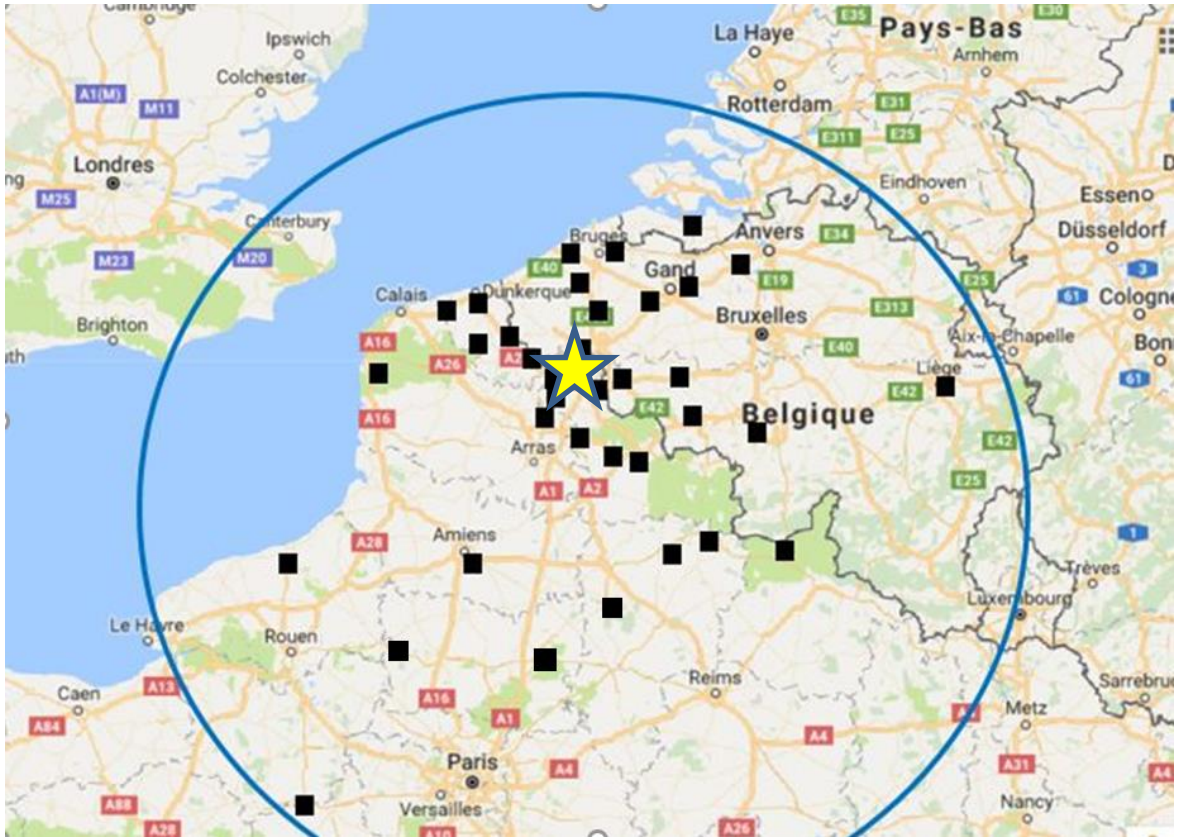
Challenges and opportunities of the new plastics economy

Olivier FRANCOIS

February 2, 2022

Galloo plants location



2020

44 plants

- 14 in Belgium
- 27 in France
- 3 in the Netherlands

Menen-Halluin plant : flagship of the group ★

Galloo : Halluin-Menen plant, France-Belgium border

History

1939	Foundation of the company by Joseph Galloo in Menen (B)
1976	First shredder plant
1982	First heavy media plant
1993	Chlorinated rubber density separation
1996	Experimental plant for plastics recycling
2000	Galloo Plastics plant in Halluin (F)

Key figures

- Turnover: € 500,000,000
- Staff: 720 people
  (+ 150 social economy)

