on bad design choices
• Bottle and closure made from PP • Releasable PP label • Metal-free trigger systems	• Limited amounts of metal in triggers • Non-releasable labels	• Larger amounts of metal in triggers



Flexible PP pet food packaging

Traditionally, wet pet food stand-up have been produced as PET/Al/CPP laminates.

More recently, the option has been opened to use all-PP designs for this application, replacing PET film and aluminium foil with BOPP film and barriers such as AlOx or SiOx, respectively.

Situation in industry guidelines and CEN draft standards

Solid agreement on good design choices	No full consensus / still under discussion	Solid agreement on bad design choices
• All films made from PP • AlOx, SiOx as barrier layers • < 3 wt% PU / acrylic adhesives • < 5 wt% of PU inks	• Metallised PP • Nitrocellulose ink • Larger amounts of adhesives and inks • EVOH, PA barriers	• PET / PP film combinations • Aluminium foil barrier



Flexible PP snack packaging

Snack packaging based on PP films is widespread and has traditionally been made with either a single or two layers of PP film.

Recyclability can be optimised by choosing a recycling-compatible adhesives and inks as well as barrier materials, where needed.

Limiting the amount of adhesive and print optimises the compatibility.

Situation in industry guidelines and CEN draft standards

Solid agreement on good design choices	No full consensus / still under discussion	Solid agreement on bad design choices
• All films made from PP • AlOx, SiOx as barrier layers • < 3 wt% PU / acrylic adhesives • < 5 wt% of PU inks	• Metallised PP • Nitrocellulose ink • Larger amounts of adhesives and inks • EVOH, PA barriers	• PET / PP film combinations • Aluminium foil barrier



PET ketchup bottle with a sealing disc

The use of transparent and natural-colour PET and the use of a releasable PE or PP label leads to optimal PET recyclate quality.

The use of a floating cap material allows for easy separation of the cap material from the PET of the main body and for subsequent separate recycling of the cap material.

Where possible, the use of a seal that is recyclable should be considered. (The seal is expected to be considered a separate component and therefore assessed separately to the bottle)

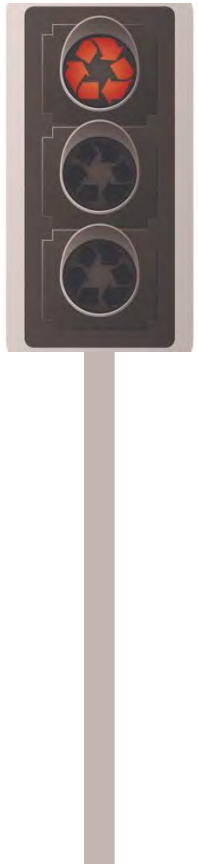
NOTE: A multi-material sealing disc, which includes aluminium foil, may be needed to provide necessary barrier properties for this packaging. If the seal is considered a separate component, it is not expected to not disturb the recycling of the bottle (or the cap). It is expected that the impact on the PPWR recyclability performance grade of such seals will be small as long as their weight share in the overall packaging is sufficiently low

Situation in industry guidelines and CEN draft standards

Solid agreement on good design choices	No full consensus / still under discussion	Solid agreement on bad design choices
• Transparent PET for the bottle body • Releasable PE or PP label • PE or PP rigid closures (density < 1 kg/dm³)	• Paper labels	• Metal closures • Non-releasable labels



Uheldig designvalg



Examples

Unngå synlig metallisering

Sortering påvirkes/hindres av store områder synlig metallisering.

Bruk av ugjennomsiktige filmer, eller trykk som dekker en tilstrekkelig stor del av overflaten.

Vurderinger i bransjeprotokoller og CEN standardene	
Stor enighet om dårlige designvalg	Alternatives
La store deler av overflaten være eksponert ved bruk av metalliserte filmer.	Dekk til metalliseringen med en ugjennomsiktig folie eller trykk, eller velg et alternativt barrierematerialeе.



Examples

Unngå papiretiketter og dokumentlommer på strekkfilm og krympehetter

Papir har en betydelig negativ påvirkning på gjenvinningen av PE- og PP-folie.

Dersom etiketten må være vannbestandig, kan en velge etikett av samme materiale som folien, for eksempel PE.

Vurderinger i bransjeprotokoller og CEN standardene	
Stor enighet om dårlige designvalg	Alternatives
Papiretiketter, særlig de som ikke løsner i vann	PE-etiketter med lim som løsner i vann



Examples

Grønt Punkt Norge

Usikkerhet er ingen grunn til å stå stille...

Begynn med valgene det allerede er bred enighet om!

FORBEREDELSE

1. Kartlegg hoveddel, komponenter og bestanddeler
2. Be om presis materialdata
3. Sikre gode systemer for lagring av dataen

VURDERINGER

1. Bli kjent med innholdet i *No-Regrets*, GPN Gjenvinningskalkulator og de nye CEN standardene (NS-EN 18120)
2. Fjern røde risikoelementer
3. Prioriter løsninger med bred enighet

Avslutningsvis en viktig merknad:
Playbooken er ikke en juridisk fasit, men en konsensusbasert veileder.

Grønt Punkt Norge

Usikkerhet er ingen grunn
til å stå stille...

Begynn med valgene
det allerede er bred
enighet om!

No-Regrets Playbook

Lastes ned her:

Grønt Punkt Norge



NÆRINGSLIVETS PRODUCENTANSVAR



Program

11.00 Faglig program

CEN-guidelines an PPWR recyclability rules: What's the next step
Vincent Colard, CITEO

PPWR: An update on recyclability and recycled content
Henrik Nilsson, Näringslivets Producentansvar (NPA)

Att sätta pris på återvinningsbarhet
Love Pallon, Näringslivets Producentansvar (NPA)

Trygge valg i usikre tider: No-Regrets Playbook for emballasje
Bård Bringsrud Svensen, Grønt Punkt Norge

12.30 Lunsj

14.00 Faglig program

Preparing for PPWR: The Role of Pack for the Future
Karen van de Stadt, Verpact

How RecyClass Supports PPWR Targets and High-Quality Recycling
Nadir Mekki, RecyClass

Design-for recycling – what does it mean?
Ulphard Thoden van Velzen, Wageningen University & Research

Harmonisering av plastemballasje
Johannes Daae, Grønt Punkt Norge

The future of plastic sorting
Lisa Höflechner, Tomra

Program

11.00 Faglig program

CEN-guidelines an PPWR recyclability rules: What's the next step
Vincent Colard, CITEO

PPWR: An update on recyclability and recycled content
Henrik Nilsson, Näringslivets Producentansvar (NPA)

Att sätta pris på återvinningsbarhet
Love Pallon, Näringslivets Producentansvar (NPA)

Trygge valg i usikre tider: No-Regrets Playbook for emballasje
Bård Bringsrud Svensen, Grønt Punkt Norge

12.30 Lunsj

14.00 Faglig program

Preparing for PPWR: The Role of Pack for the Future
Karen van de Stadt, Verpact

How RecyClass Supports PPWR Targets and High-Quality Recycling
Nadir Mekki, RecyClass

Design-for recycling – what does it mean?
Ulphard Thoden van Velzen, Wageningen University & Research

Harmonisering av plastemballasje
Johannes Daae, Grønt Punkt Norge

The future of plastic sorting
Lisa Höflechner, Tomra

Pack for the Future

From Packaging Challenges to Circular Solutions



20 October 2026 www.verpact.nl

verpact

Karen van de Stadt

Strategic expert packaging Verpact



20 October 2026

Agenda

01 Introduction Verpact

02 Pack for the Future

04 Challenges

05 What can you do today?







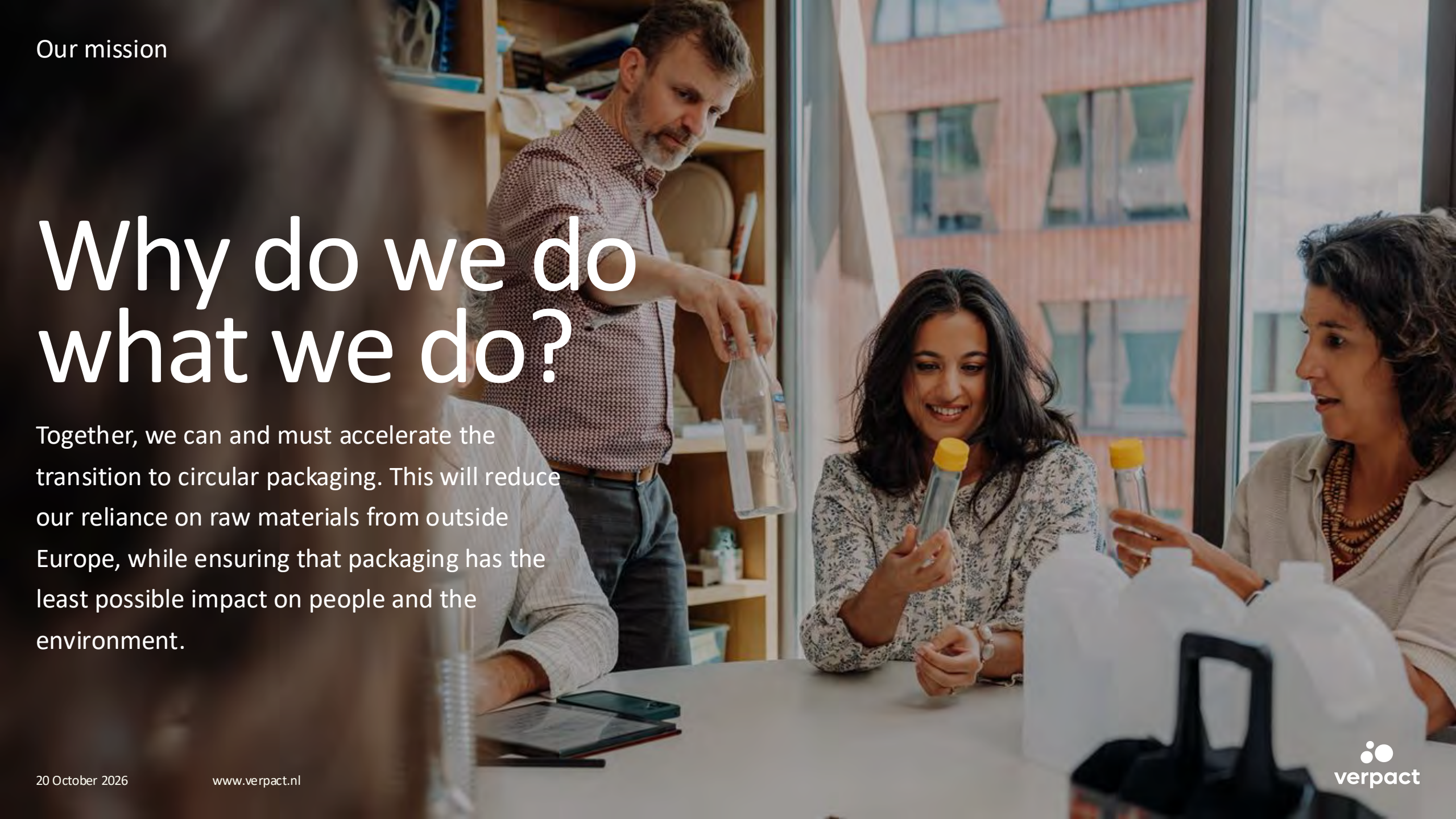
This is Verpact





Why do we do what we do?

Together, we can and must accelerate the transition to circular packaging. This will reduce our reliance on raw materials from outside Europe, while ensuring that packaging has the least possible impact on people and the environment.



verpact

Verpact takes care of it all

On behalf of packaging manufacturers and importers, Verpact implements Extended Producer Responsibility (EPR) for packaging.



