



Mixed plastics – European experiences and trends

Mariagiovanna Vetere



Mixed Plastic WG

Key topics of mixed plastics WG action plan

- Analysis of the situation of Collecting Sorting and Recycling of Mixed Plastics packaging waste in order to find schemes that are cost effective
- Carry out studies on mechanical recycling to individuate cost effective applications, avoid landfill, reduce incineration and find end market
- Evaluation of adequate indicators like Carbon Footprint or LCA to provide an efficient communication and support strategic decisions.

Definition

Mixed plastic packaging waste is a waste fraction deriving from separate collection and sorting including, but not limited to, blister packs, shrink wrap, food wrappers, food trays, tubs, pots, and other domestic non-bottle packaging. It should not include plastic bottles, crates or films bigger than a standard A4 sheet (210 × 297 mm).

Mixed plastics are more likely to be contaminated by other types of plastic, such as toys, coat hangers, plant pots, garden furniture.

Open question: what about film? Is it always the best solution to treat it as a separate fraction?

Situation in EU

Plastic packaging waste in Europe Collection

Separate collection of plastic packaging in some European countries:

Belgium and France - Collect only bottles (PET and PE)

Germany – Deposit on beverage packages; yellow bin for all plastic one way packaging, cans and beverage cartons.

Italy – Yellow bin, all plastic packaging, with or without metals up to each municipality.

Spain – Yellow bin, all plastic packaging, metals and beverage cartons.

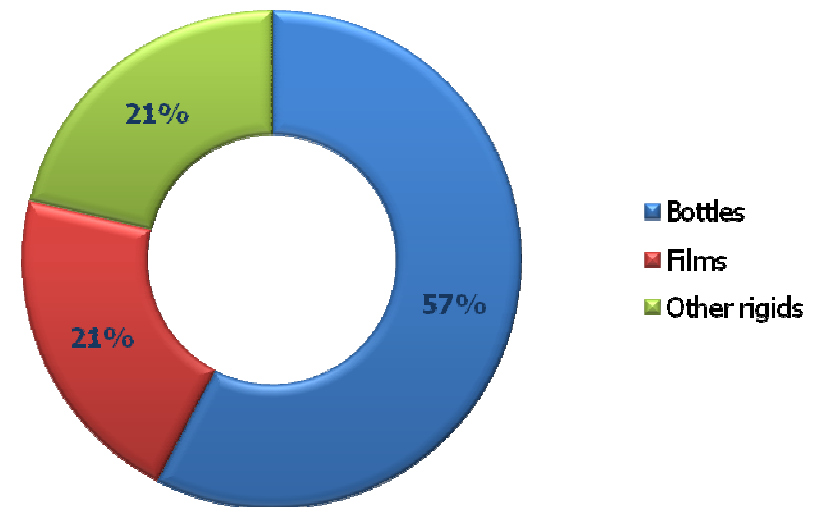
Switzerland – PET bottles only.

Yellow bin for all plastic packaging, metals and beverage cartons

Household plastic packaging put on the market for 2007 – **777** k ton.

Total Recycling in 2007 – **250** k ton

21% of total recycle are mixed plastics mainly PP and PE while the rest are Bottles PET and PE and film.



Figures for HH packaging only - 2007

Germany

Deposit on beverage packages + yellow bin for all plastic one way packaging

Estimations of HH figures in Germany in 2007
(source = Plastic Data Alliance)

Total generation of waste – **1.500** kT

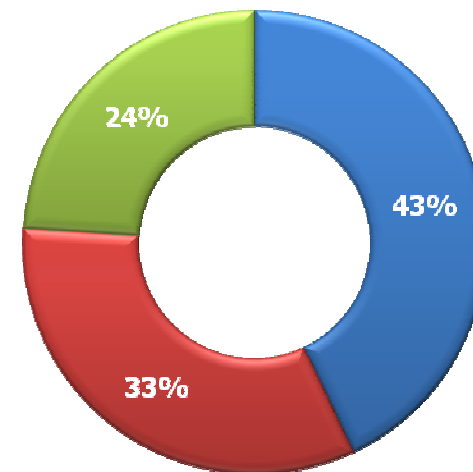
Total recycling one way **430** kT

About 250 kT of which are rigid plastics:

≈ 150 kT of pre-sorted rigid (PP,PE,PS..)