- **INPUT** : focus ELV -> Shreds from 400 000 ELV/y

- **OUTPUT** :
- Ferrous metals: 1,250,000 tons
- Non-ferrous metals: 100,000 tons
- Plastics: PP, PS (PE, ABS) 50,000 tons

Geographic situation – Key figures

Geographic situation

GALLOO PLASTICS:

Halluin, North of France

° 1997

> 20 years experience in plastics separation and compounding for automotive industry

GALLOO PLASTICS:

Halluin, North of France

° 1997

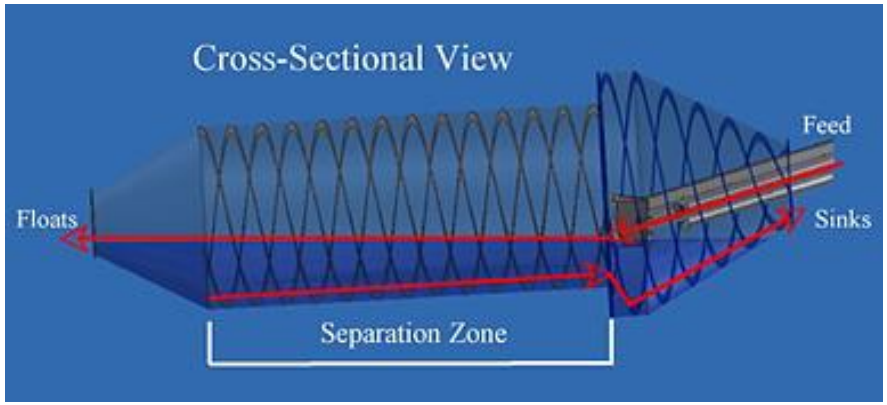
> 20 years experience in plastics separation and compounding for automotive industry

