Creating Circular Economy in Food Packaging

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Content:

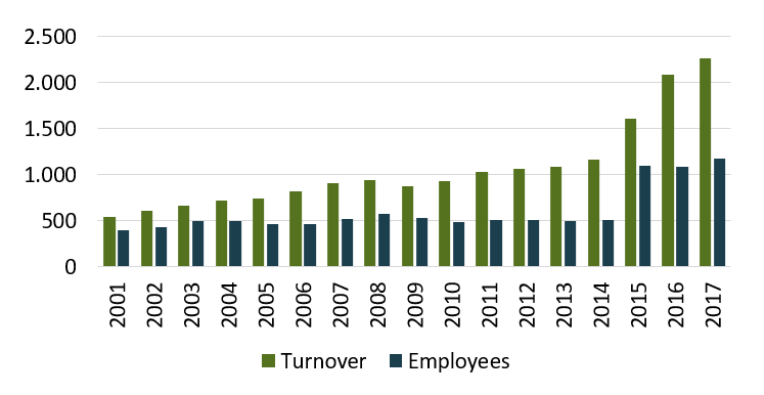
- Faerch
- Environmental discussion.
- Three global agendas.
- PET's unique position in recycling.
- Three loops – Three different qualities.

(Bio-)Polymers and Ecocircularity:
From Challenges to Opportunities
8th – 9th May 2019 Gosselies, Belgium

faerch

Færch

- Founded in 1969
- Owned by global private equity fund Advent International
- Key Figures 2017, Færch Group
  - Turnover: DKK 2,267m (EUR 304.6m)
  - EBT: DKK 203m (EUR 27.3m)
  - Employees 2017 (avg.): 1,175



WORLDWIDE DELIVERY

Manufacturing

Recycling (four sites)

Sales

Design & Innovation

MANUFACTURING LOCATIONS


Holstebro
Denmark


Durham
United Kingdom


Sutton
United Kingdom


Poole
United Kingdom


Buñol
Spain


Liberec
Czech Republic


Annecy
France


Lorient
France


Druiven
Netherlands


Arnhem
Netherlands


Raamsdonskveer
Netherlands


Druten
Netherlands

Since Sept 2018 –
Integrated PET Recycling

BUSINESS SEGMENTS

READY MEALS

FRESH MEAT

FOOD TO GO

VALUES

Faerch want to be the most reliable and competent supplier of protective packaging for the food industry and we strive to be known for our quality, innovation product design and customer service, as well for our honesty, credibility and accountability.

We want to be the industry leader in material, process and tooling technologies. **Our ambition is to lead the industry's efforts in making food packaging circular, offering fully recyclable products based on market-leading share of post-consumer content.**

We will invest in our people and foster collaboration, whilst providing attractive opportunities for individual growth.

Environmental Discussions

Carbon footprint & Global warming

Faerch:	PP	Mineral filler	c. 2004 ->
	PET	Recycling	c. 2007 ->

APET
Virgin raw material
EU average electricity mix

~ 38.7 g of CO_2 eq
emission per tray *)

APET (75% rPET)**
100% renewable electricity

~ 21.4 g of CO_2 eq
emission per tray *)

Compostable solutions

Faerch:	PP	Disc. c. 2004	Not implemented
	PLA	Marketed	c. 2004 -> 2009

Fossil Black → **Bio Based feed stock Green Chemistry**

Faerch:	PLA	Marketed	c. 2004 -> 2009
	PEF	?	