≈ 100 kT of mixed rigid

(some are recycled as such, others are separated by resins during recycling process)



■ PET Bottles ■ other rigids ■ films

Total recycle from deposit system of **320** kT PET bottles.

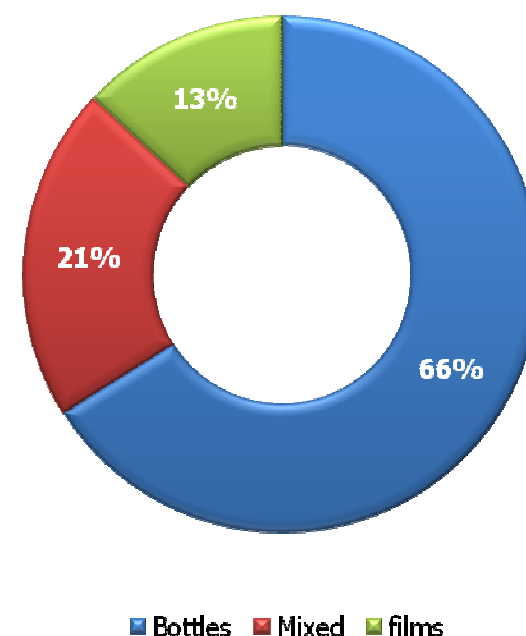
All plastic packaging and can be kerbside, door to door, etc.

Total Household plastic packaging put on the market for 2007 – **1.450** k ton

Total HH recycling – **280** k ton

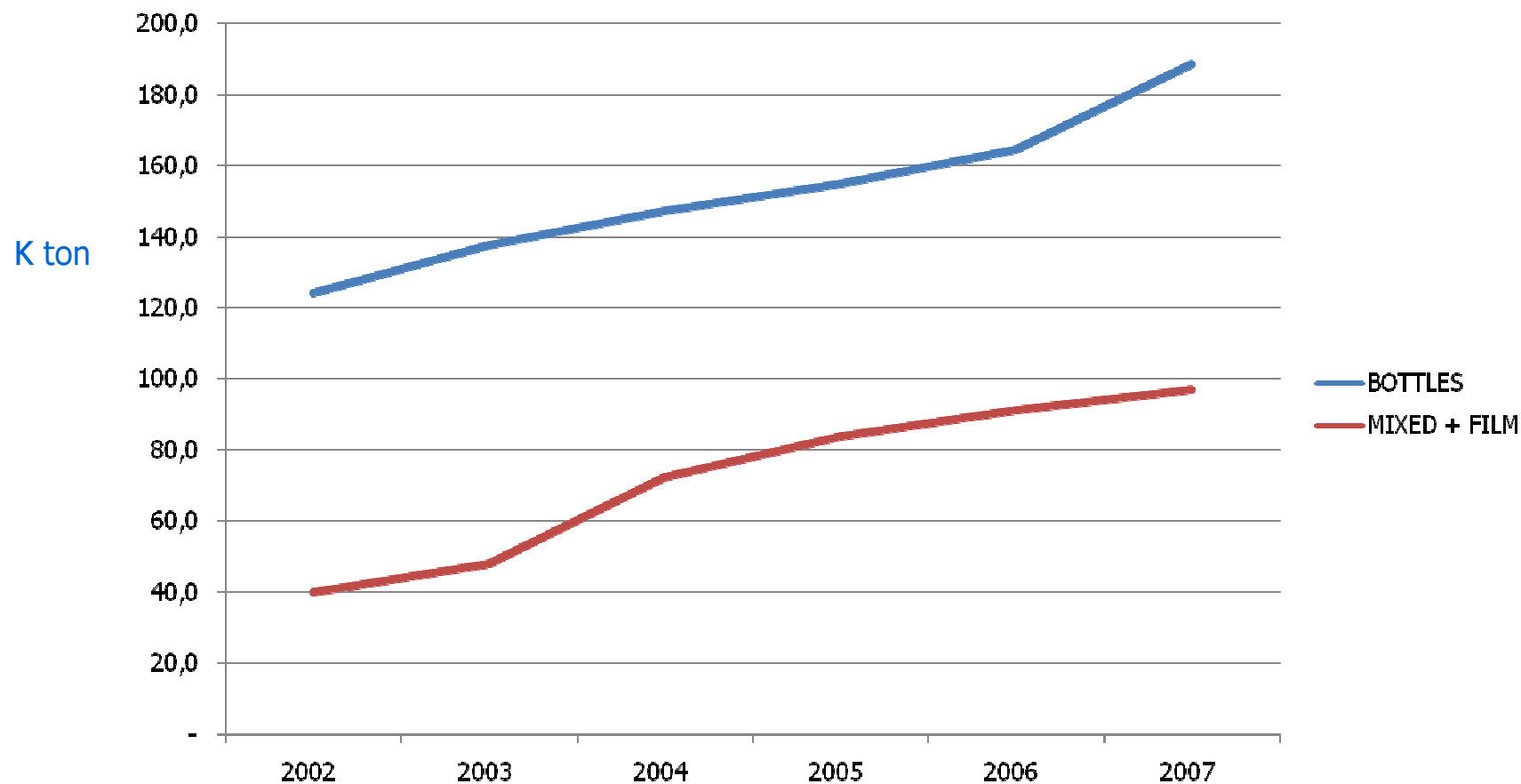
Mixed plastics and films are **34%** of total recycle