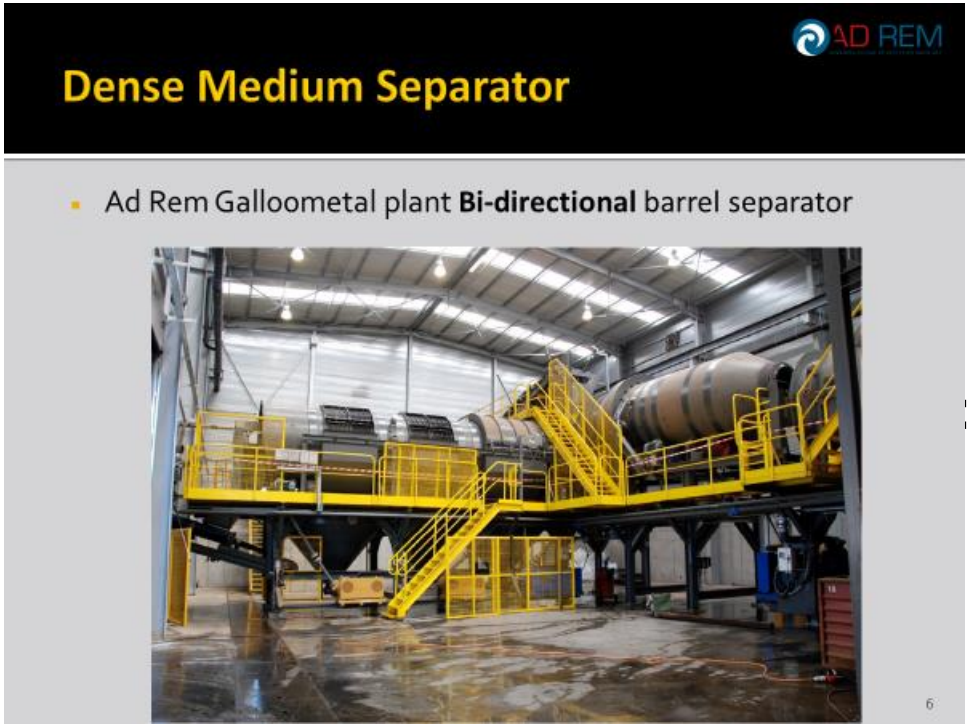
- Technical milestones

Heavy media plant
Density separation

Galloo key technology

Research started in the 80's



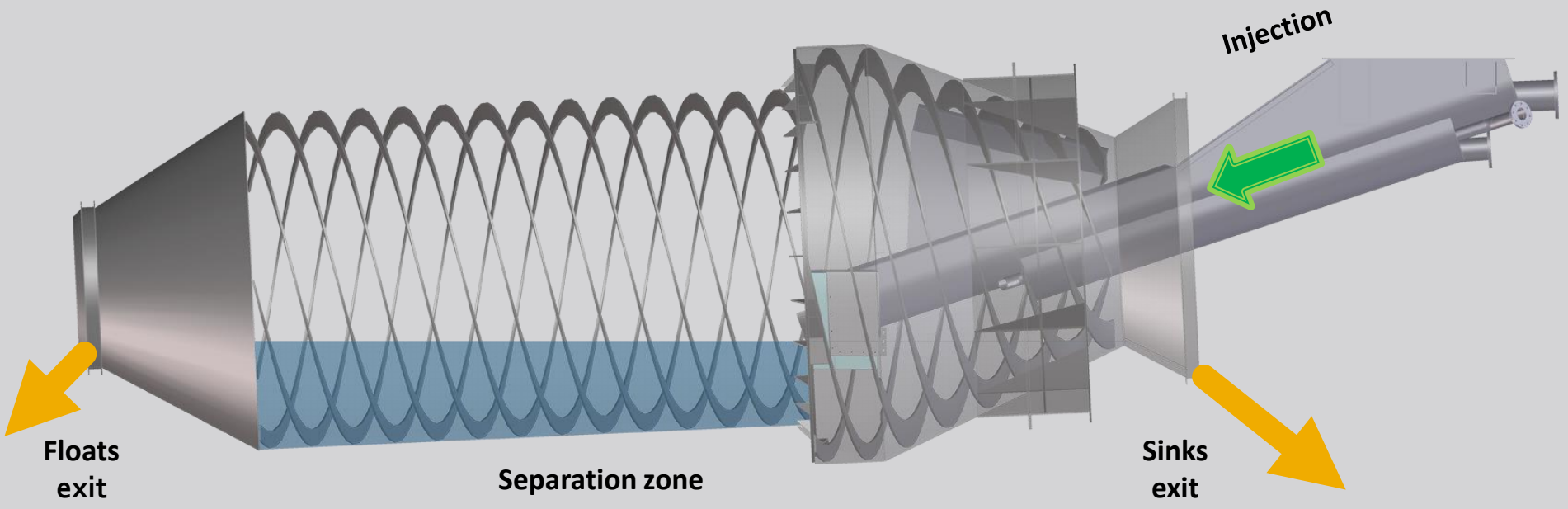


How does it work?

- **Bi-directional**

International patent

The medium is injected together with solids over a large separation zone, making it almost impossible to bury floats with sinks. The parts lighter then the medium float and are ejected on the front side of the drum. Heavier parts sink and are transported by an internal screw to the back of the drum.



