





A challenge for converters

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#### Consumers are increasingly concerned about sustainability



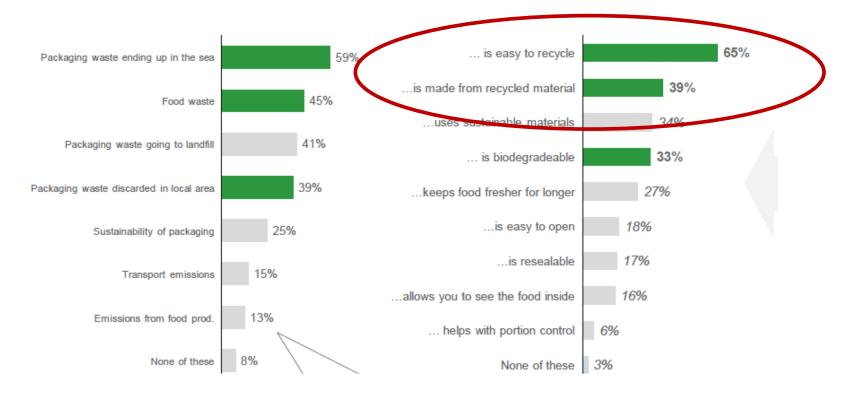
#### Consumer attitudes to food packaging and waste 2020

Q: "Which of the following are you most concerned about?"

Respondents to select up to 3

Q: "It's most important that food packaging..."

Respondents to select up to 3



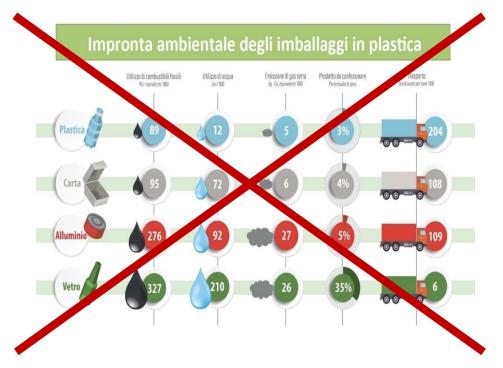


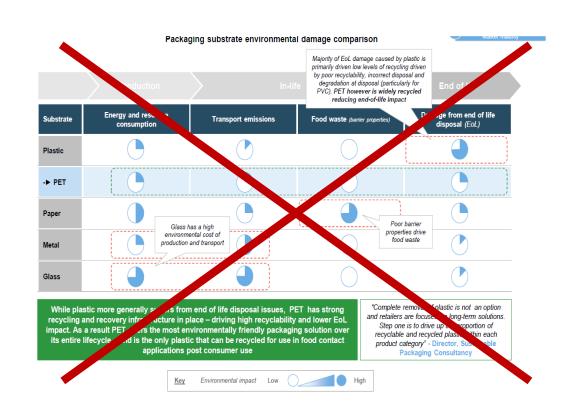
Source: AMB

















## Recycled?



Mechanical recycling?

**«Bottle to bottle» repelletizing recycling?** 

FTR (Flake to Resin) recycling?

**Chemical recycling?** 

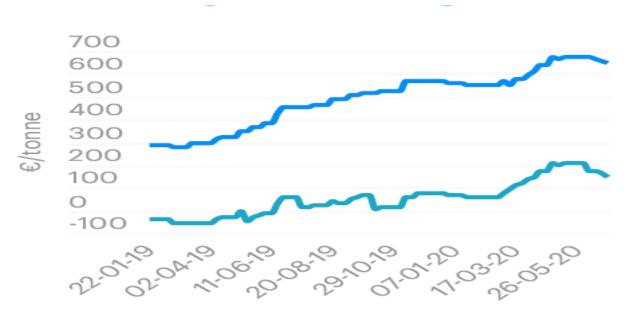
...?







#### rPET food grade, PCF spread over virgin PET



- R-PET colourless flake FD NWE price mi...
- R-PET Food Grade Pellet price minus vir...