We represent manufacturers and importers



We invest in knowledge and actively share it



We enter into agreements with 342 local authorities



We enter into contracts with sorters and recyclers



We implement European regulations on single-use plastics



We are committed to preventing litter



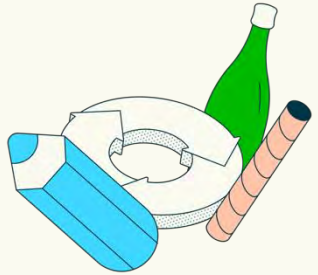
We organise the deposit-return scheme for plastic beverage bottles and cans



We report to the government

verpact

How we are accelerating a fully circular packaging chain



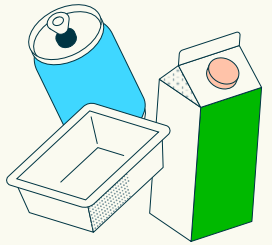
Promoting
design for recycling reduce



Rewarding
the use of recyclates in packaging with a reduced fee



Driving
change in the plastics market with the Delta Plan for Circular Plastic Packaging



Encouraging
consumers to sort packaging better after use

The packaging transition is already underway

Challenges companies face

- From 2030, packaging will need to comply with the European Design for Recycling requirements.
- Recycled-content requirements increase the need for high-quality recycling.
- Companies need practical solutions before all regulatory details are final.
- Packaging design decisions made today determine future compliance.



verpact



Why Pack for the Future?

Bridging the gap

- Many packaging formats still face sorting or recycling challenges.
- Producers and retailers need more than regulatory information.
- They need direct access to suppliers, recyclers, experts and tested solutions.
- Pack for the Future connects a regulatory challenge with practical innovation.

verpact

Unique collaboration

Belgium and the Netherlands supported by objective validation



Initiative by Fost Plus

Members of Fost Plus asked for practical solutions for non-recyclable packaging. Fost Plus turned this challenge into **Pack for the Future** and asked Verpact to join.



Validation by Wageningen University & Research

To ensure objective evaluation of the proposed challenges we asked experts at Wageningen University & Research (WUR) to evaluate and valited the proposed solutions

Collaboration with Norway and Sweden,
to help even more companies in other markets

verpact

The outcome

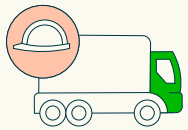
A marketplace for knowledge, solutions and collaboration



Regulation

What regulation do you have to comply with?

→ Understanding the principles of the PPWR



Solutions

Which alternatives are available and scalable today?

→ Validated solutions present in a markted place – meet the suppliers



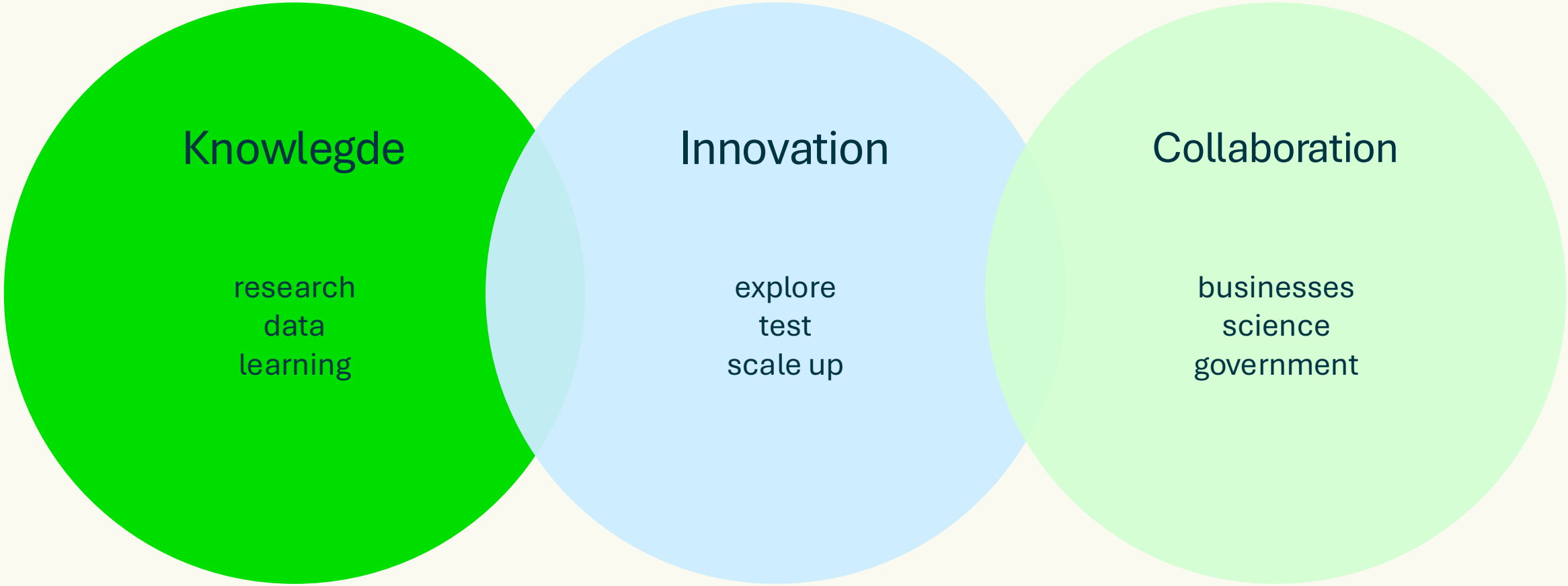
Collaboration

What makes packaging recyclable in practice?

→ Experts, brand owners, retailers, sorters, recyclers, and suppliers come together to address a specific problem and take next steps!

Nobody has the roadmap to 2030

Knowledge, innovation and collaboration are key



Pack for the Future's goal is to connect insights and parties to enable choices in the value chain.


CHASSÉ | THEATER
P
A
We Will Rock You
CHASSÉ | CINEMA

22 challenges rooted in real packaging barriers

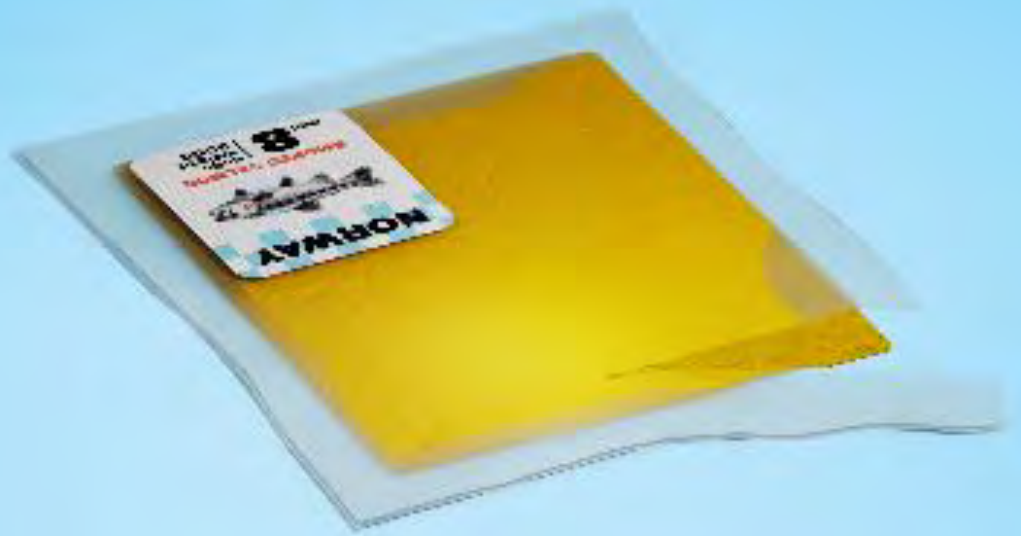
Real packaging → Identified barrier → Challenge description → Offers from suppliers → Validated solutions







verpact



Testimonal

Albert Heijn & Mowi

Salmon Packaging

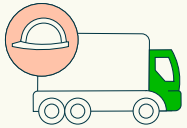
Pack for the Future 2026

Who were there?



Vistors

Action, Albert Heijn, ALDI, Arla Foods, Barry Callebaut, Bidfood, Biscuit International, Bonduelle, Carrefour, Cérélia, Cloetta, Colruyt Group, Danone Nutricia Research, Delhaize, Ferrero, FrieslandCampina, Harvest House, HEMA, IKEA, Jacobs Douwe Egberts Peets, Jumbo, Lidl, McBride, Menken Orlando, Mondelez International, Neuteboom, Next Lemon, Pepsico , Perfetti van Melle, Plus, Rijk Zwaan, Royal FloraHolland, Royal Merba, Royal Smilde, SCJohnson, Sigma, Signature Foods, Sligro Food Group, Snack Connection, Superunie, Unilever, Vandemoortele, Vepo Cheese, Vergeer Holland, Verstegen Spices & Sauces, Vezet



Suppliers

Amcor Flexibles, Adpapa, CCL Label, Constantia Flexibles, Corplex, Euralpack, Faerch, Gen grinders, Global Flexibles, MCC Global, Mondi, Multi Papier Sustainable Packaging, New Packaging Group, OPACKGROUP, Packas, Packyard, Quib packaging, Rottneros, Segers & Balcaen, Südpack Verpackungen, Trioworld, Wipak Group





verpact

What can you do today?

Keep calm and carry on!

The companies that will be best prepared for PPWR are not necessarily those with the best regulatory knowledge, but those that start learning, testing and collaborating today

1. **Start now, not when all guidance is available**
2. **Prioritize your biggest packaging challenges**
3. **Work together across the value chain**
4. **Implement no-regret design changes today**
5. **Treat PPWR as an innovation opportunity**

verpact



Pack for the Future shows that regulation can create urgency and direction, but collaboration turns that urgency into practical change.

Identify the challenge. Connect the value chain. Test the solution. Scale what works.

verpact

Thank you for your attention!

kvandestadt@verpact.nl

Program

11.00 Faglig program

CEN-guidelines an PPWR recyclability rules: What's the next step
Vincent Colard, CITEO

PPWR: An update on recyclability and recycled content
Henrik Nilsson, Näringslivets Producentansvar (NPA)

Att sätta pris på återvinningsbarhet
Love Pallon, Näringslivets Producentansvar (NPA)

Trygge valg i usikre tider: No-Regrets Playbook for emballasje
Bård Bringsrud Svensen, Grønt Punkt Norge

12.30 Lunsj

14.00 Faglig program

Preparing for PPWR: The Role of Pack for the Future
Karen van de Stadt, Verpact

How RecyClass Supports PPWR Targets and High-Quality Recycling
Nadir Mekki, RecyClass

Design-for recycling – what does it mean?
Ulphard Thoden van Velzen, Wageningen University & Research

Harmonisering av plastemballasje
Johannes Daae, Grønt Punkt Norge

The future of plastic sorting
Lisa Höflechner, Tomra

HOW RECYCLASS SUPPORTS PPWR TARGETS AND HIGH-QUALITY RECYCLING

RecyClass

PACK FOR FUTURE, OSLO

October 21st, 2026

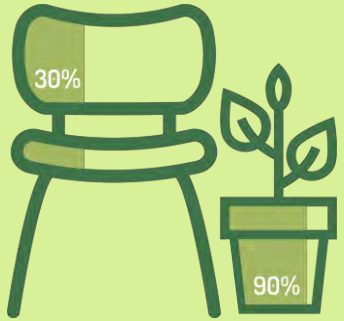
1.

RECYCLASS INTRODUCTION

DEVELOPING & HARMONISING RECYCLABILITY PRINCIPLES



DRIVING TRANSPARENT USE OF RECYCLED PLASTIC



Value Chain Collaboration

BRANDS & RETAILERS



RAW MATERIAL PRODUCERS



CONVERTERS



TECHNOLOGY PROVIDERS



Supporters


The Association of Plastic Recyclers
ÇEVKO
CORPET BOTTLE TO BOTTLE
GRA
eumeps
FEPRA
GLOBAL SELF-CARE FEDERATION
RETURPACK
FINAT
Fostplus
LÉKO
LINPRA
Styrenics Circular Solutions
natureef
POLSKI PAKT PLASTIKOWY
VANA
Searious BUSINESS
Svensk Plaståtervinning
STINA
INFINITUM
syba
TMR
HPRC
AGMPM
epro
ANARPLA
EuPIA
petcore EUROPE
FEICA
Grønt Punkt Norge
ČESKÁ TECHNOLOGICKÁ PLATFORMA PLASTY
NTCP national test centre circular plastics
Landbell Group
NÄRINGSLIVETS PRODUCENTANSVAR
recovinyl
plarebel
PACKUK
OPRL
ponto verde
verpact
febelauto
MedPharmPlast
EFIBCA

RecyClass EPRs and DRS Supporters



2.

