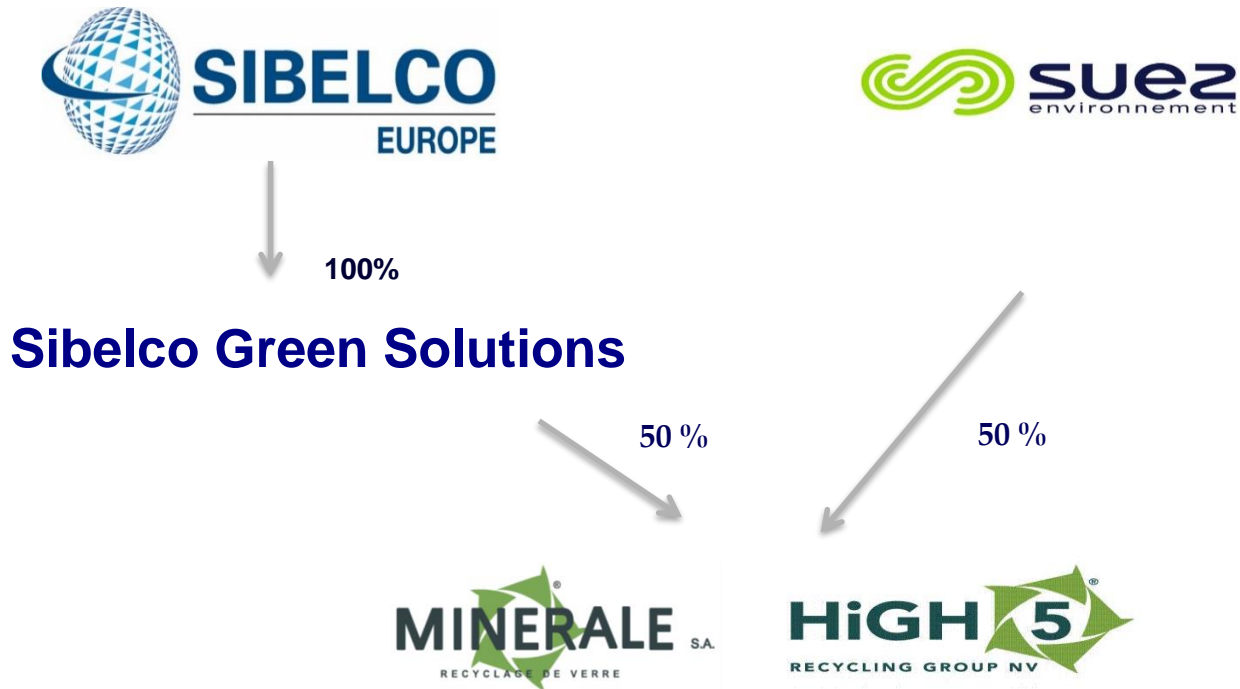




Glass Recycling in Belgium

A Joint Venture 50/50 between SIBELCO and SUEZ



Unique partnership combining SUEZ Waste Collection expertise with SIBELCO state of the art recycling technology.

SIBELCO PROFILE : *A leading force in industrial minerals*

Truly global and diversified industrial minerals company.

- Family owned business with 140 years of experience.
- Global company – 210 operations in 41 countries, spread over 5 continents.
- Lean and flexible organization - more than 10.000 employees worldwide.
- One of only 2 truly diversified industrial minerals groups.
- Leadership position - globally in silica, HPQ, ball clay, nepheline and olivine ; regionally in frac sand, lime and limestone...
- Long term perspective on value-creating growth and diversification.