Mixed plastics with high content in polyolefin or PET.



Italy

Quantities recycled in 2007



- For 2008 recycling target is **30,5 %** and forecasts show that quantity of mixed plastics packaging collected will increase. Corepla is focused on create even more value for mixed plastics fractions through automatic sorting (for increased efficiency) and analyzing end use markets in order to find high-value applications.
- High value applications mean more value for fractions and reduce cost of recycling.

UK Recoup Projects

Question: "What is the best way to manage mixed plastic packaging waste in UK?"

The Trials

Real UK mixed plastics samples (tonne scale).

14 technologies -commercial scale.

Many widely used across Europe.

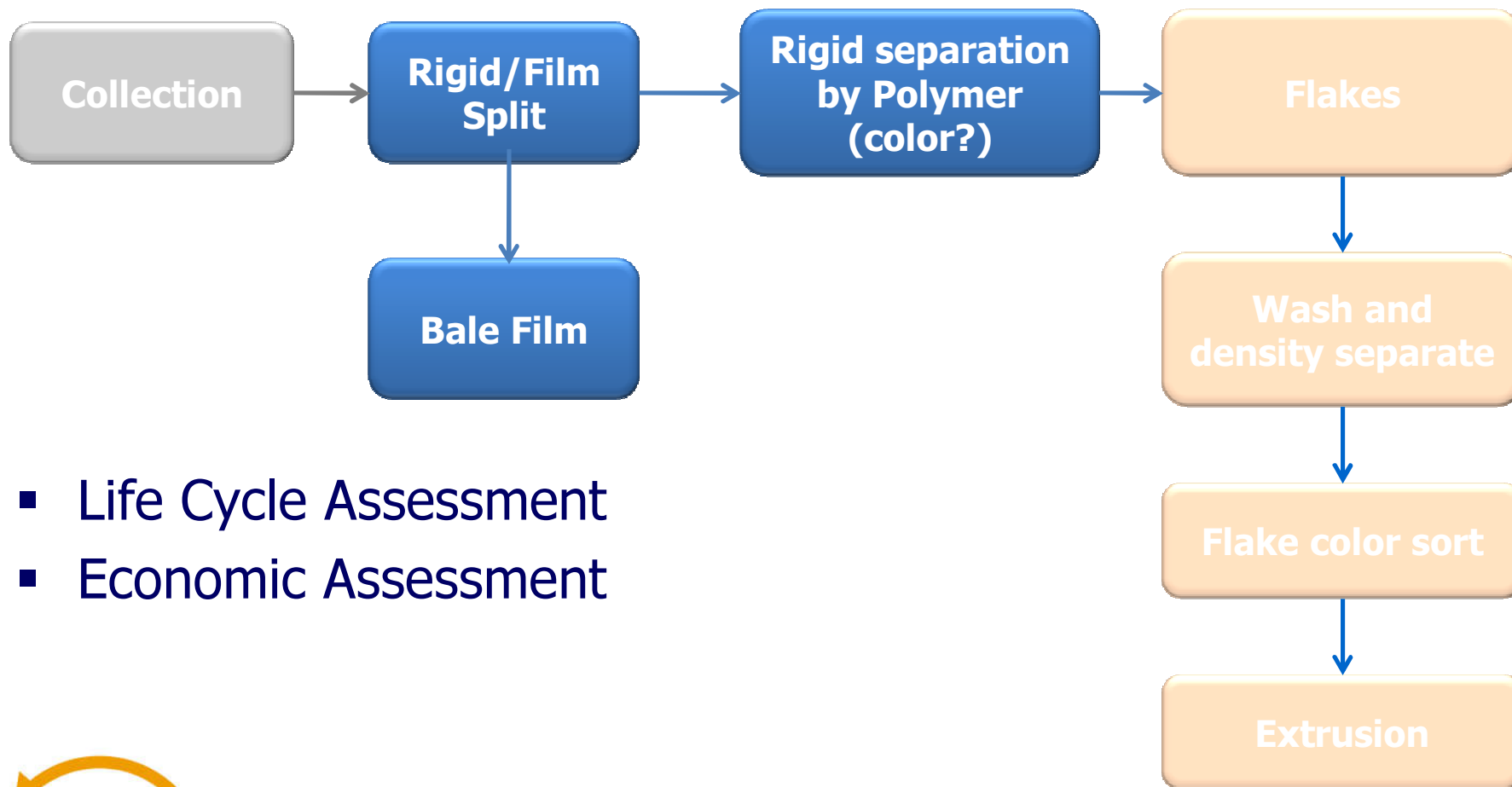
Several novel technologies.