SUPPORTING PPWR TARGETS THROUGH RECYCLASS METHODOLOGY

Recyclability in the EU legislation

Packaging & Packaging Waste Regulation

By 2030
All packaging units must be 'designed for material recycling'

	A	B	C	Not recyclable
Assessment of recyclability per unit, in weight	95%	80%	70%	<70%
Comments	**Can** be placed on the market			**Cannot** be placed on the market

By 2035
Separately collected, sorted into specific streams and recycled at scale

By 2038

	A	B	C	Not recyclable
Assessment of recyclability per unit, in weight	95%	80%	70%	<70%
Comments	**Can** be placed on the market		Not recycled at scale – **cannot** be placed on the market	

Recycled Content in the EU legislation

Packaging & Packaging Waste Regulation

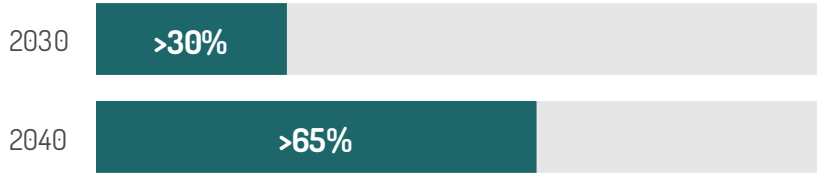
PET contact sensitive packaging



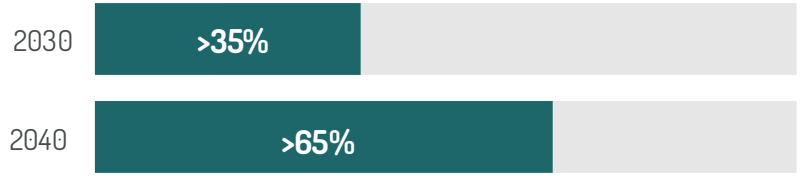
Contact sensitive plastic packaging



Single use plastic beverage bottles



Other plastic packaging





WHAT DO THESE TARGETS IMPLY?

RecyClass

- State of the art **sorting & recycling** efficiency of today are good, but **are they enough to reach the targets ahead?**
- **Design for recycling will be the determining factor** for reaching the PPWR targets
- **Incompatible materials cause** sorting & recycling issues, leading to the **loss of valuable material**
- Designing for recycling today, secures circular feedstock of tomorrow



What makes a product recyclable?

The product must be **made with plastic that is collected** for recycling, has market value and/or is supported by a legislatively mandated program.

The product must be **sorted & aggregated into defined streams** for recycling processes.

The product **can be processed & reclaimed/ recycled** with commercial recycling processes.

The recycled plastic becomes a raw material that is **used in the production of new products.**

RecyClass Methodology

$$Ete_i = \left(\frac{Pe - W}{Pf}\right) x\ 100$$

More than 5% = Sorting test mandatory

4. Easy-to-Empty / Easy-to-Access Index

3. Design incompatibilities (DfR Guidelines)

Full compatible elements	No class penalty
Limited compatible elements	-1 Class (class penalties not cumulative)
Non compatible elements	Disqualification

Preliminary recyclability class is assigned

Class A	Class B	Class C	Not recyclable
if > 95%	if 95-80%	if 80-70%	< 70%

2. Recyclable Plastic Content

1. Existing recycling streams & Sortability



Class A

Packaging poses no recyclability issues & the recycled plastic can potentially feed a closed-loop scheme.

Class B

The packaging has some minor recyclability issues that slightly affect the quality of the recycled plastic generated. However, majority of recycled plastics from this packaging can still potentially feed a closed loop.

Class C

The packaging presents some recyclability issues that affect the quality of the recycled plastics or lead to material losses during recycling. In the first case the recycled plastic could be used in a cascade open-loop scheme, whereas in the latter case the plastic could potentially feed a closed loop scheme.

Recyclability in Practice: Good vs Bad Design



COMPOSITION
- HDPE Tube: 83 wt. %
- PP closure: 11 wt. % of PP

ADDITIONAL INFORMATION
- Colour masterbatch: 1 wt. %
- Direct printing: 1 wt. %
- Barrier: EVOH 4 wt. % with PE g-MAH tie layers.
- The packaging is well sorted in the HDPE coloured stream.

RecyClass C RECYCLABILITY

→

COMPOSITION
- HDPE Tube: 84 wt. %
- PP closure: 11 wt. % of PP

ADDITIONAL INFORMATION
- Colour masterbatch: 1 wt. %
- Direct printing: 1 wt. %
- Barrier: **EVOH 3 wt. %** with PE g-MAH tie layers.
- The packaging is well sorted in the HDPE coloured stream.

RecyClass B RECYCLABILITY

→

COMPOSITION
- HDPE Tube with PE closure: 95.5 wt. %

ADDITIONAL INFORMATION
- Colour masterbatch: 1 wt. %
- Direct printing: **0.5 wt. %**
- Barrier**: EVOH 3 wt. %** with PE g-MAH tie layers.
- The packaging is well sorted in the HDPE coloured stream.

RecyClass A RECYCLABILITY

Step 1. Recyclable plastic content:
100 – 6 = 94 % → ***Interim class B***.
Note: PP is considered as recyclable plastic content.

Step 2. DFR Incompatibilities:
- PP closure representing more than 10 % of the total weight of the packaging → 1 class deduction.
- EVOH ≤ 6 % with PE g-MAH tie layers → No class deduction.
- Direct printing ≤ 1 % → No class deduction

→ 1 class deduction.

Step 1. Recyclable plastic content:
100 – 5 = 95 % → ***Interim class A***.
Note: PP is considered as recyclable plastic content.

Step 2. DFR Incompatibilities:
- PP closure representing more than 10 % of the total weight of the packaging → 1 class deduction.
- EVOH ≤ 6 % with PE g-MAH tie layers → No class deduction.
- Direct printing ≤ 1 % → No class deduction

→ 1 class deduction.

Step 1. Recyclable plastic content:
100 – 4.5 = 95.5 % → ***Interim class A***.
Note: PP is considered as recyclable plastic content.

Step 2. DFR Incompatibilities:
- PE closure with **low MFI** → No class deduction.
- EVOH ≤ 6 % with PE g-MAH tie layers → No class deduction
- Direct printing ≤ 1 % → No class deduction

3.

PPWR COMPLIANCE

PPWR COMPLIANCE

Declaration of Conformity

- **August 2026**: Declaration of Conformity enters into force
- **FAQ on PPWR**: the EC updated it in August and included clarifications on the Declaration of Conformity

How can RecyClass support?

RecyClass self-assessment Online Tool

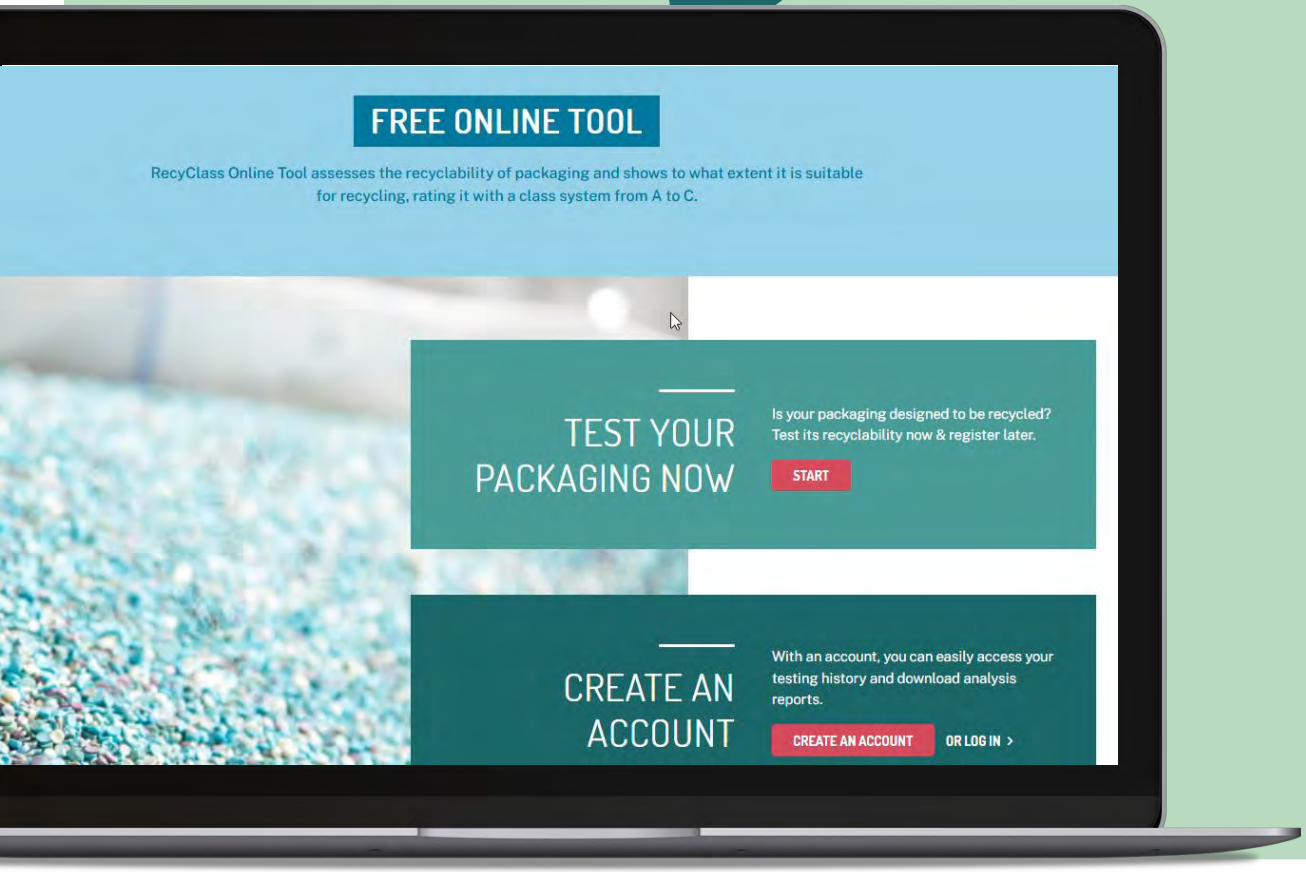
- ➔ Free of charge
- ➔ In line with RecyClass recyclability methodology & EN 13430
- ➔ Based on RecyClass Design for Recycling Guidelines

RecyClass Certification

- ➔ Third-party certification (Design for Recycling, Recyclability Certification)
- ➔ Widely recognised in the EU27+3 zone
- ➔ Allowing associated recyclability claims
- ➔ Certificates valid for 3 years

Robust technical input to the PPWR technical documentation

What is the RecyClass Online Tool?



Sign up today for the free-of-charge tool to assess packaging recyclability:

- **Unlimited** number of analyses
- Indications on how to **improve** the features of your packaging & **boost** its recyclability
- **Simulated results** for the certification of packaging recyclability
- **Information** on existing recycling streams in Europe
- **Constantly updated** information about country-specific collection & sorting infrastructures

RecyClass third-party Certifications

LETTER OF COMPATIBILITY*

**semi-finished packaging*

DESIGN FOR RECYCLING

RECYCLABILITY



- Based on RecyClass Methodology
- **Class ranking from A to C**
- Packaging design, sorting behaviour, end-markets included

- Valid for the **EU market**
- Based on the **European plastic waste streams**

- **Country-specific** (based on the **local collection and availability of infrastructures)**
- On-pack class ranking logo

SORTING PROCESS

RECYCLING PROCESS

RECYCLED PLASTICS TRACEABILITY







- **Based on EN 15343**
- **Segregation/controlled blending chain of custody model** (ISO 22095:2020)
- **Definitions of waste,** pre-consumer/post-consumer (ISO 14021)
- Procedures aligned with **conformity assessment** as described in ISO 17065.
- **Positive evaluation** (European co-operation for Accreditation) **in line with ISO 17065**
- **Can be done for a group of products**
- **% based on physical traceability**

- Aligned with **Regulation (EU) No 2022/1616** (**Module A** requirements)

4.