Suez Environnement : A worldwide reference

- ✓ 25 MT of Waste collected
- ✓ 33 MT of waste treated
- ✓ 7 MT of raw materials produced
- ✓ 6M GWh of energy generated from a waste



3 WASTE RECOVERY SOLUTIONS

RECOVERY OF **REUSABLE MATERIALS**

OR RECYCLING,
TO MAKE NEW
PRODUCTS



RECOVERY OF **BIOLOGICAL WASTE**

TO MAKE
COMPOST
OR FERTILIZER



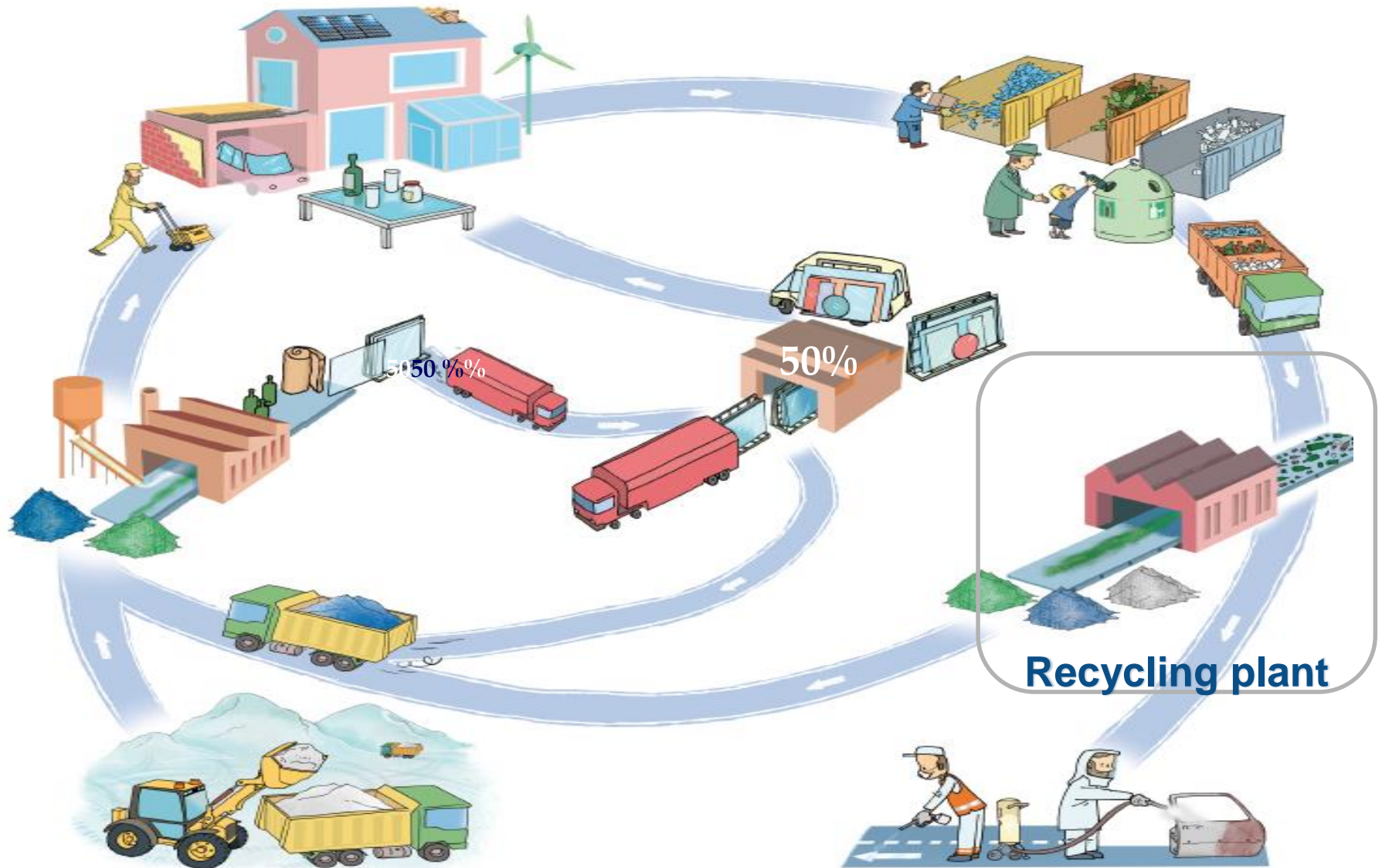
RECOVERY OF **ENERGY**

TO PRODUCE
ELECTRICITY
OR HAT



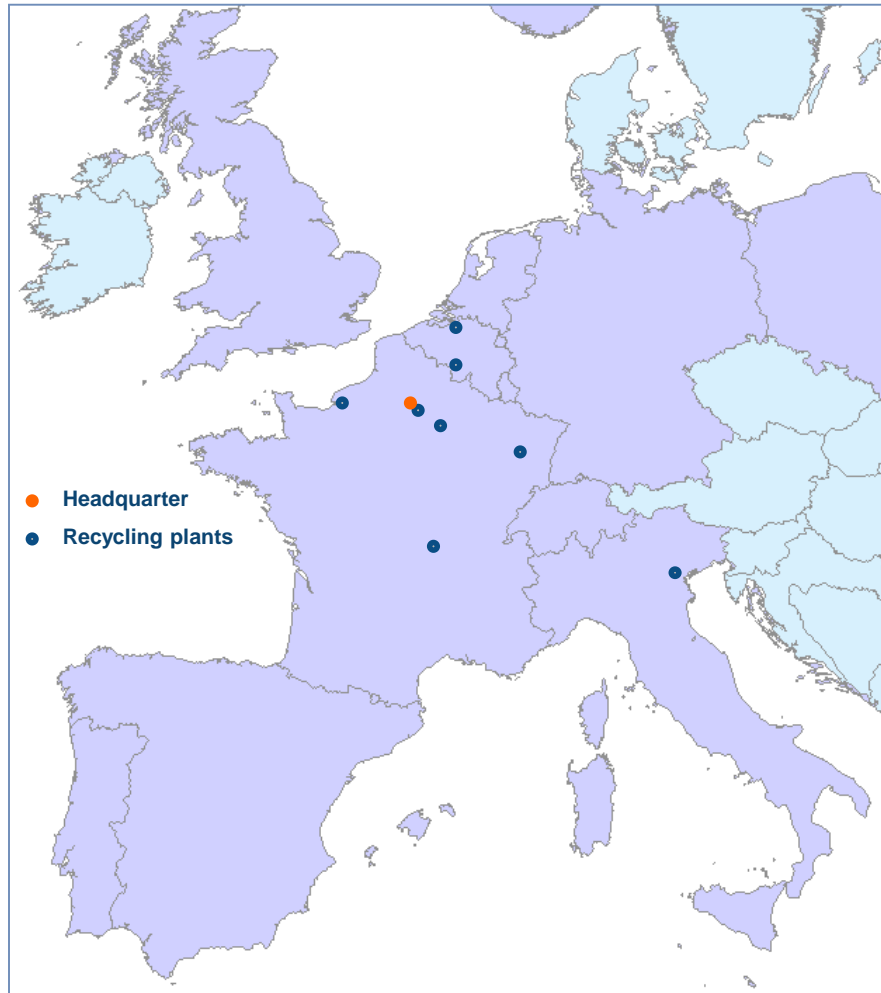
European Platform

The glass cycle : a perfect example of the Circular Economy



Sibelco Green Solutions Key figures

A dense network of recycling plants

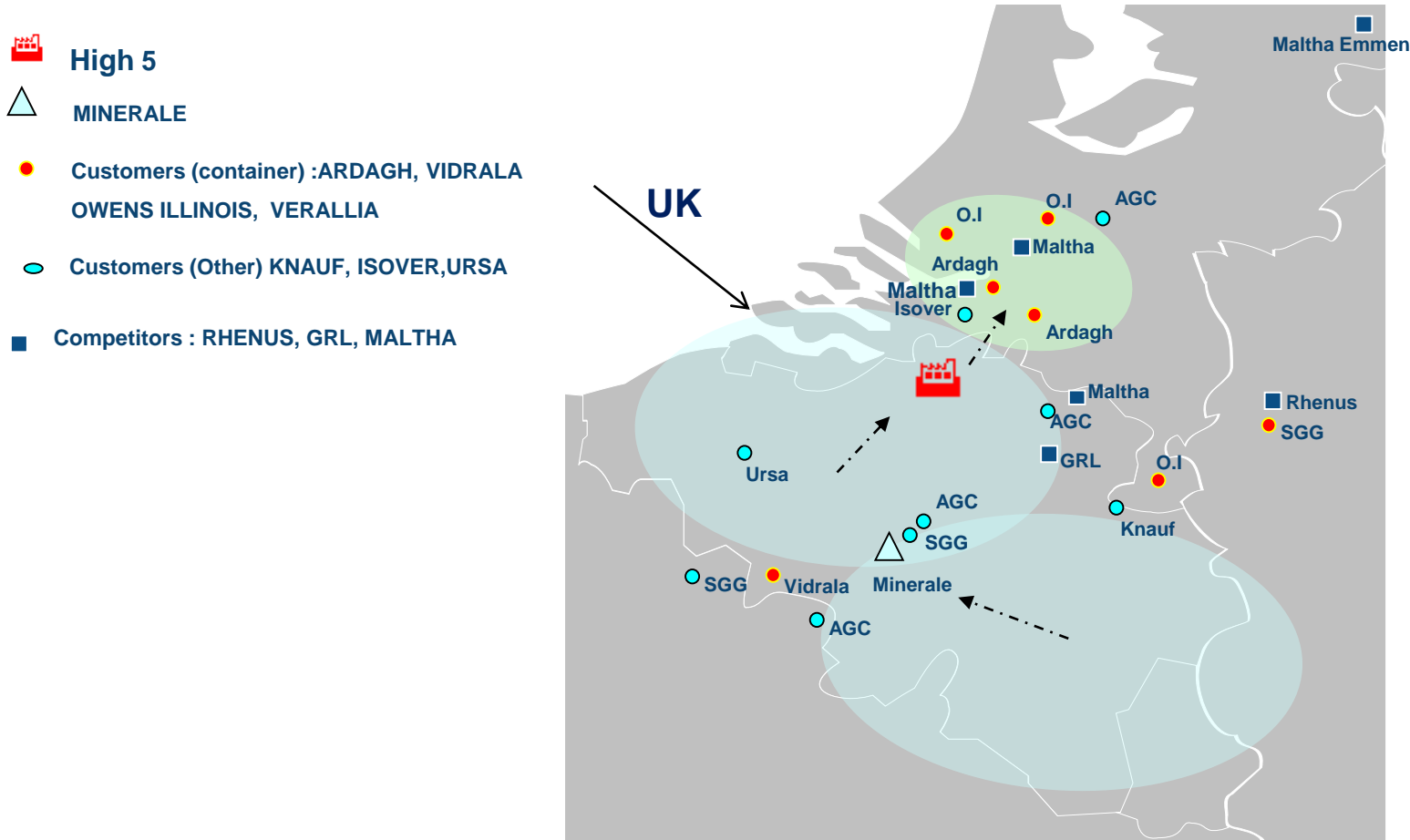


- **180 employees**
- **Production: 1,3 Million T/y of cullets**
- **8 production sites**
 - 5 in France : *Crouy, Reims, Saint Mene, Le Havre, Andrezieux*
 - 2 in Belgium (JV 50/50 with SITA): *Lodelinsart, Antwerp*
 - 1 in Italy : *Musile*
- **Main competitors at European Level :**
 - RHENUS Recycling (Germany)
 - MALTHA (The Netherlands)