- Technical milestones

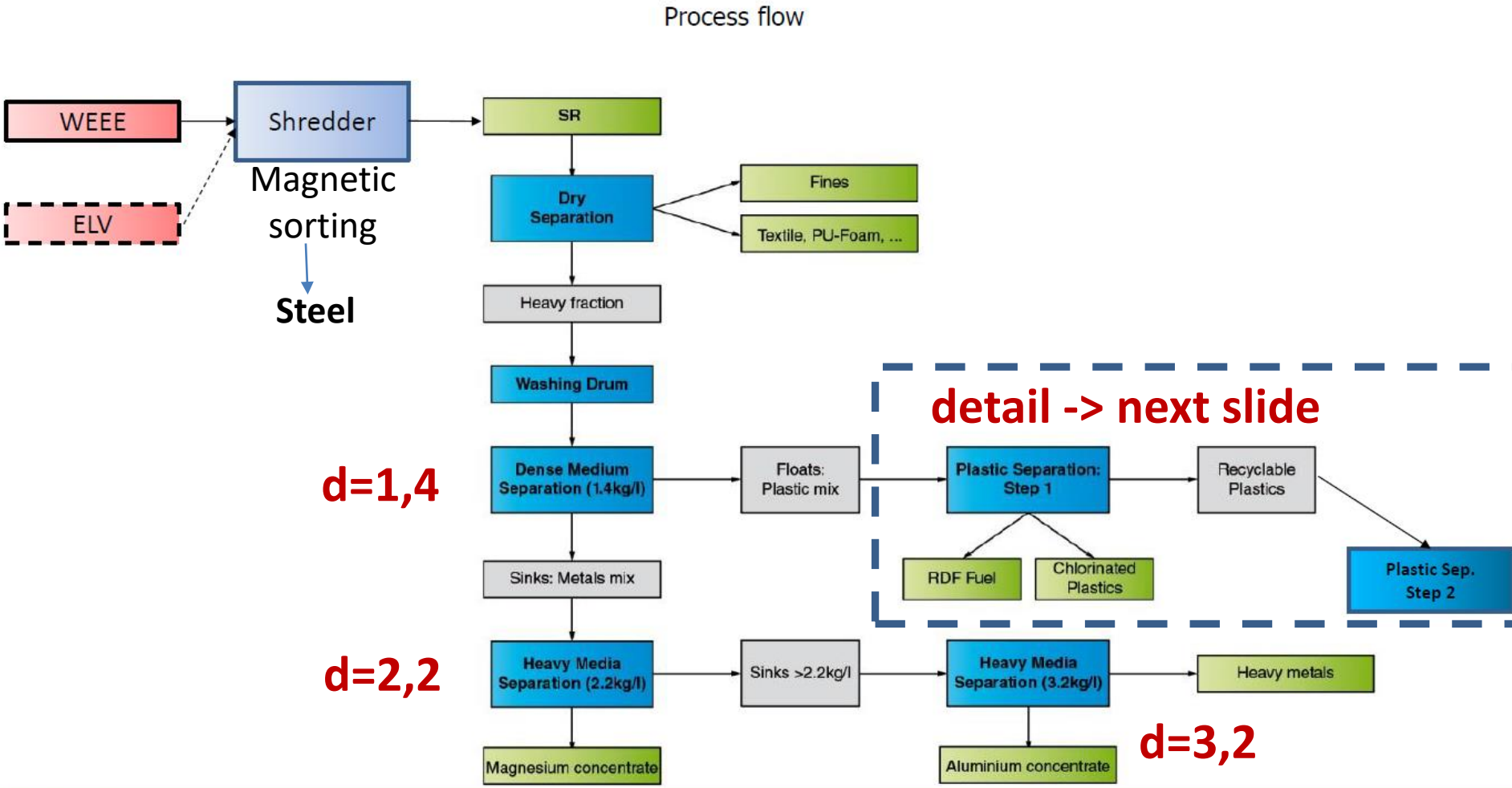
Dense Medium Separator

- **Bi-directional** barrel separator :

An horizontal rotating tank for a large production density separation : typically 30 tons/hour input