CONCLUSION

RecyClass

Join us

Let’s work together to make plastics circularity a reality

KEY TAKEAWAYS

- RecyClass provides a harmonised, science-based recyclability framework for Europe, covering packaging, automotive and EEE plastics
- Design for Recycling Guidelines and Testing Protocols work together: lab-scale testing feeds directly into guidelines, which are the basis of the recyclability certification scheme
- Clear compatibility categories help industry make informed material and design decisions based on real recycling performance
- RecyClass supports regulatory preparedness, helping companies substantiate recyclability and recycled-content claims under evolving EU legislation

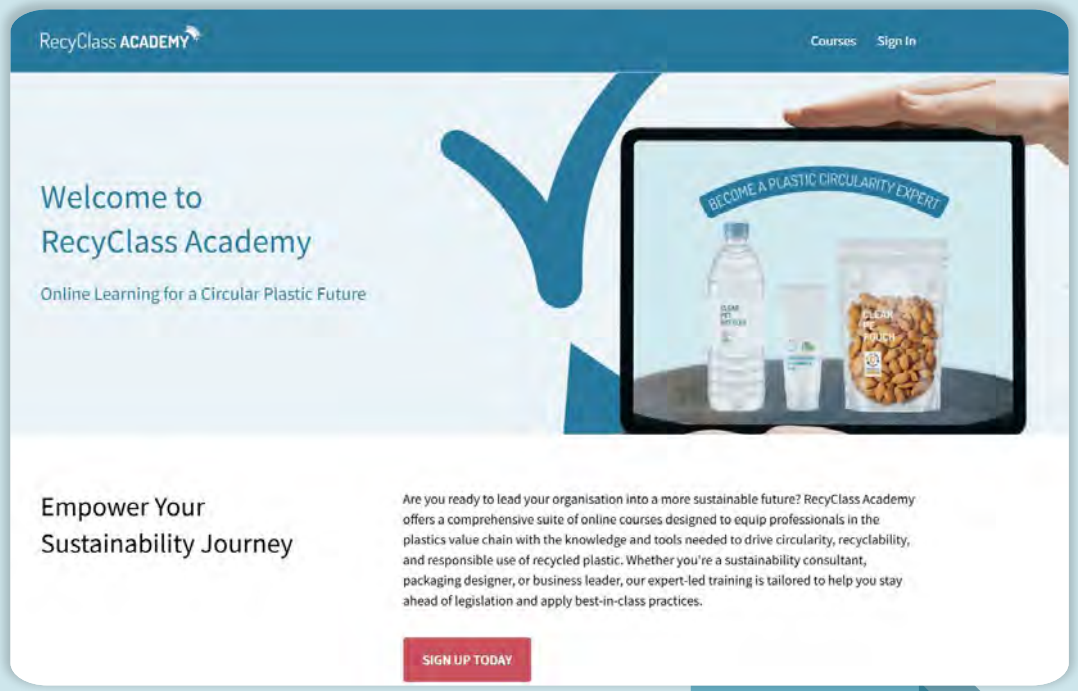
RecyClass Academy

Learn the basics of plastics circularity with RecyClass!

Circularity in Practice: Introduction to Plastic Recyclability & Use of Recycled Plastic

SIGN UP TODAY

Members are offered a 10% discount.



RecyClass

Avenue de Broqueville, 12
1150 Brussels - Belgium

+32 2 786 39 08

info@recyclass.eu

www.recyclass.eu



Program

11.00 Faglig program

CEN-guidelines an PPWR recyclability rules: What's the next step
Vincent Colard, CITEO

PPWR: An update on recyclability and recycled content
Henrik Nilsson, Näringslivets Producentansvar (NPA)

Att sätta pris på återvinningsbarhet
Love Pallon, Näringslivets Producentansvar (NPA)

Trygge valg i usikre tider: No-Regrets Playbook for emballasje
Bård Bringsrud Svensen, Grønt Punkt Norge

12.30 Lunsj

14.00 Faglig program

Preparing for PPWR: The Role of Pack for the Future
Karen van de Stadt, Verpact

How RecyClass Supports PPWR Targets and High-Quality Recycling
Nadir Mekki, RecyClass

Design-for recycling – what does it mean?
Ulphard Thoden van Velzen, Wageningen University & Research

Harmonisering av plastemballasje
Johannes Daae, Grønt Punkt Norge

The future of plastic sorting
Lisa Höflechner, Tomra

Recyclable solutions for everyday Packaging

PACK FOR THE FUTURE



Packaging Fair
21 October 2026

Carls AS
Trondheimsveien 113 Oslo

Grønt Punkt Norge · verpact · WAGENINGEN UNIVERSITY & RESEARCH · Fostplus · NÄRINGSLIVETS PRODUCENTANSVAR

Design-for-recycling, Relevance and evolution

Ulphard Thoden van Velzen

Grønt Punkt Norge verpact WAGENINGEN UNIVERSITY & RESEARCH Fostplus NÄRINGSLIVETS PRODUCENTANSVAR

Why is recyclability important?

- Only with well-recyclable packages we can:
  - Reduce our climate impact
  - Reduce the leakage of plastics into nature
  - Become less dependant of import of fossil feedstocks
  - Become less dependant on foreign regimes

- However, many packages are not-well recyclable
  - Cannot be sorted adequately, or
  - Reduce the quality of the recycled plastic



Recyclability

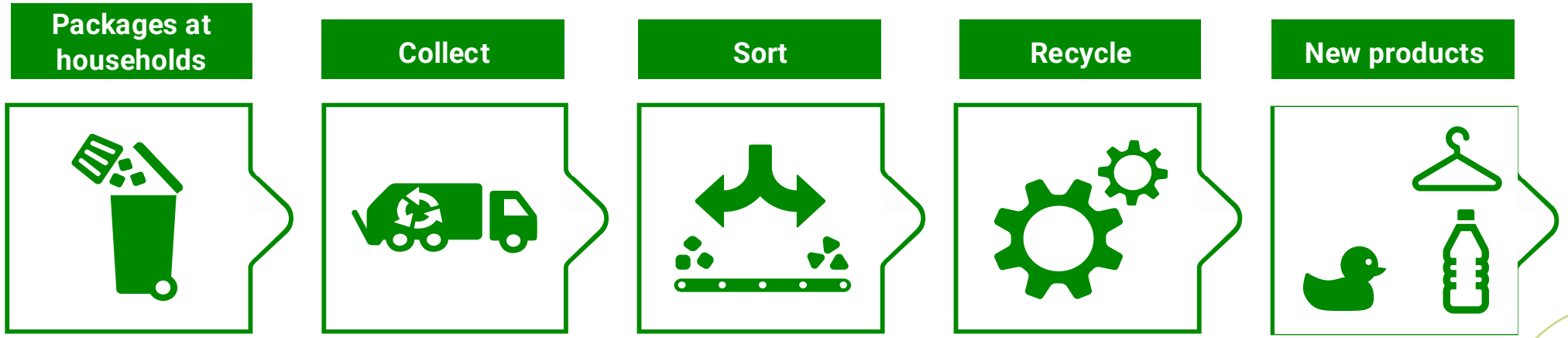
- The ability to be recycled (of plastic packages)

- Its practical meaning depends on:
  - The objectives of the recycling system - the goal
  - The infrastructure that is in-place - the means

- Consequently, its practical meaning
  - has varied between countries, but is converging within the EU
  - and will change in time due to
    - new infrastructure
    - new political objectives
    - new scientifical insights

Early principles of recyclability (PRE 2021)

1. Plastic packages are collected for recycling
2. Plastic packages are sorted into sorted products which are traded to recycling companies
3. Sorted products are recycled
4. The recycled plastic is used to make new products



The 2 most pressing pitfalls

- Packages cannot be sorted efficiently

- Packages contain other materials & substances of concern that reduce the quality of the recycled plastic

Typical sorting issues with plastic packages

- Small packages
- Large labels & sleeves that obscure the main material
- Non-targeted main materials
- Metallic components in the package
- Not or insufficiently emptied packages
- Black plastics











Typical recycling issues



- Incompatible materials that are inseparable
- Use of substances of concern
  - carbon black
- Use of precursors of substances of concern
  - inks, pigments, PUR-tie-layers













Today at Pack for the Future, we work to improve some of the most common issues

- The improvements shown are relevant and make direct impact







- These are first important steps in our shared journey towards more circularity

The PPWR will be the next step

Designed for recycling

2030 Market access exclusively for recyclable packages

2035 Packages must be recycled at scale

2038 Market access Exclusively for best Recyclable packages

Allowed materials

2026 PFAS limitation

2027 Further restrictions substances of concern

2030 Mandatory use of minimal shares of recycled content

Restrictions on the use of compostable materials

2040 Raised levels of shares of recycled content

Reuse & refill

Various targets for reusable packages

- E-commerce
- Take away
- Transport…

Waste reduction

Minimalization packages (weight, head space)

Reduction packaging waste per member state
2030: -5% i.r.t. 2018
2035: -10%
2040: -15%

Ban on packaging types
-Grouped
-Vegetables & fruit
< 1,5 kg
-Horeca

Harmonising legislation

Regulation

Declarations of conformity with exchangeable data

Align labelling for waste collection between member states

Recyclability in the PPWR

- The PPWR demands amongst other things that:
  - Member states reach recycling rates for plastic packages of:
    - 50% by 2025 & 55% by 2030
  - Producers will only bring recyclable packages on the market
    - In 2030 those that fulfil categories A, B or C
    - In 2038 only those that fulfil categories A or B
  - Producers will use recycled content in newly produced packages
- This requires clear rules on what is recyclable

Article 6 of the PPWR

- From 2030 on all packages must be designed-for-recycling
- The final EU definition will somehow be based on mass-shares of targeted material
  - A > 95% target material is encouraged
  - B > 80% target material is tolerated
  - C > 70% target material is discouraged and forbidden from 2038
  - D <70% target material is discouraged and forbidden from 2030
- Packages must be separately collected, sorted efficiently and recycled at scale in the whole EU
- Packages of medication, medical devices, infant formula, dangerous goods are excluded, as are innovative packages

Article 7: recycled content in plastic packages

	2030*	2040
Contact sensitive plastic packages		
All single-use plastic beverage bottles	30%	65%
All other PET-based packages	30%	50%
All other plastic packages that are no beverage bottles	10%	25%
Non-contact sensitive packages	35%	65%

* Exact moment will be decided by the EC

- Determined for each company per year
- Only post-consumer recycled plastic is allowed
- A few exceptions for medical packaging, dangerous goods, etc.

Recyclability: goals & means

Objectives

- 1: Plastic lumber
  - Almost all plastic packages will be recyclable
- 2: Food-grade recycling
  - Only PET bottles and PET trays are currently recyclable

Infrastructure

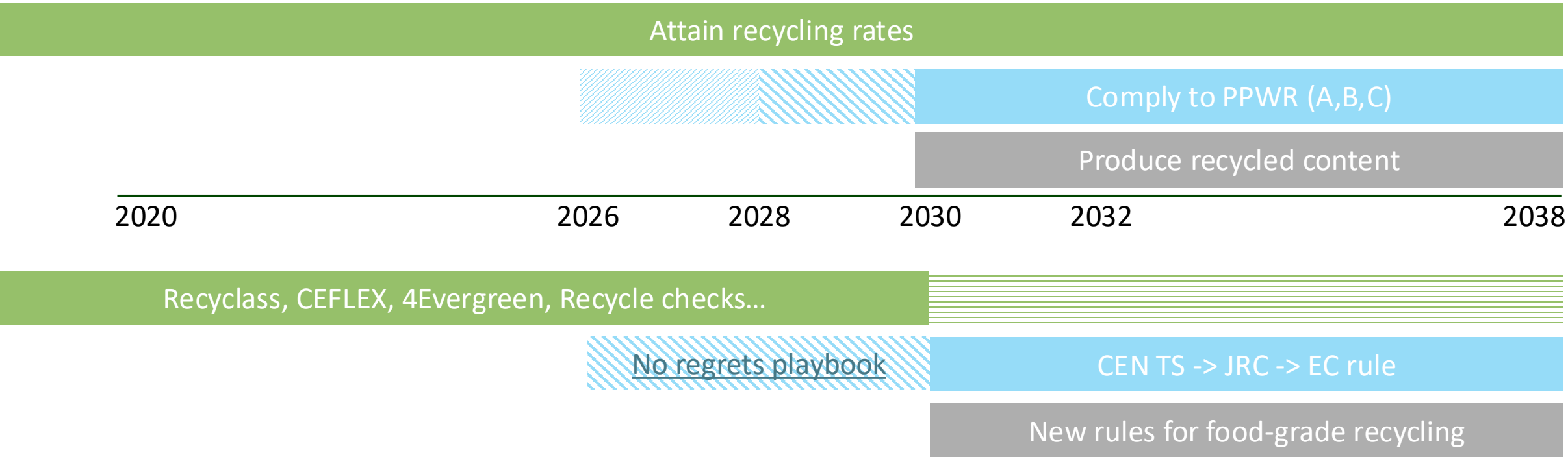
- 1 Mechanical recycling
  - Substances of concern should be absent
  - All non-targeted components should be removable
- 2 Pyrolysis
  - Preferably no PVC, PET, PA, printing inks…