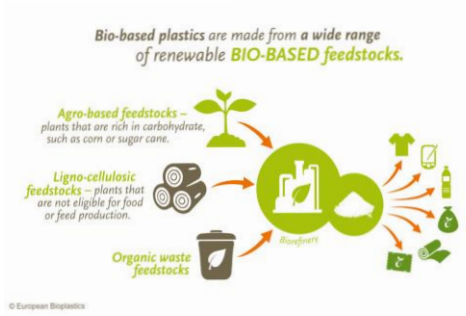
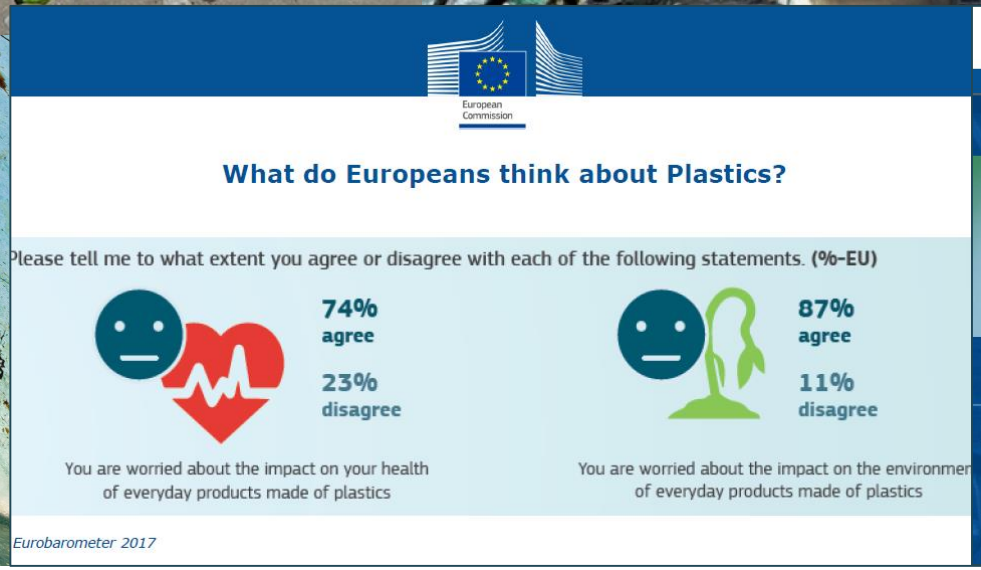
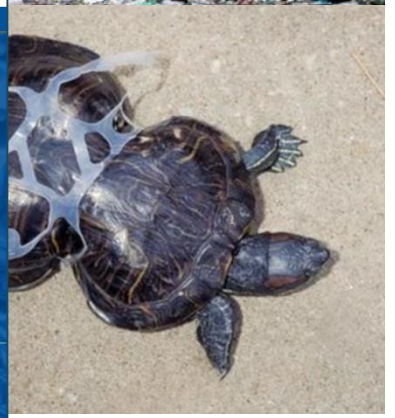