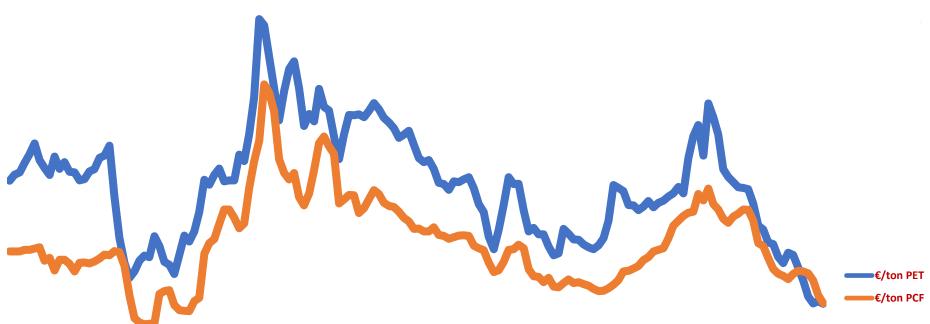
Source: Icis



plast









gen-10 mag-10 set-10



#### **Defects on rolls**





Figura 1. Esempio di puntinatura nera



Figura 2 Esempio di puntinatura nera a sinistra e flussata nera a destra







### **Defects on trays**



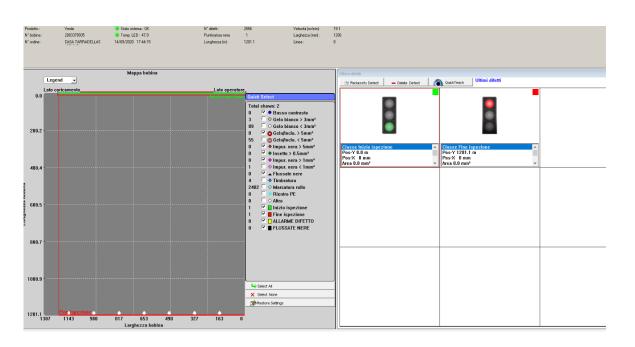




**Packaging & Recycling** 

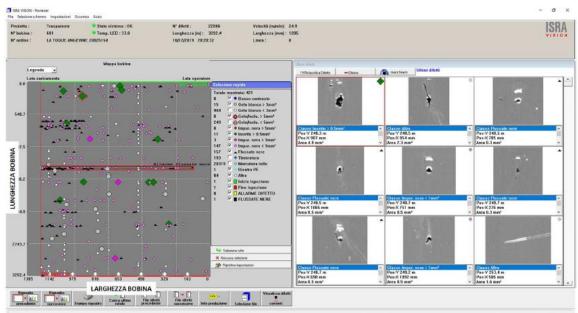








# Inspection camera PET virgin



# Inspection camera PCF







## Recyclable?









## Functions of packaging

**Contain** 

**Preserve and Protect** 

**Inform** 

Marketing









# Benefits of Modified Atmosphere Packaging

Longer shelf life / higher quality

More sales opportunities

**Fewer preservatives** 

Less waste

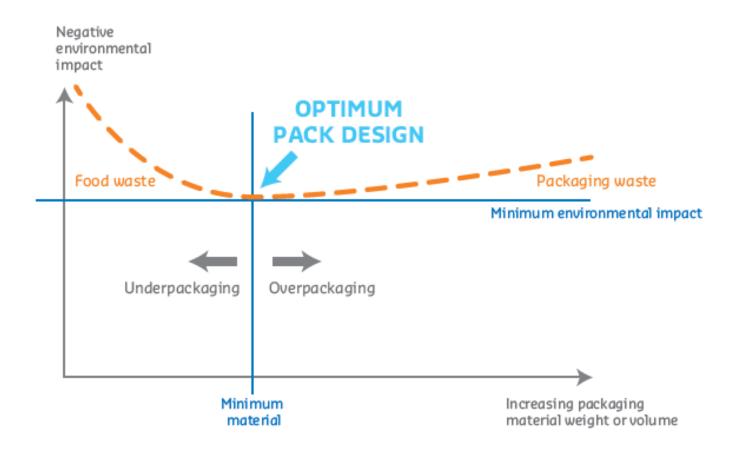






### Optimum pack design









Source: Eval Europe

# Some types of structures available in the market

#### Flexible (lids or flowpack)

OPET/PE, OPET/PE/EVOH/PE, OPETmet/PE, OPETmet/PE/EVOH/PE, OPET Pvdc, OPP, OPP/PE, OPP/PE/EVOH/PE, cPP, OPP/cPP, PP/EVOH/PP, PP/EVOH/PE, PA/PE, PE/PA/PE, PA/EVOH/PA/PE, PE, PE/EVOH/PE, PE/PA/EVOH/PA/PE, OPA/PE, OPA/PE, OPA/PE, OPET/Alu/PE, Paper/PE, Paper/PP, ..., ...