- Technical milestones

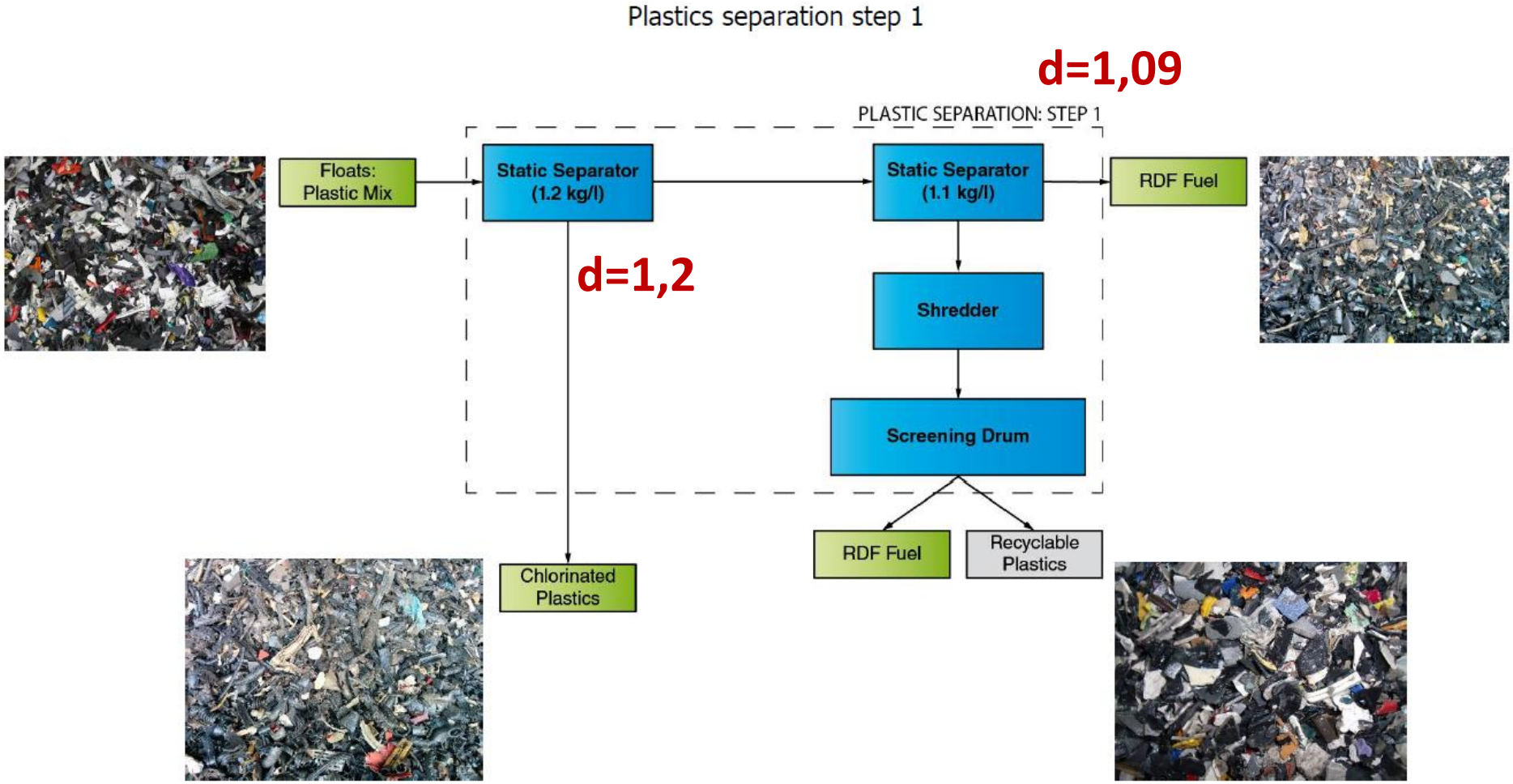
Density separation : since 2000 : plastics separation



- Technical milestones

Density separation : since 2000 : plastics separation

Plastics separation step 1



- Technical milestones

Plant tour … : here the "V" shaped tank for bidirectional "still" density sorting

Plant tour : general view

Plant tour : general view

- Technical milestones

Plant tour : another "V" shape tank

At this level 2 of them are necessary :
Density 1,2
Density 1,09

Plan tour : the case of the wood fraction
Infrared sorting…

- Technical milestones

Plant tour : the case of the wood fraction
Infrared sorting… 8 tons/hour non-metallic fraction input