Illustration: European Bioplastics

Environmental Discussions





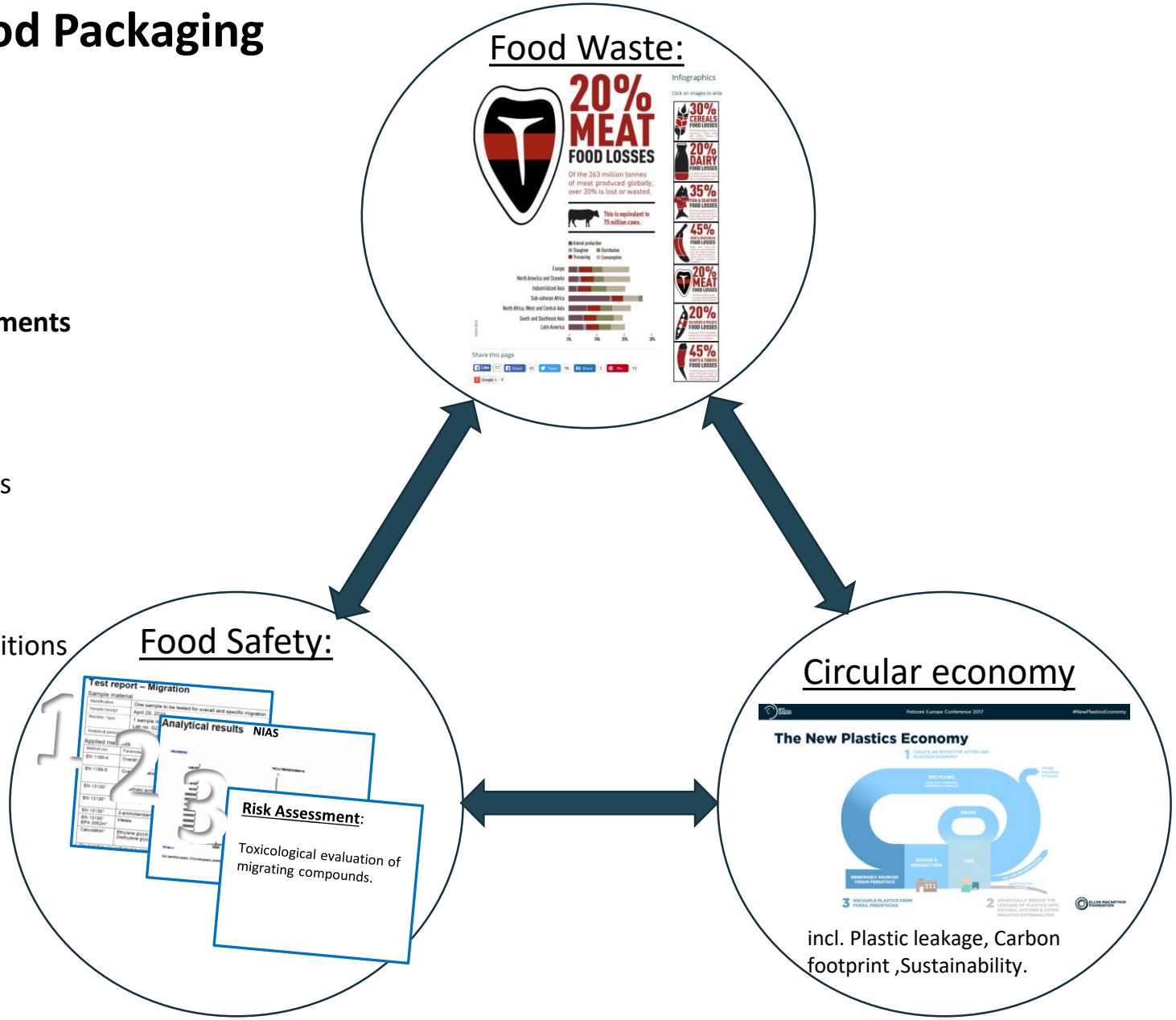
Global Agendas in Food Packaging

- A balance of key interests

PET is in a unique recycling position
- meets all three requirements

- De facto Standard
- Process stability
- Regeneration of technical properties
- Decontamination

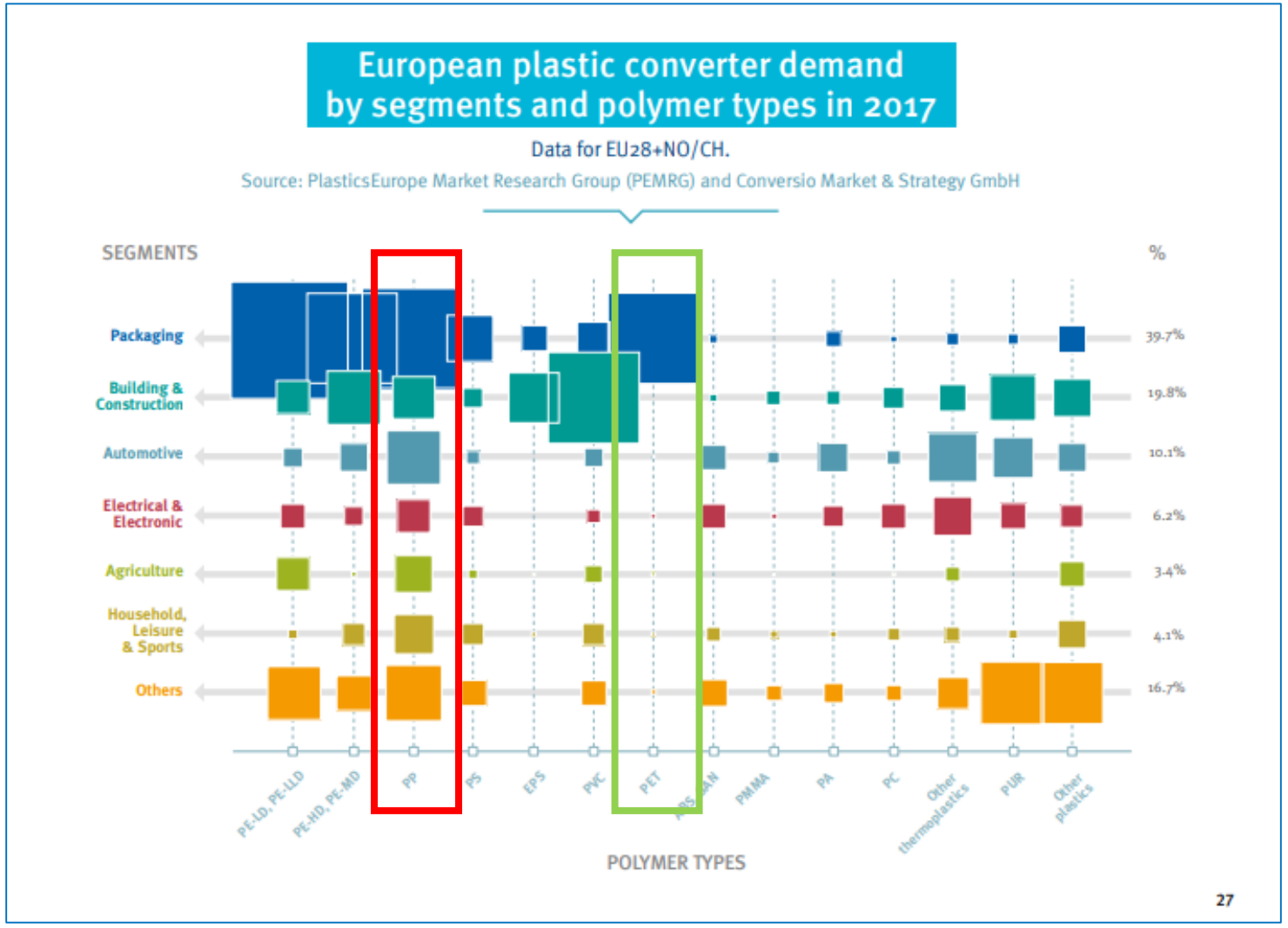
- Challenge: Demanding sealing conditions