#### Rigid or semi-rigid (thermoformed trays)

APET, APET/PE, APET/PE/EVOH/PE, APETmet/PE, APET/PEmet, APETmet/PE/EVOH/PE, APET/PP, PP, PP/PE, PP/EVOH/PP, PP/EVOH/PE, PS/PE, PS/EVOH/PE, PA/PE, PVC/PE, PVC/PE/EVOH/PE, ..., ...

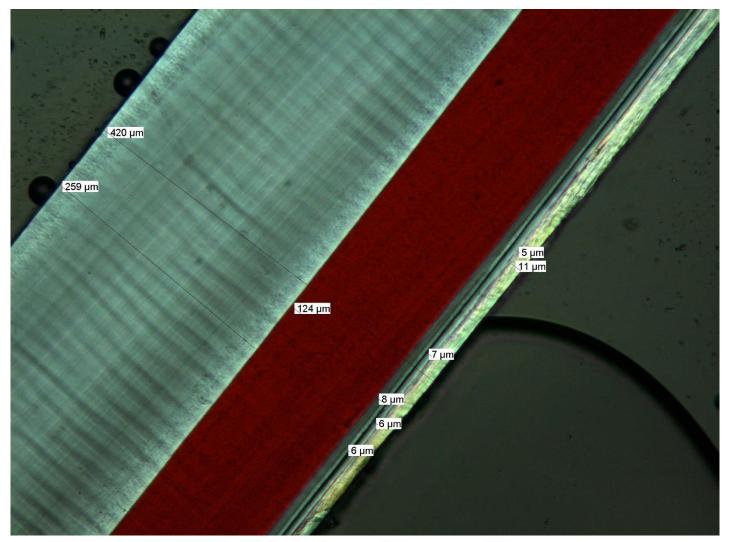


















# Why APET in food packaging applications plast

Clarity compearable with glass

Barrier for oxygen and other gases

Very good impact strength and thermoformability

**Good printability** 

Easy to recycle/reprocess

**Price competitive versus PS** 









#### Packaging polymer properties

Material	PET	PE - PP	PS	PVC	EVOH
CO2 Barrier	Good	Poor	Poor	Slight	Very good
O2 Barrier	Good	Poor	Poor	Slight	Very good
Water vapour barrier	Good	Very good	Slight	Good	Poor
Clarity	Very good	Slight	Good	Very Good	Good
Pasteurisation	Very good	Very good	Good	Good	Very good
Thermoformability	Very good	Good	Good	Very good	Very good
Impact strength	Very good	Slight	Slight	Good	Slight
Sealability	Slight	Very good	Poor	Poor	







PE layer strengthens sealing properties

PE layer improves sealing speed on FFS machines

PE layer multiplies peeling options

PE layer extends barrier properties through EVOH or PA coextrusion

PE layer adds water vapour barrier

PE layer gives extra decoration possibility (printing, metalization, ...)