Wood fraction output ->

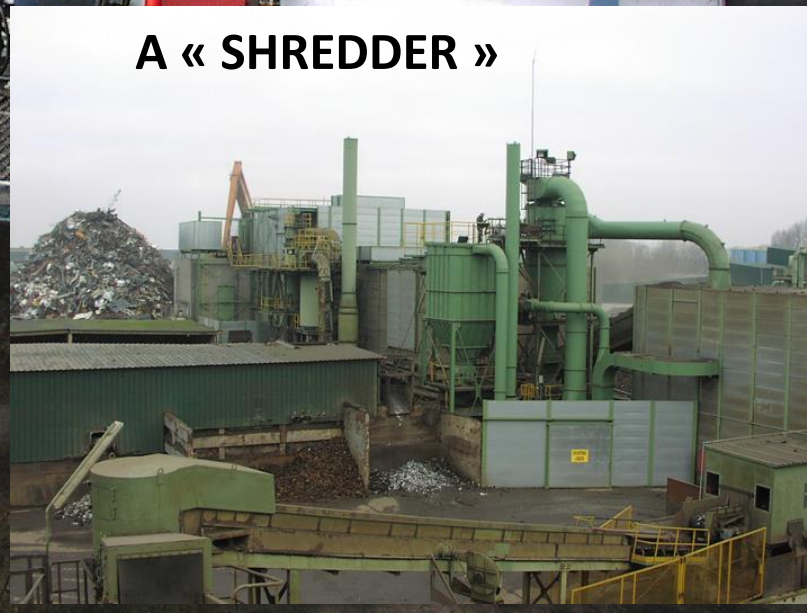
Plastic recycling : the many steps to go from waste to the product

How quality recycled plastics look like ?

A case study from car recycling

Depolluted vehicle : ready to be shredded

A « SHREDDER »



First processing operation : magnetic sorting

After Shredding and magnetic sorting :
Photo of « heavy fraction »: Mix of non-ferrous fraction and non-metallic fraction (plastics, rubber, wood, glass…).

During shredding, with air separation, the «light fraction» Mix of foam and textiles, has already been removed

Non-metallic car shredded fraction (photo) :

The «heavy fraction» is further sorted by eddy-current separators and/or density separation, into the non-ferrous metal fraction and a Mix of plastics, rubber, and some wood

DENSITY SEPARATION PROCESS

Second processing operation

Photo of Plastic concentrate sorted from Mix of plastics, rubber, and some wood:

The result is a Mix of polymers to be sorted by polymer type Traces of rubber and wood are still in it.

Glass is totally removed

NON-metallic fraction sorting

Third processing operation

Pure PP

Polymer flakes :

PP polymer is further processed from the previous mix of polyolefins and polystyrenics. Further purification is taking place in this process

Fourth processing operation

PP flakes are mixed with master batches and/or additives and melted in a screw extruder (small photo) :

a compounded and filtered polymer ready to be used in new plastic parts

EXTRUSION AND FILTRATION

Fifth processing operation

Permanent Quality control of the compound to match consummer demand : Mechanical properties are key, because plastic is used for its mechanical characteristics

Subsequent manufacturing step:

100% PP compounded polymer used in vehicle shock absorber (component of car bumper) :