PET’s Unique Recycling Position

De facto standard

- Relevant Materials: PET PP
- Excellent properties for packaging applications.
  - Barrier
  - Clarity
  - Impact
  - Food contact status
- PET only for packaging
  - Injection strech blow moulding
  - Extrusion
- Multiple applications drive
  - Multiple additives, critical to food contact status
  - Multiple compounds ; copolymers
  - Multiple processes
- Multiple processes drive
  - Multiple grades (viscosities ; Mw)



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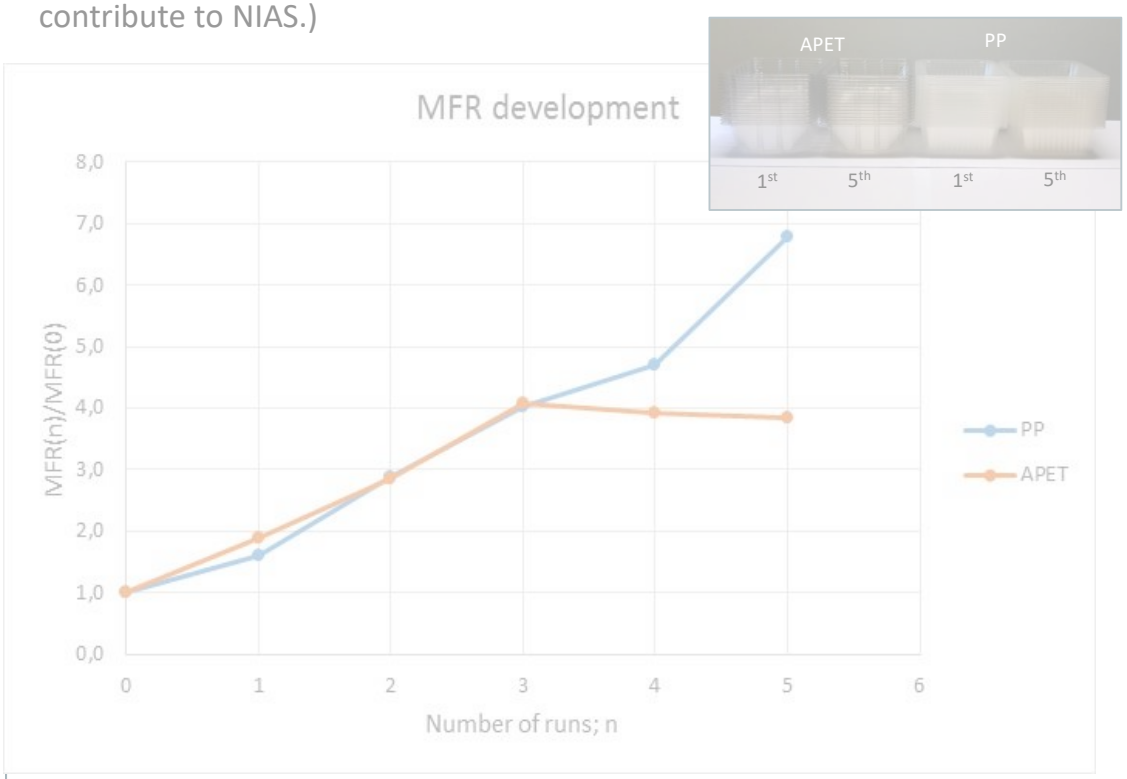
PET’s Unique Recycling Position