Reflection on objectives

- Hitherto multiple stakeholders provided recycling guidelines
  - Recyclass –European recyclers (predominantly mechanical recyclers)
  - CEFLEX –Flexible packaging producers & FMCG industry
  - 4Evergreen –Paper industry
  - Recycling checks (NL) –EPR organisation …
  - CEN 18020 technical specifications

- With the PPWR we get a new objective: the production of recycled content and we will have to redefine from guidelines to rules
- Moreover, we must redefine them again to make the production of food grade recycled polyolefins feasible

New objectives results in new D4R guidelines



Perspective in time

- Today we can improve our recycling system by addressing the challenges in the Pack for the Future convention
- We can also continue to improve the designs of all our packages with the existing guidelines & the No regrets playbook
- From 2028 on and before 2030, we must accommodate the new European design-for-recycling rules
- But simultaneously, in 2030, we will need recycled content that can only be produced from packages that comply to much more stringent design-for-recycling rules

Consequences of the use of recycled content

- Substances of concern cannot be present in the targeted material
- All non-targeted components that contain substances of concern and their precursors should be fully removable, and these should also not migrate
  - That is why there is focus on the removal of labels, sleeves…
- Well-designed packages suited for contact sensitive recycling should be recognisable and separately sortable

Most PET beverage bottles are exceptional

- High shares of PET ~90%
- All components are relatively easy to separate and remove
  - HDPE-caps and cap-rings are loose
    - Removed via milling and density separation
  - PP-labels are glued on only a small strip, which melts and dissolves > 60°C
    - Removed via milling, air classification, washing and density separation
    - Substances of concern remain in the labels
  - Most residues are removed by flake sorters
- SSP treatment
  - Restores the molecular weight of the PET resin
  - Removes volatile contaminants



Key lessons from food-grade PET recycling

- To make >99.9% pure, food-grade recycled plastic, recyclers need:

  1) well-designed packages,

  2) a feedstock that is exclusively composed of these well-designed packages,

  3) multiple, complementary, highly effective separation technologies

Prime substances of concern in recycled polyolefins

SoC	Example	Origin	CMR
Polycyclic aromatic hydrocarbons	Pyrene	Carbon black pigment	C
Primary aromatic amines	2-methyl aniline	Degradation of aromatic PUR tie-layer & azobenzene pigments	C
Nitrosamines	Diphenyl nitrosamine	Degradation of nitrocellulose ink resin	M
Phthalate esters	Bis(2-ethylhexyl) phthalate	Migration from printed labels	R
…what will be next?			

The list of precursors of substances of concern grows annually with new insights

Two strategies for mechanical recyclers

Use all packages as feedstock

- Use powerful deinking and decontamination technologies
- Execute elaborate migration tests for each batch of recycled plastic in combination with use case
- Small chance that EFSA will assess the risk as sufficiently well-managed

Use only well-designed packages as feedstock

- Use conventional decontamination technologies
- Execute a few migration tests to prove compliance
- Substantial chance that EFSA will assess the risk as negligible

Pathway for progress towards food grade recycled polyolefins

1. Packages should be <u>designed for food grade recycling</u>
   a) Hence, substances of concern and their precursors should be absent
2. Standardisation helps to make a business case for recyclers
3. Markers or codes required to allow the sorting of packages that are not only previous food-use, but rather well-designed for food-grade recycling
4. Decontamination technologies need to prove that they are also able to remove non-polar, high-molecular weight compounds, without creating new NIAS

Conclusion

- Today we can and must start with the first steps in improving packaging designs
- By 2030, the PPWR will change the current design-for-recycling guidelines into rules
- Simultaneously, the need for recycled content will create much stricter design-rules for food-grade recyclable packages

Thank you for your attention.

Any questions?

Program

11.00 Faglig program

CEN-guidelines an PPWR recyclability rules: What's the next step
Vincent Colard, CITEO

PPWR: An update on recyclability and recycled content
Henrik Nilsson, Näringslivets Producentansvar (NPA)

Att sätta pris på återvinningsbarhet
Love Pallon, Näringslivets Producentansvar (NPA)

Trygge valg i usikre tider: No-Regrets Playbook for emballasje
Bård Bringsrud Svensen, Grønt Punkt Norge

12.30 Lunsj

14.00 Faglig program

Preparing for PPWR: The Role of Pack for the Future
Karen van de Stadt, Verpact

How RecyClass Supports PPWR Targets and High-Quality Recycling
Nadir Mekki, RecyClass

Design-for recycling – what does it mean?
Ulphard Thoden van Velzen, Wageningen University & Research

Harmonisering av plastemballasje
Johannes Daae, Grønt Punkt Norge

The future of plastic sorting
Lisa Höflechner, Tomra

Handelens Miljøfond

Harmonisering av plastemballasje

Emballasje til emballasje gjenvinning; Ikke-mat hardplast

Dr. Johannes Daae

Utviklingssjef

Grønt Punkt Norge

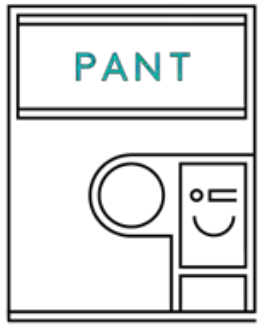
norner The Polymer Explorers · coop · UNIL · Orkla Home & Personal Care · Norsk Formblåsing Plastprodukter · Plastretur · Grønt Punkt Norge



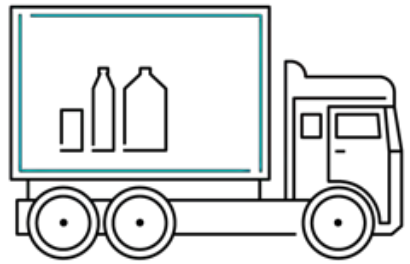
Pantesystemet



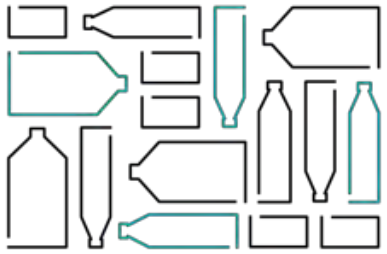
1. Forbrukeren



2. Panteautomaten



3. Transport



4. Sortering og komprimering



5. Plast og aluminium får nytt liv

Grønt Punkt Norge

Bilde: Infinitum

Object	**Clear PET**	**Coloured PET**	**HDPE**	**Not allowed**
Bottle material	PET	PET	HDPE, LDPE, PE	PLA, PVC, PS, PETG, PEN, PEF. Certain PET properties (refer to details in following sections)
Colour	Transparent, light blue transparent (refer to details in following sections)	All colours, less those not allowed.	All colours.	White, black, silver and shiny-pearly colours. Metallic colours or metallic additives. In PET TiO_2 or Carbon Black.
Barriers	Not allowed (exceptions exist).	Allowed to some extent, must be applied for.	Not allowed (exceptions exist).	EVOH, PVDC, PEN
Label and sleeve material	Most materials with density < 1 g/cm^3 (e.g., OPP, EPS, PE, PP, light/foam PET).			Density >= 1 g/cm^3 (e.g. PVC, PS, PET, PETG, OPS, PLA). Metallic materials. Non-laminated paper.
Ink (label print)	According to EuIPA guideline.			Water soluble inks, inks on EuIPA[1] exclusion list, inks with heavy metal content.
Glue	Water/alkaline soluble at 65℃			Re-activating glues.
Closure cap/valve	PE, PP, metal crown.	PE, PP, PET, metal crown.	PE, PP, PET, metal crown.	Metal screw-on caps.
Liner	PE, EVA, TPE			PVC, silicon, metal.

Bilde: Infinitum

Harmonisering av materiale i andre emballasjer

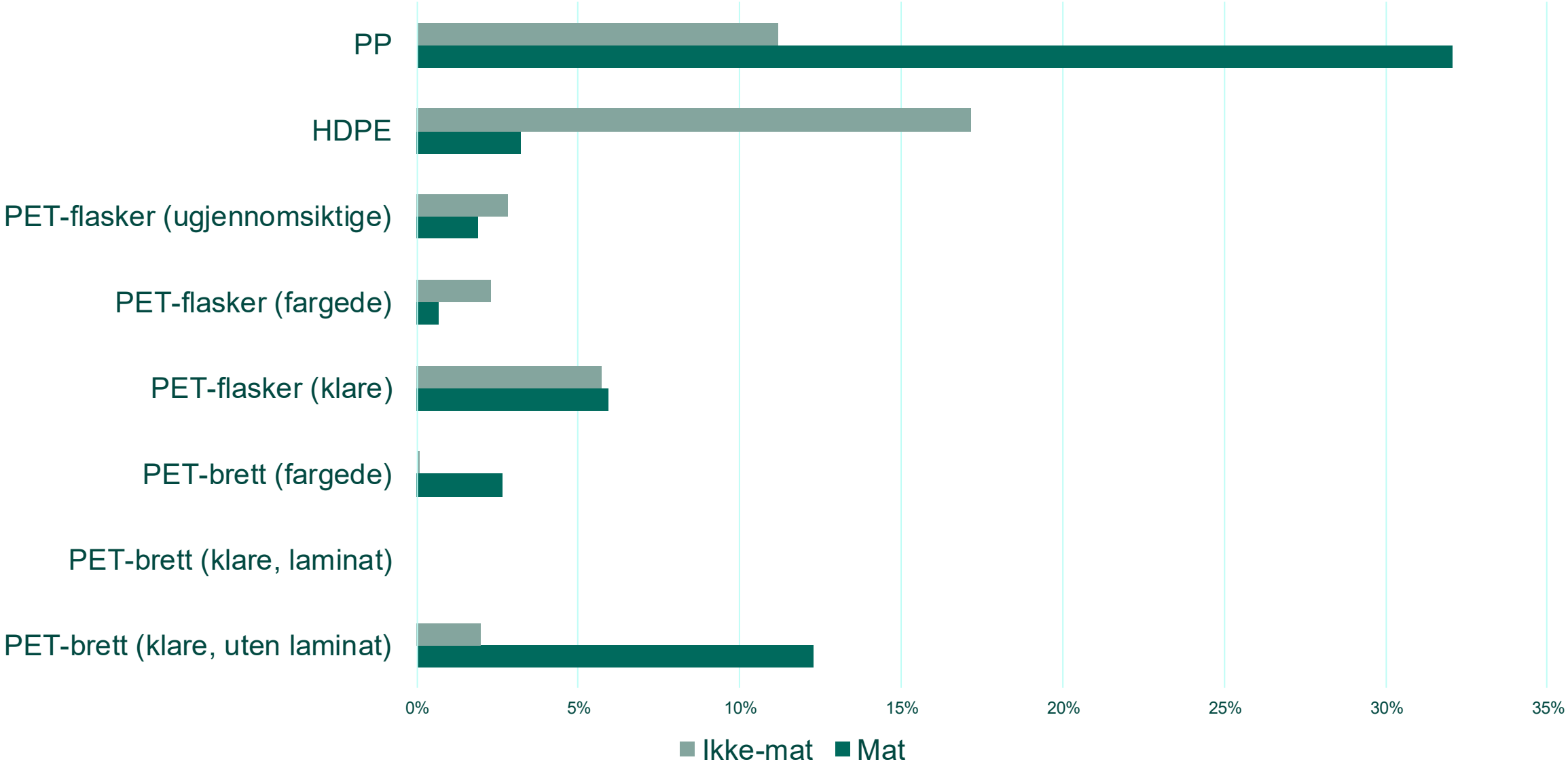


Bedre design for gjenvinning



Emballasje til emballasje gjenvinning?

Andel matemballasje og ikke-matemballasje i hardplast



Basert på plukkanalyse på kildesortert og restavfall utført av Mepex i Moss, våren 2025

PET
52

PP
4

PE
74

Bilde: Grønt Punkt Norge

Plastretur og Tomra finsorteringsanlegg

Områ



Foto: Lars Skjetne RELOG

Men vår emballasje er så viktig for å skille oss ut fra konkurrentene!