Produced by auto parts manufacturer

5 different recycling operations to go from a car to the ready-to-use polymers

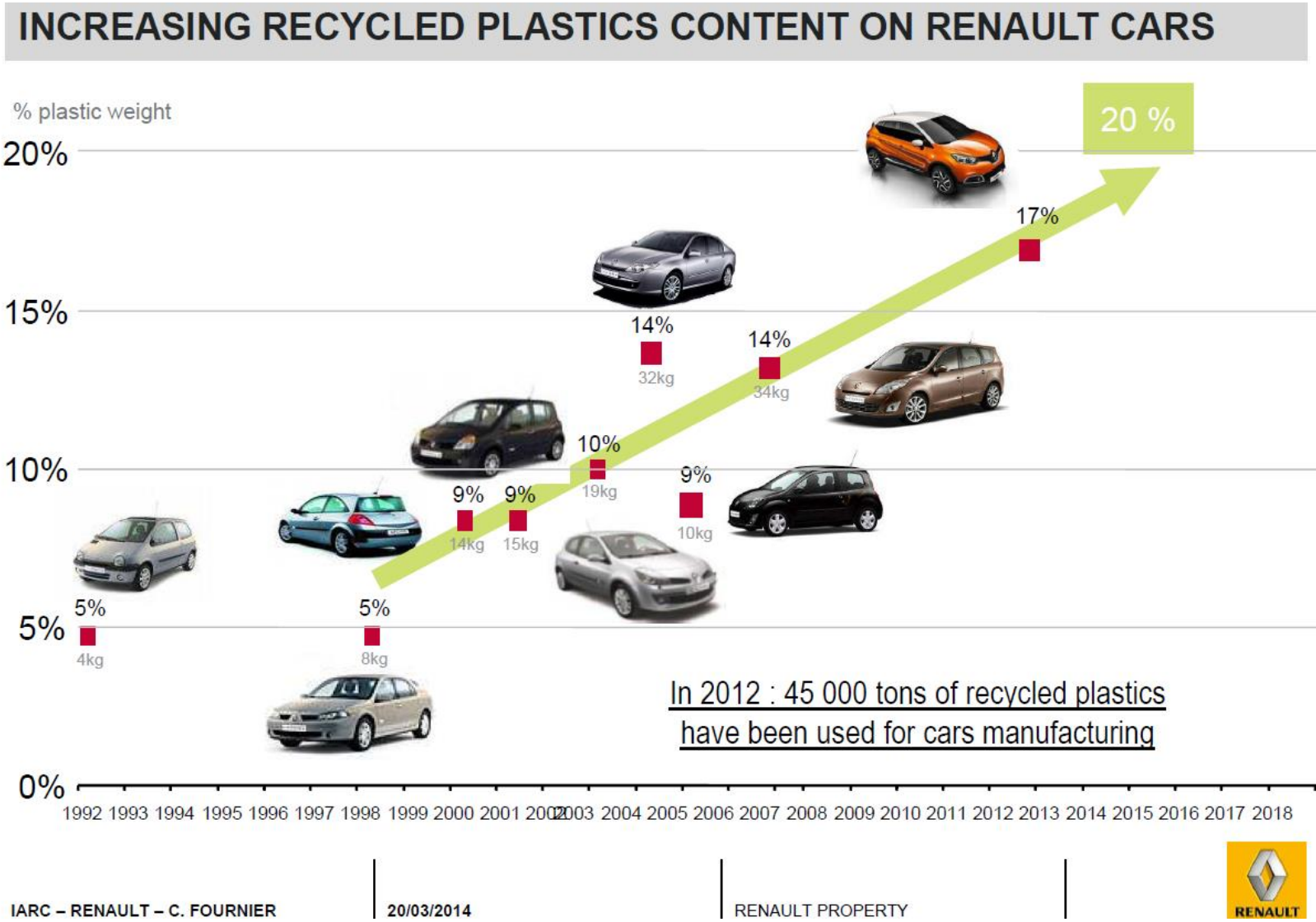
Renault challenge (90's) : quality and price

03 Intégration des plastiques recyclés : une réalité

De nombreuses pièces d'ores et déjà validées en plastique recyclé

Nouvel Espace :
53 kg de plastique recyclé

Renault challenge (90's) : quality and price



Conclusion :

- The car manufacturers are already at the level of 50kg post-consumer recycled plastics in new cars
- It means we can achieve the regular existing plastics **quality standard** (mechanical properties)
- The recycling of plastics is not something “to do”: it is in place for many years and proven
- We must continue to fight for mandatory **incorporation rates** in new objects, like vehicles or electric appliances… this is EuRIC main priority !

Galloo Plastics

Challenges and opportunities of the new plastics economy

Olivier FRANCOIS

THANK YOU !

February 2, 2022