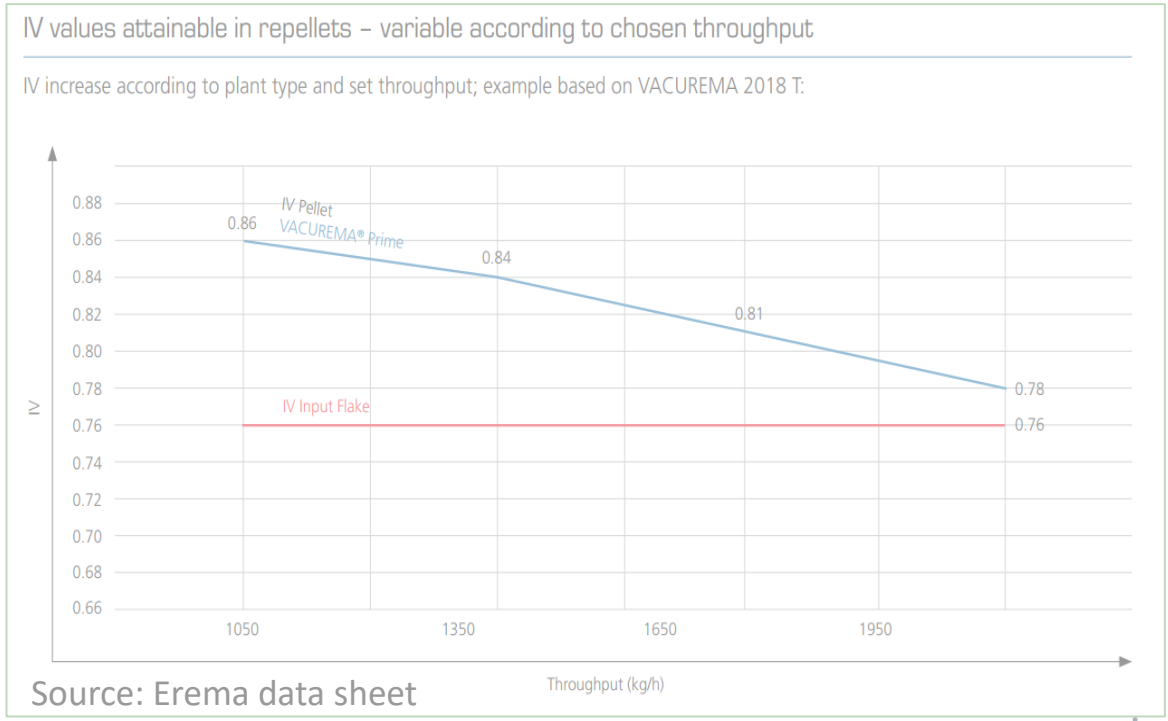
Process stability

- PET degradation is in general dominated by hydrolysis and shear (hypothesis)
- PET: “Steady state” in internal recycling test likely related to shear.
- PET: Minimal thermal degradation, stabilizers not required. (Stabilizers contribute to NIAS.)