Bilde: KI



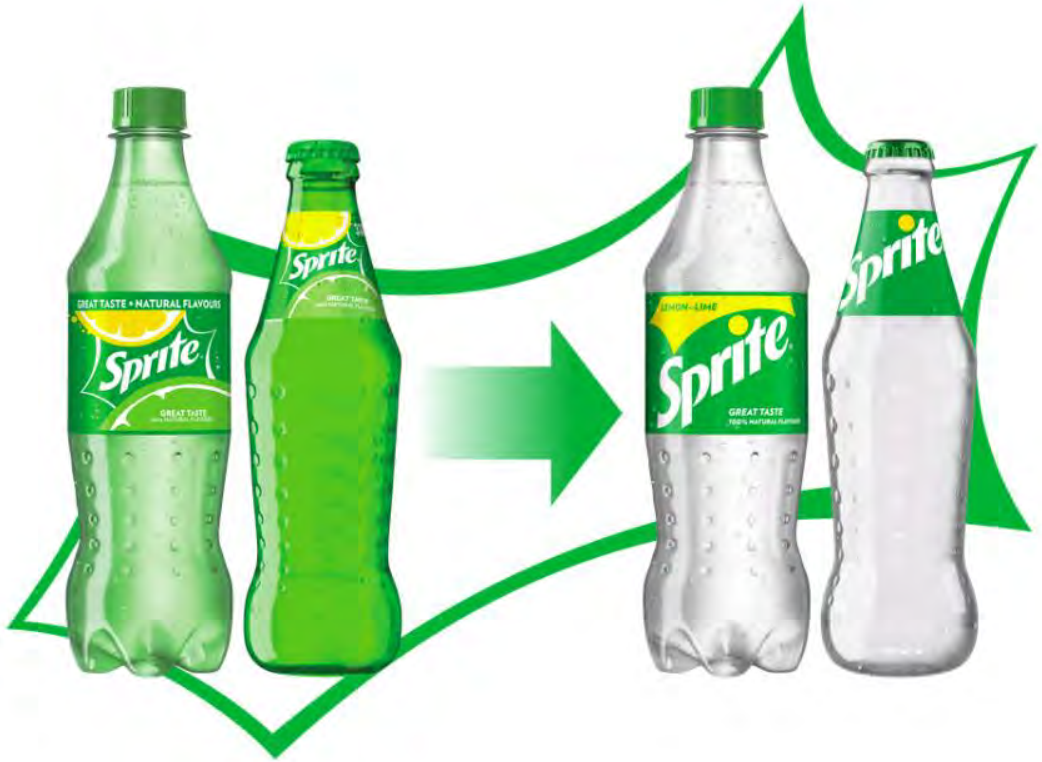
Bilde: Grønt Punkt Norge

Nå forsvinner den grønne Sprite-flaska

20.5.2020 08:55:59 CEST | Coca-Cola Norge og Coca-Cola Europacific Partners Norge | Pressemelding

Del

Den ikoniske, grønne Sprite-flaska har vært i butikkhyllene i 58 år. Nå forsvinner den, og erstattes med gjennomsiktige flasker.





Bilde: Grønt Punkt Norge


AGURK SYLTET
45,90 /STK
AGURK SYLTET
47,90 /STK
AJVAR
73,90 /STK
AJVAR HJEMMELAGET
69,90 /STK
RØDBETER
31,90 /STK
AUBERGINSALAT
79,90 /STK
CHERRYTOMATER
39,90 /STK
Bilde: Grønt Punkt Norge



Bilde: Grønt Punkt Norge



Bilde: Grønt Punkt Norge

Harmonisering av materiale i andre emballasjer



Bedre design for gjenvinning



Emballasje til emballasje gjenvinning?



Ombruksemballasje?

Unlocking a reuse revolution: **scaling returnable packaging**



Ellen MacArthur foundation





Bilde: Ellen MacArthur foundation - Unlocking-a-reuse-revolution-Scaling-Returnable-Packaging.pdf



Bilde: Ellen MacArthur foundation - Unlocking-a-reuse-revolution-Scaling-Returnable-Packaging.pdf

Hva skal til for at Norsk kildesortert og maskinellt utsortert HDPE skal egne seg til samme type emballasje?

Vasking

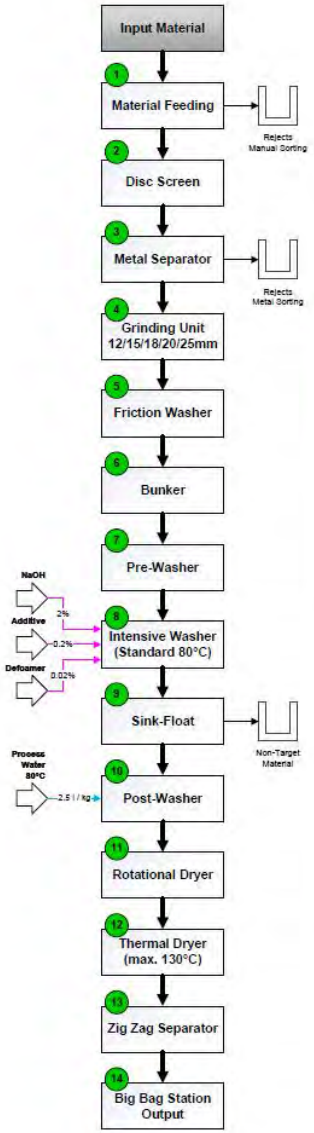


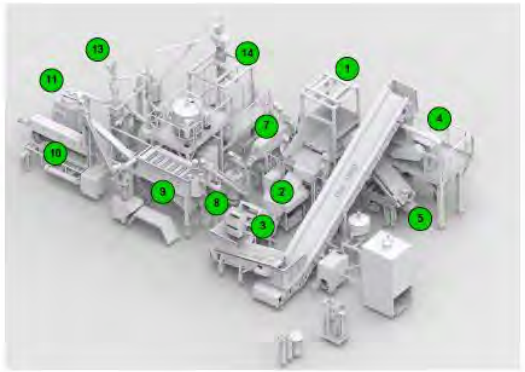
Fargesortering

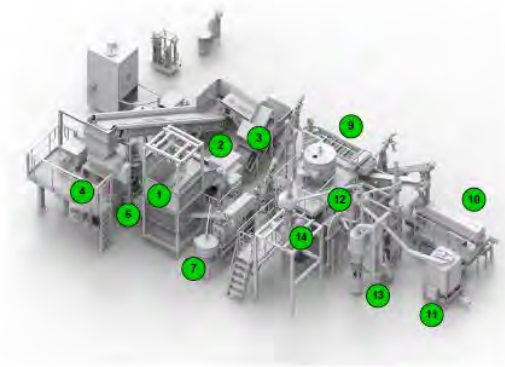


Produksjon av ny emballasje

Vasking av kildesortert og maskinelt utsortert HDPE







Renhet kildesortert 93,42%
Renhet maskinelt utsortert 90,53%



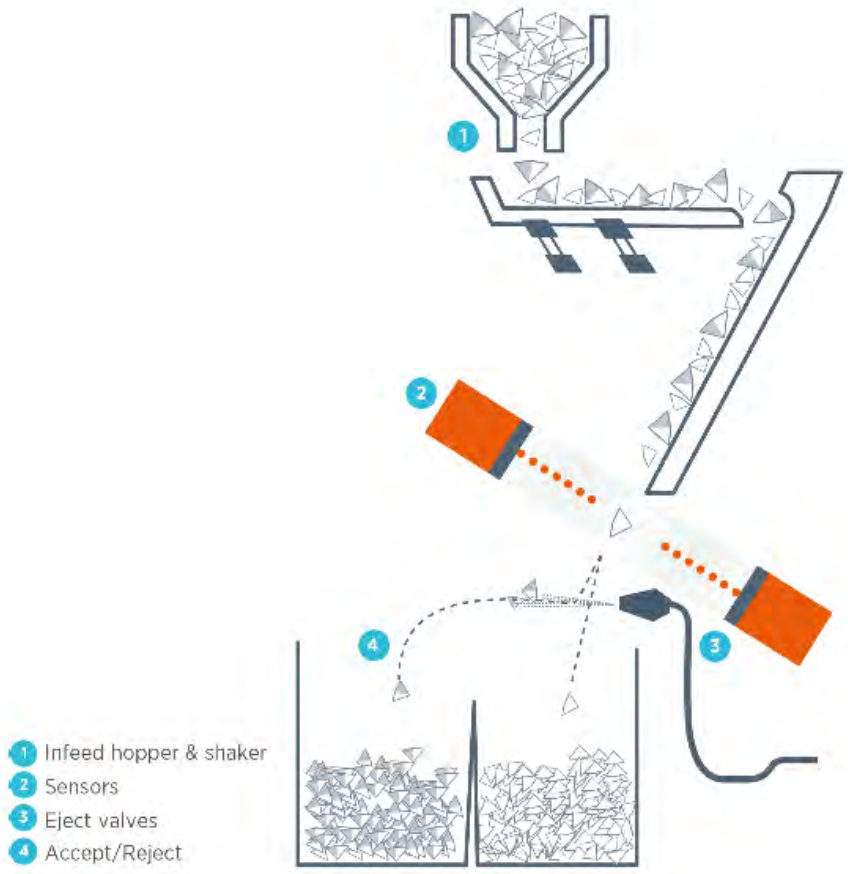




Grønt Punkt Norge

Bilder: Norner

To trinns fargesortering av plasten





Input: ca. 73% hvit
Utsortert som hvit: ca 70%
Renhet av utsortert hvit: ca 100%

Ca. 30% tap på grunn av feil hvitfarge

Bilder: Norner

Emballasje med 100%, 65% and 35% gjenvunnet plast

Materialanalyse

Test navn	Metode / Standard
MFR 190°C / 2.16 kg	Internal method (Melt Flow Index)
Density	ISO 1183-1
FTIR Identification	Internal method (FTIR)
Dynamic Rheology	ISO 6721-10:2015
Tensile Test	ISO 527-1 / 527-2
Charpy Impact (23°C N)	ISO 179
Ash Content + EDS	ISO 3451-1 Method A

Flaskeanalyse

Test navn	Metode/ Standard
Dimensions	ASTM D2911
ESCR Bottle Test	M731014
Top Load	M730091
Color CIE L*, a*, b*	Internal method (Color CIE L*, a*, b*)
Drop Test	M730782