Covering a wide range of processing including:

- ✓ Flexible and rigid separation.
- ✓ Near Infra Red (NIR) sorting of rigid.
- ✓ Float/sink flake sorting.
- ✓ Cleaning.

UK Recoup Projects

Possible Process



- Life Cycle Assessment
- Economic Assessment

UK development on Mixed Plastics Recycling

- Some recyclers already treating such streams (about 10 kT of Mixed Plastics recycled in 2007)
- WRAP tender call (July 08):
=> "Commercial Scale Mixed Plastics Recycling Trial"

France

Bottles– small quantities of films – R&D on Mixed Plastics

- 218 kT collected and recycled in 2007 (99% bottles)
- Mixed Rigid Plastics: market of about 200 k ton of packages potentially recyclable (mainly PP, PET and PVC)

Could this stream be sorted in almost every 300 sorting plants?

- Large plants might be able to start sorting out PS, PP..
- Small plants will have to put all rigid together
- Specifications / sorting instructions ?
- Positive value for bales ?

⇒ **15 month trials through an ADEME funded project**

SéRéPlast project (ADEME, PLF, VALORPLAST)

- September 2008 -> December 2010
- 3 phases:
 - Study of the stream + benchmark optical sorting
 - Pilot runs of loads from manual sorting plants
 - => preparation of streams of PP, PET, PVC and PS
 - Benchmark and test available recycling technologies (washing/cleaning, post-grinding separation)
 - => Assess economics and environmental impact of the whole Sorting/Recycling process.

EPRO WG activities and plans

- Input needs to be sorted to high level of purity per plastic type
- Recyclate needs to replace virgin polymer in the next application
- Well defined end markets for each recyclate stream need to be developed
- Only part of the input stream can be turned into recyclate with the balance better used for energy recovery. Percentages depend on quality and consistency of input stream

(The Compelling Facts About Plastics - 2008)

Next steps:

- Find potential outlets for new recyclate from PET trays, PVC blisters, PS pots...

Mixed Plastics TWG

Cicloplast – Spain
Corepla – Italy
DKR – Germany
Emballasjeretur – Norway
Pakendiringlus – Estonia
Plarebel – Belgium
PRS – Switzerland
Recoup – UK
Valorplast – France

Contact us at vetere@corepla.it

Visit our website www.euro-plasticsrecycling.org