Regeneration

- Regeneration of molecular weight is a standard process for PET.
- Regeneration of M_w and removal of volatile contaminants are same process. (Decontamination process; EFSA 282/2008)



Source: Erema data sheet

Sheet re-extruded internally 5 times.
PP: High speed 5 zone single screw; MFR(Ø2,095mm; 2,160 kg; 230°C)
APET: Vacuum twin screw; IV/MFR(Ø2,095mm; 2,160 kg; 285°C)

PET’s Unique Recycling Position

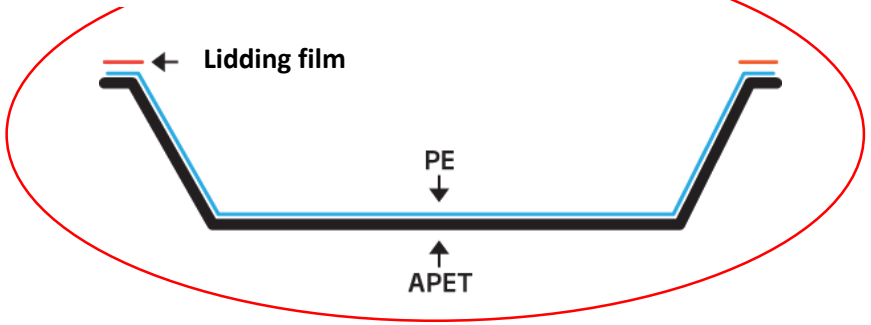
Challenge: Demanding sealing conditions

Seal through contamination on meat trays is demanding.

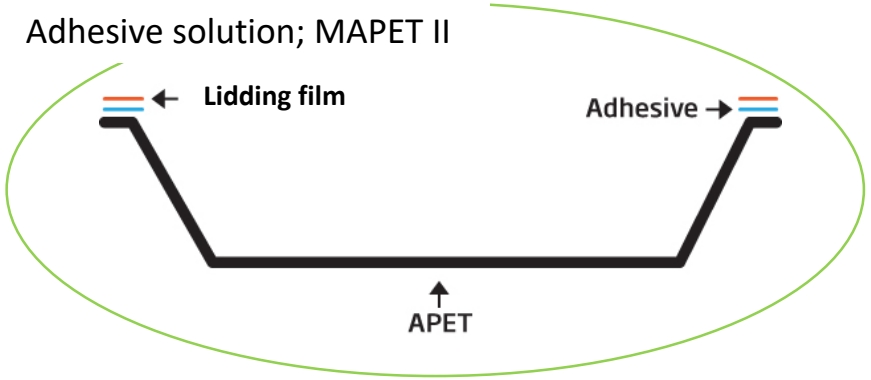
APET/PE:
PE is partly removed on dedicated tray washing lines.

MAPET II:
Adhesive solution is to reduce ”contamination ”content.
Adhesive is partly removed on dedicated tray washing lines but preferably peeled from the tray with the lidding film.