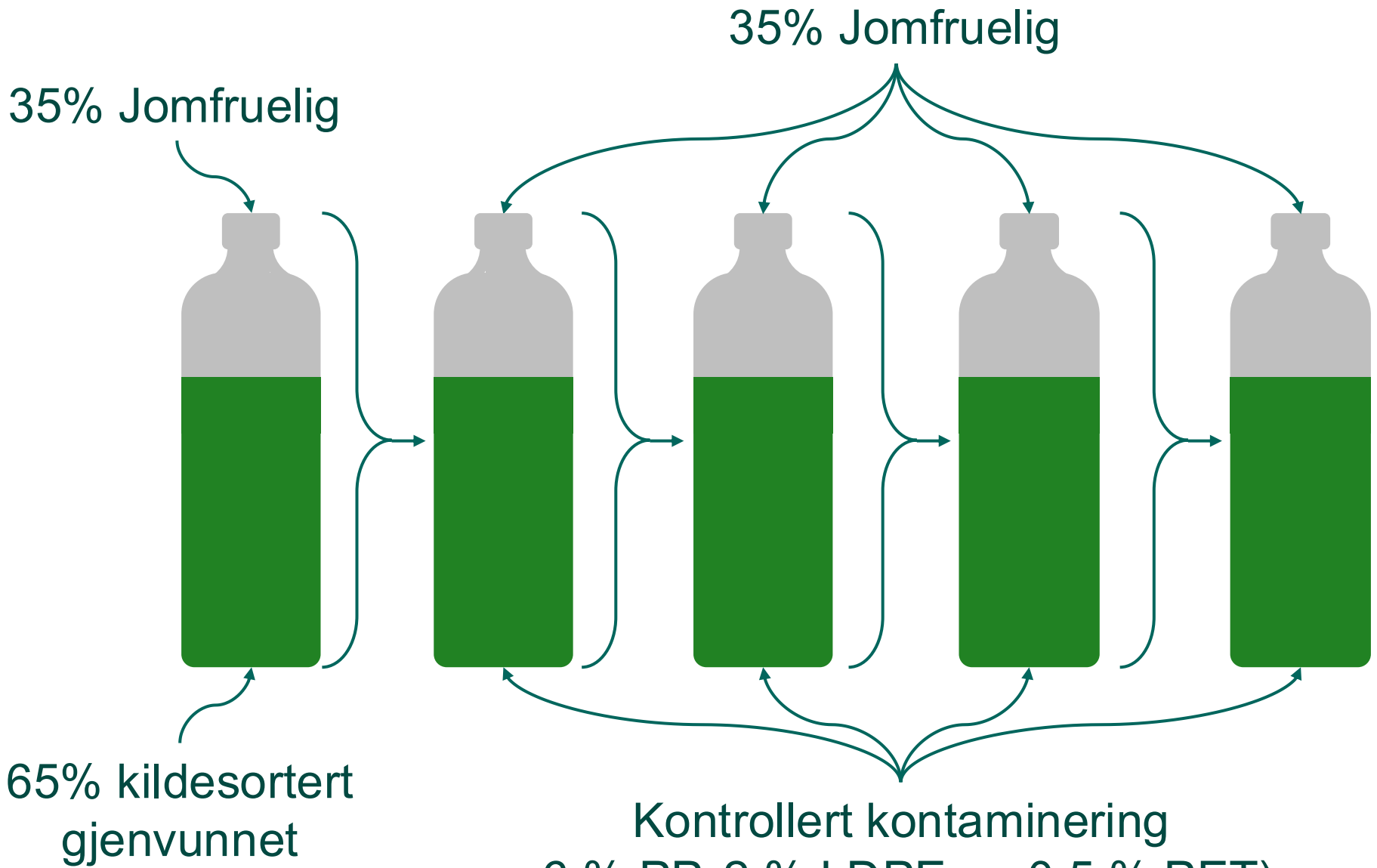


Bilder: Norner

Resultater av analysene

- Kildesortert bedre enn maskinelt, men begge egnet til emballasje
- Hvit gjenvunnet plast er bedre enn farget gjenvunnet plast, men begge egnet til emballasje
- 35% bedre enn 65% gjenvunnet plast, men begge er egnet til emballasje
- 100% gjenvunnet plast er mulig til å bruke I emballasje, men med større utfordringer

Er kildesortert HDPE god nok til å gjenvinnes i mange sykluser?



Spesifikasjon for harmonisering av non-food HDPE

	Hvit HDPE	Farget HDPE
Flaske-/beholderkropp	HDPE	HDPE
Fargestrategi	Naturell/ hvit HDPE	Farger må være tydelig forskjellige fra hvitt
Barrierer	Kun barriereteknologier godkjent i kalkulatoren/ RecyClass	Samme prinsipp
Tilsetningsstoffer og fyll	Nødvendige prosessadditiver er akseptable. Mineralfyllstoffer så lenge tetthet forblir under 1 g/cm³	Samme prinsipp
Etiketter og sleeves	PE- eller PP-etiketter/sleeves med tetthet under 1 g/cm³ foretrekkes	Samme prinsipp
Lim	Lim skal kunne separeres i gjenvinningsprosessen	Samme prinsipp
Trykk	Trykkfarger skal følge EuPIA-retningslinjene og ikke blø under vask. Direktetrykk bør ungås	Samme prinsipp
Korker og fest	HDPE, LDPE, LLDPE, MDPE eller begrensede mengder PP	Samme prinsipp
Emballasjedesign	Monomateriale HDPE foretrekkes. Emballasjen bør tømmes effektivt, minimere rester og være robust	Samme prinsipp
Resirkulert innhold	PCR HDPE med dokumentert opprinnelse. Inntil 65 % PCR kan benyttes dersom ytelse og prosessstabilitet opprettholdes	Høyere andel resirkulert innhold kan brukes dersom ytelse og prosessstabilitet opprettholdes

Potensielle fordeler ved harmonisert emballasjemateriale

- Stabil tilgang på høykvalitets PCR
- Mulighet for å kommunisere “Lukket kretsløp” i markedsføring
- Enklere design ved å “følge oppskrift”
- Lavere priser på materialet på grunn av større volumer av samme
- Enklere overgang til ombruksemballasje
- Færre ulike emballasjer som krever dokumentasjon
- Mer emballasje blir gjenvunnet og brukt i ny emballasje



Veien videre:

- «Content artikkel» om prosjektet
- Prosjekter hos medlemmer (CPC?)
- Søke om tilsvarende prosjekt for rigid matemballasje, harmonisert med prosjekt i Nederland

Takk for oppmerksomheten!

Grønt Punkt Norge

Johannes Daae, ph.d
Utviklingssjef
Telefon: +47 99 00 53 56
Epost: johannes@grontpunkt.no

Program

11.00 Faglig program

CEN-guidelines an PPWR recyclability rules: What's the next step
Vincent Colard, CITEO

PPWR: An update on recyclability and recycled content
Henrik Nilsson, Näringslivets Producentansvar (NPA)

Att sätta pris på återvinningsbarhet
Love Pallon, Näringslivets Producentansvar (NPA)

Trygge valg i usikre tider: No-Regrets Playbook for emballasje
Bård Bringsrud Svensen, Grønt Punkt Norge

12.30 Lunsj

14.00 Faglig program

Preparing for PPWR: The Role of Pack for the Future
Karen van de Stadt, Verpact

How RecyClass Supports PPWR Targets and High-Quality Recycling
Nadir Mekki, RecyClass

Design-for recycling – what does it mean?
Ulphard Thoden van Velzen, Wageningen University & Research

Harmonisering av plastemballasje
Johannes Daae, Grønt Punkt Norge

The future of plastic sorting
Lisa Höflechner, Tomra

THE FUTURE OF PLASTIC SORTING

Lisa Höflechner

Pack for the Future

21.10.2026
Oslo

TOMRA



Publicly listed on Oslo Stock Exchange (OSEBX: TOM)

Collection

Transforming society's habits to keep valuable resources in a continuous loop of use and reuse.

Recycling

Giving every piece of material we sort and analyze – may it be waste, metal or ore – a value.

Food

Our sorting, processing and packing solutions help to maximize food safety and minimize food loss.

Horizon

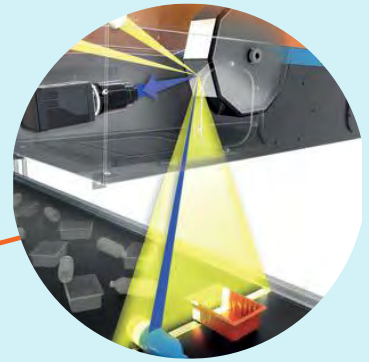
Exploring new, adjacent and alternative opportunities for our technology and solutions to leading the resource revolution.

State of the art sorting with AUTOSORT™

NIR/VIS
Near Infrared & Visible Spectrum

EM
Electromagnetic Sensors





FLYING BEAM™
with SHARP EYE™
technology



DEEP L**AI**SER™
(optional add-on)

As of today, most of the sorting tasks in packaging are already solved with state-of-the-art technologies

Solved with state-of-the-art

- Separation by polymer type
- Separation by color
- HDPE vs. LDPE
- PET trays vs. bottles
- PET trays mono vs. multilayer
- PP flexibles
- Beverage Cartons
- Etc.

Solved with advanced sorting

- PP food vs. non-food
- HDPE food vs. non-food
- PET trays food vs. non-food
- Aluminum UBC sorting
- Granular Paper Sorting
- PET bottle food vs. non-food

Potential with advanced sorting

- PO flexibles food vs. non-food
- Sorting by MFI

TOMRA

*UBC = Used Beverage Cans

Advanced sorting technologies

What and Why?

The main purpose of introducing advanced sorting technologies is to solve the unsolved problems like **food vs. non-food and to increase the sorting efficiency.**



Digital Watermarks



Object Recognition - AI

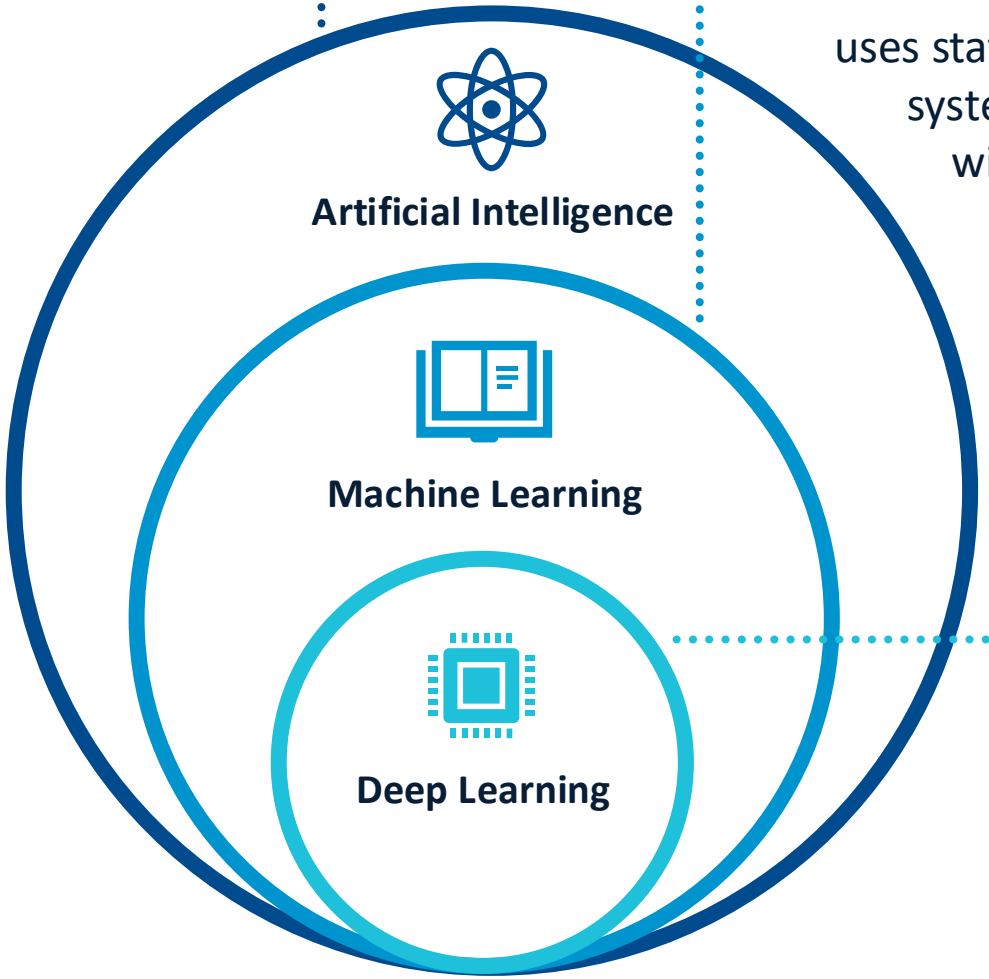


UV Markers

TOMRA

From AI to deep learning: what we really use

Artificial Intelligence (AI)
is any technique that enables computers to mimic human intelligence, using logic, if-then rules, decision trees and machine learning.