PE layer widens additivation options (antifog, antibacteria, active barrier, UV absorption reclosable).)

PE layer increases package's resistance and safety of the goods packed





mono-material plastic packaging.

It believes that dried foods, pet food and non-food sectors such as detergents are the most likely sectors to shift from multi-layer and multi-material to mono-material options during the forecast period.

Nevertheless, while mono-materials will continue to grab market share from multi-material packaging film for some low- to medium-barrier pouch applications, Smithers said it is likely to be "extremely challenging" for them to displace a significant volume because of a number of property limitations. These include lower mechanical properties such as sealing strength and lower barrier properties, which must be overcome if mono-materials are to compete successfully against their multi-layer counterparts.

While taking the lion's share of the flexible packaging films market, multi-layer materials are nonetheless difficult to recycle because of the need to separate the different layers and the incompatibility of some of the resins in the final recyclate.

Consequently, interest is growing, particularly in Europe and North America, in using mono-material films because they are fully recyclable. Smithers cites a major trend towards all-PE structures as many brand owners

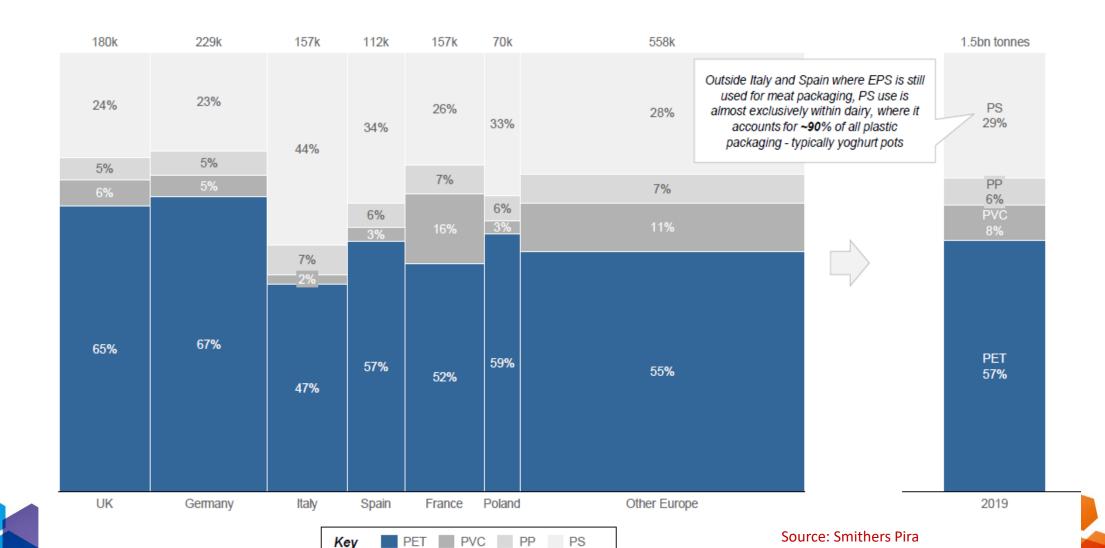
Source: Smithers Pira







# European market for rigid films in food packaging plast





### Challenges/Opportunities?



#### **RECYCLED**

- Technical
- Economic

#### **RECYCLABLE**

- Technical
- Economic

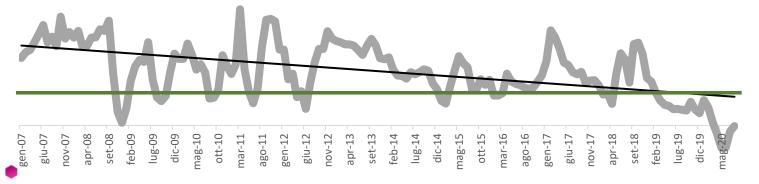




#### **PET and PCF €/ton**













# plast

## We cannot drive the change alone