Standard APET/PE multi-layer solution



Adhesive solution; MAPET II



Færch has Closed the Loop

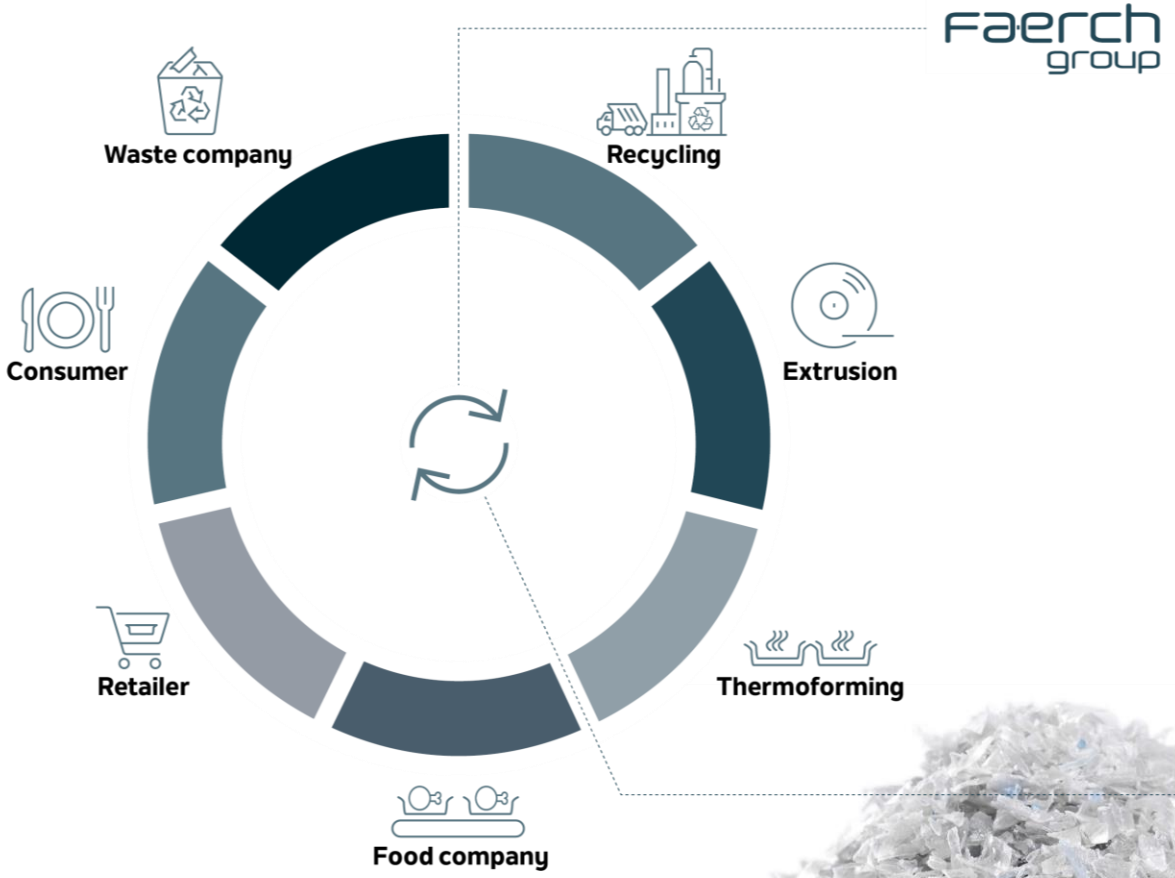
Three Different Systems

- Household waste systems (Yellow bag / Curbside)
- Bottle deposit systems
- Catering systems

Increasing disorder –
Increasing energy to regain order

First Catering trays returned for recycling.