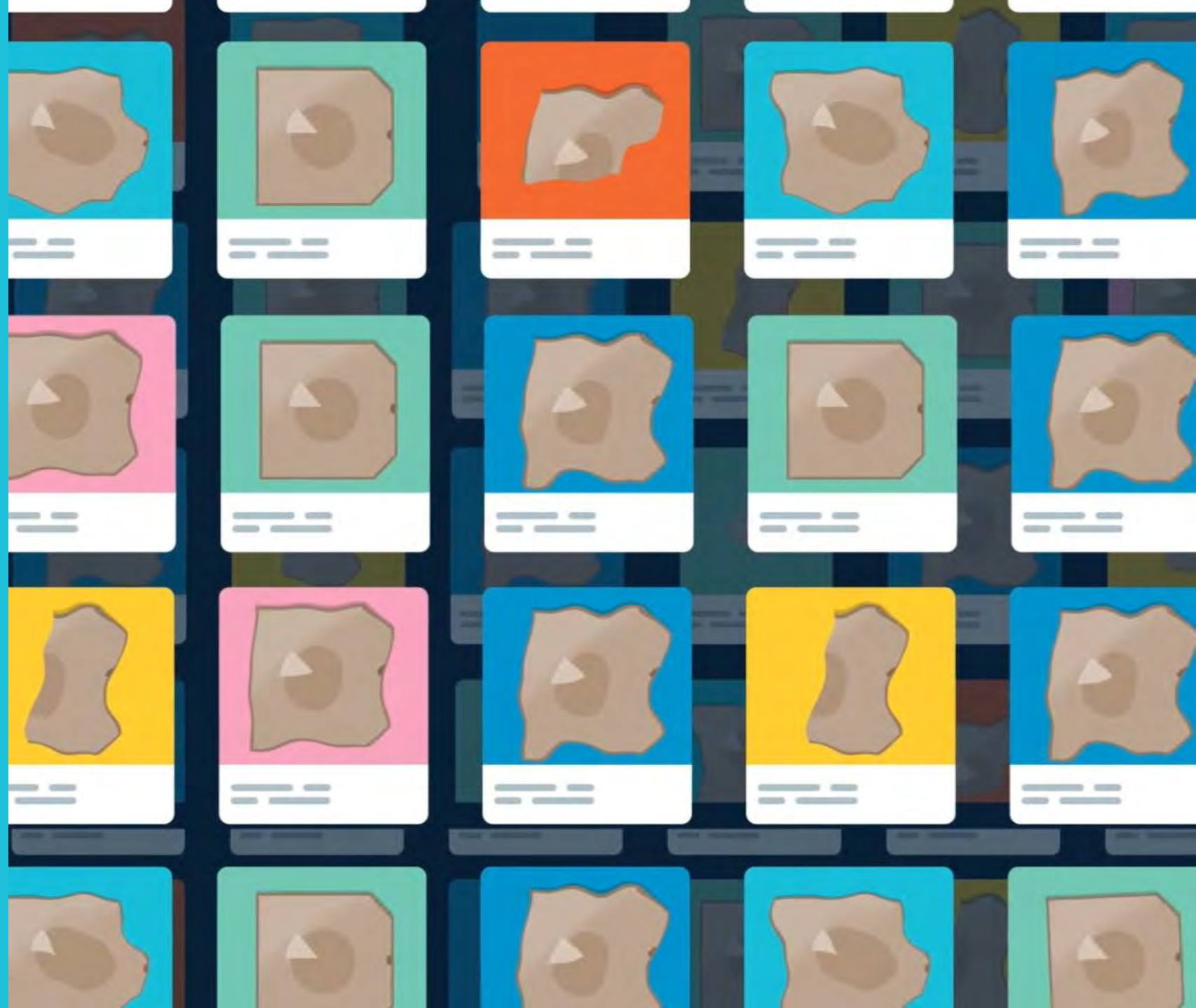


Machine Learning (ML)
uses statistical techniques to give computer systems the ability to "learn" from data, without being explicitly programmed.

Deep Learning (DL)
is a class of ML algorithms that use many layers in Artificial Neural Networks

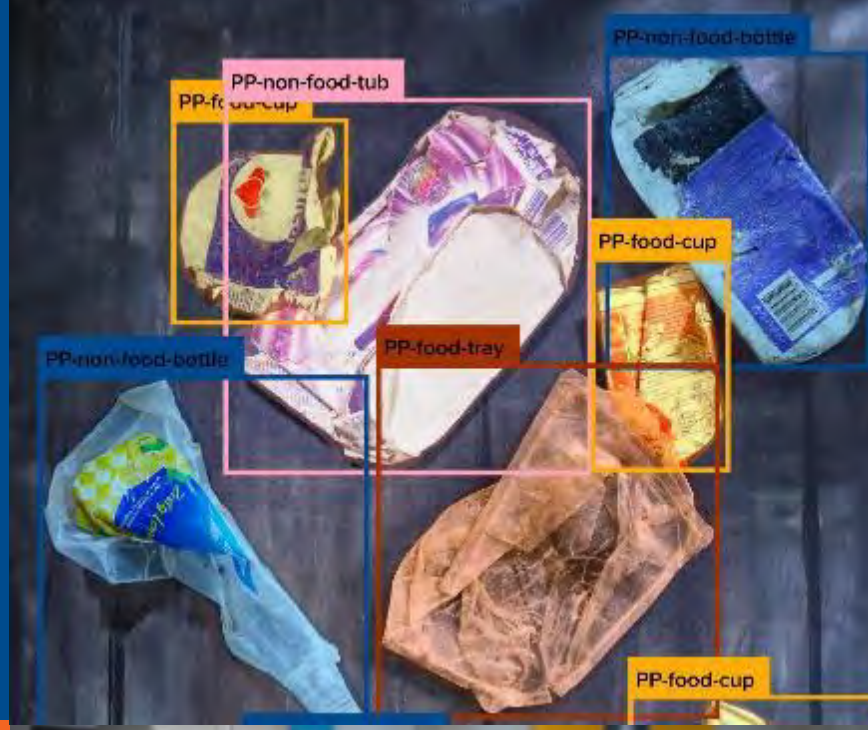
How we train the network at TOMRA

- Our engineers and recycling experts train the network with millions of labelled images
- Real-world material: including broken, bent and deformed objects
- It learns visual features: shape, texture, print
- New images keep extending the training over time

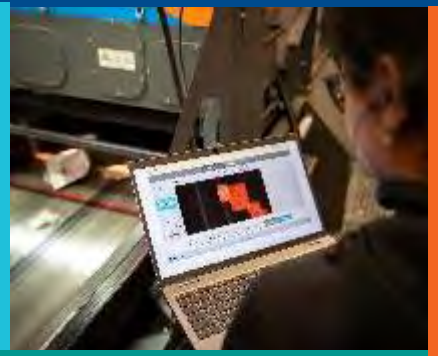


GAINnext™

AI-powered sorting system with deep learning technology



Automates manual sorting





RGB CAMERA

NIR/VIS

Near Infrared & Visible Spectrum



The true power comes from combining deep learning with traditional sensors

NIR Sorting

Detects material composition



Deep Learning Sorting

Detects based on size, shape and features
e.g. food vs. non-food



Multi Sensor Approach

Detects material composition and
e.g. food vs. non-food



Berry Circular Polymers, Leamington Spa, UK

Customer case: food-grade rPP

- State-of-the-art plant where operations began in 2023
- Recovering 48,000 tpa of post-consumer Polypropylene (PP)
- Berry's CleanStream technology is the world's first closed-loop system to mechanically process post-consumer rPP back into food-grade packaging

GAINnext™:

- Removes PP food-grade from non-food grade packaging
- Delivers consistent food-grade rPP tray feedstock for Berry's wash process
- Eliminated the need for manual sorting



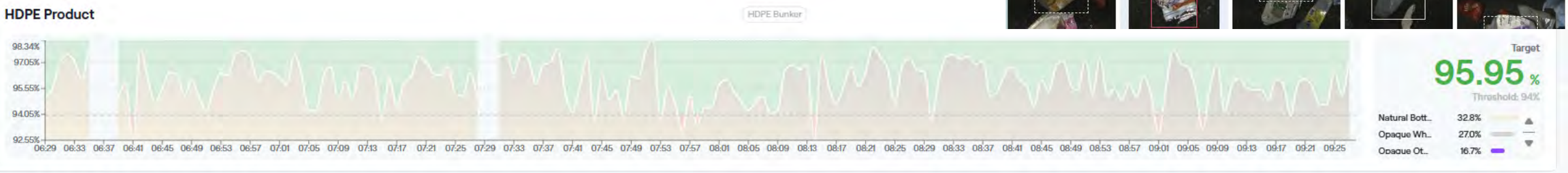


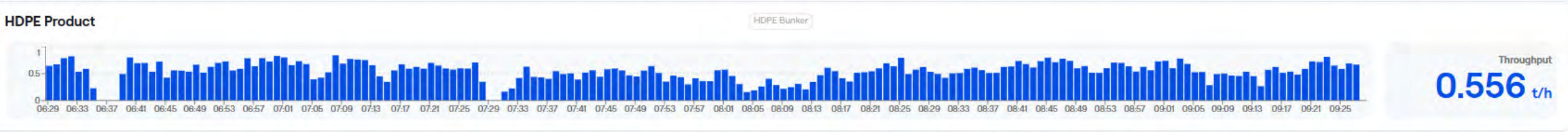
Polyperception



Quality Control and Assurance

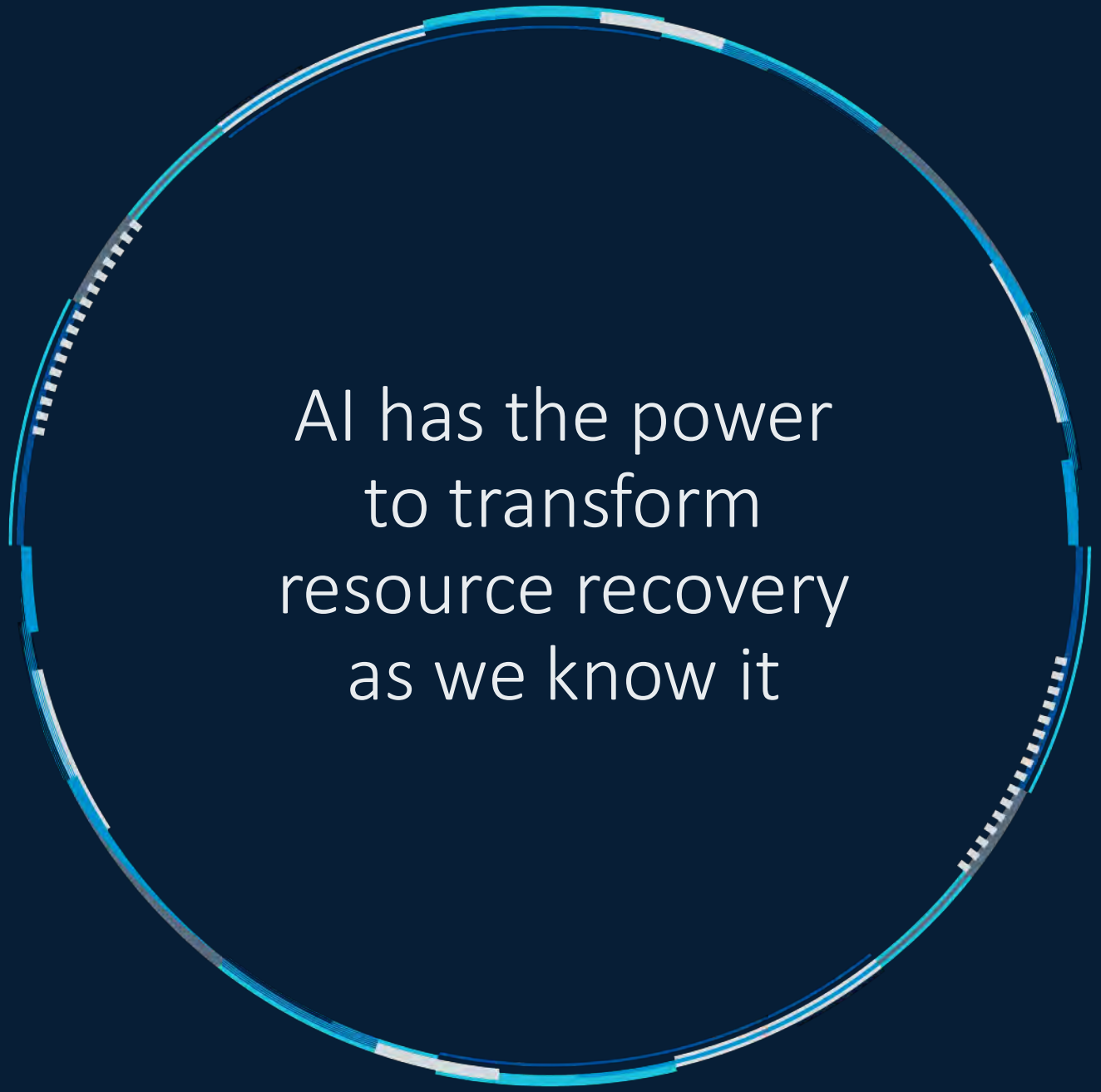
- weight related quality
- compliance reporting
- real-time analysis





Flexibility to adapt to market demands

High-level automation



Sorting of new material streams

Data-driven optimization

Thank you for your attention!

Lisa Höflechner

Business Development Manager

TOMRA Feedstock

Lisa.hoeflechner@tomra.com

Mobile: + 4748007681

Takk for oppmerksomheten!

Grønt Punkt Norge

NÄRINGSLIVETS PRODUCENTANSVAR