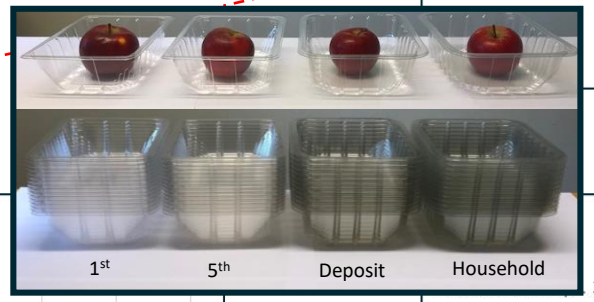
March 13th 2019

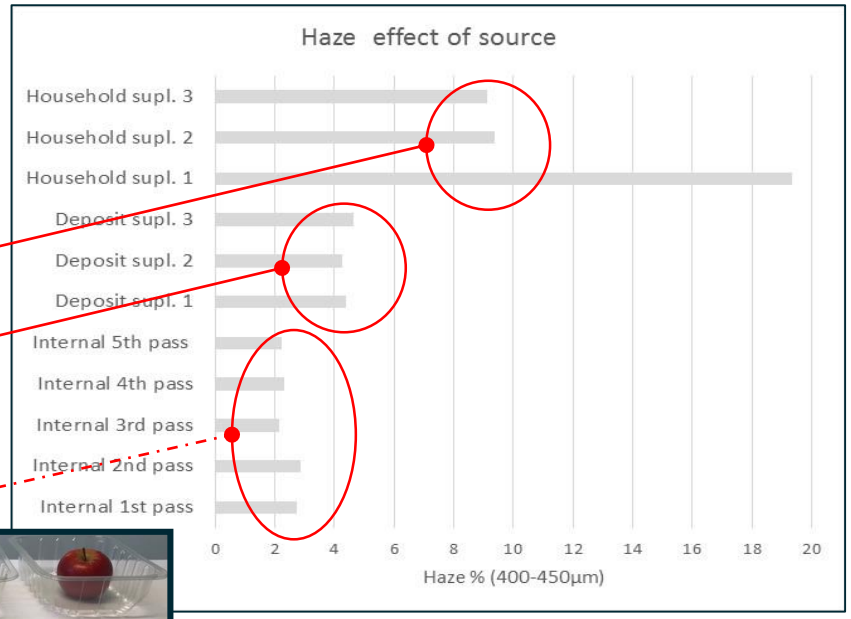


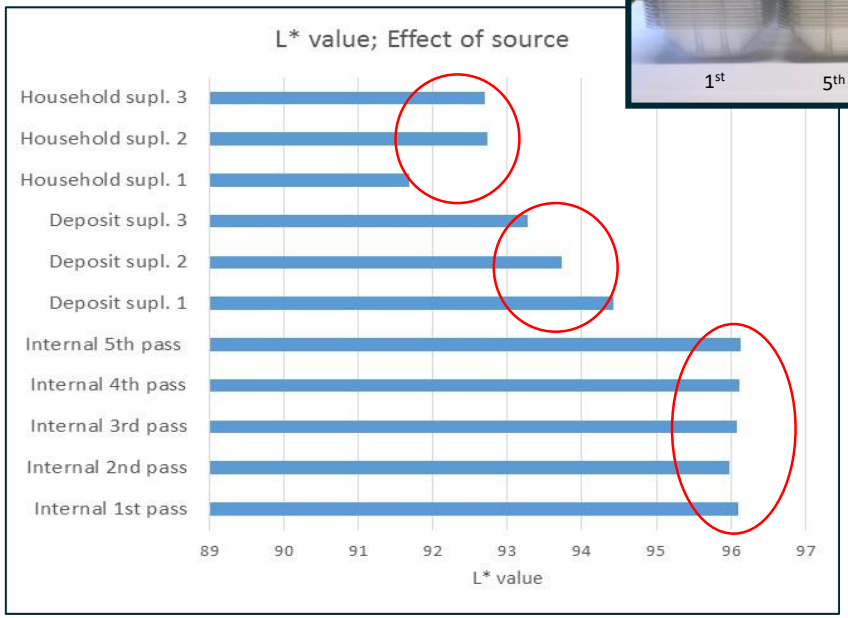
Færch has Closed the Loop

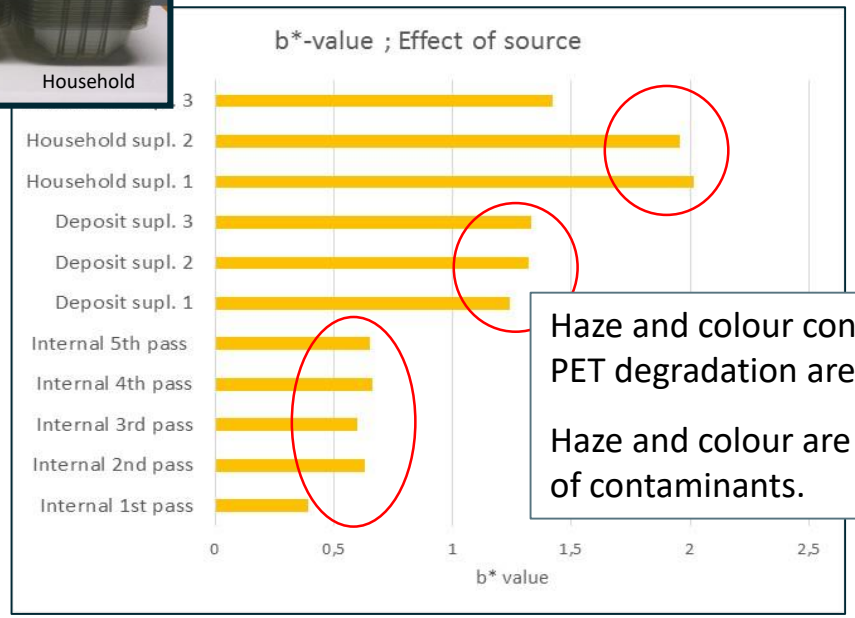
Three different Systems – Three different Quality levels

- Household waste systems (Yellow bag / Curbside)
- Deposit bottle systems
- Catering systems









Increasing disorder –
Increasing energy to regain order

Haze and colour contributions from PET degradation are minimal.

Haze and colour are mainly a result of contaminants.

Description:
Product: Clear APET sheet; 410-450µm
Material sources:
- Three based on house holde waste. All UK.
- Three based on deposit bottles.
- Data from internal "100%" recycling.

Haze: ASTM D1003
L a b: ASTM E1164 ; DIN 5033 part 7

Færch

Closing the loop on food trays

Integrated recycling

faerch 4PET