Strategy in Belgium - Market situation -

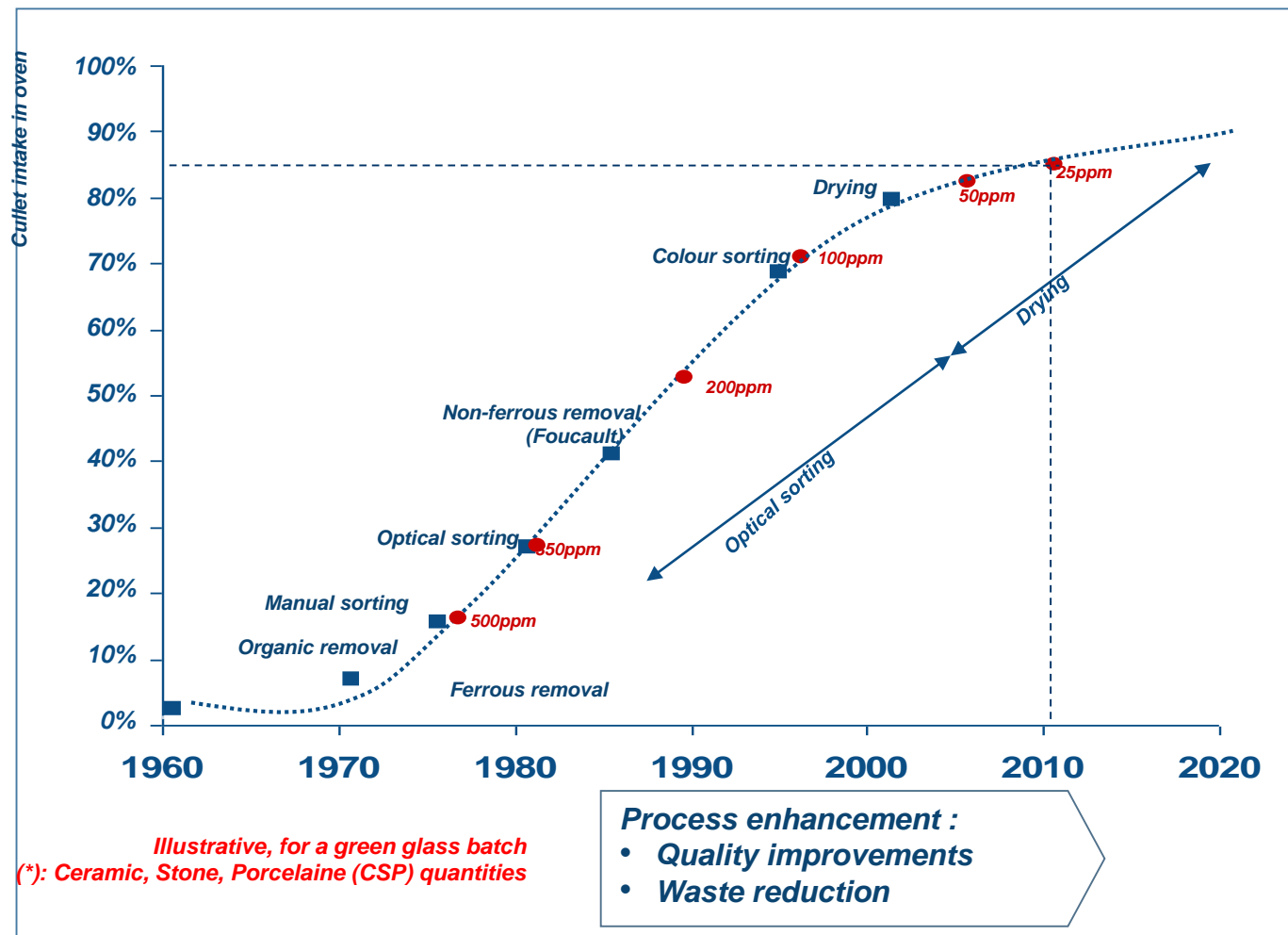
Large technological improvement associated with geographical optimization.

➤ Antwerp: 250 kT bottle glass; Charleroi : 120 kT bottle and flat glass



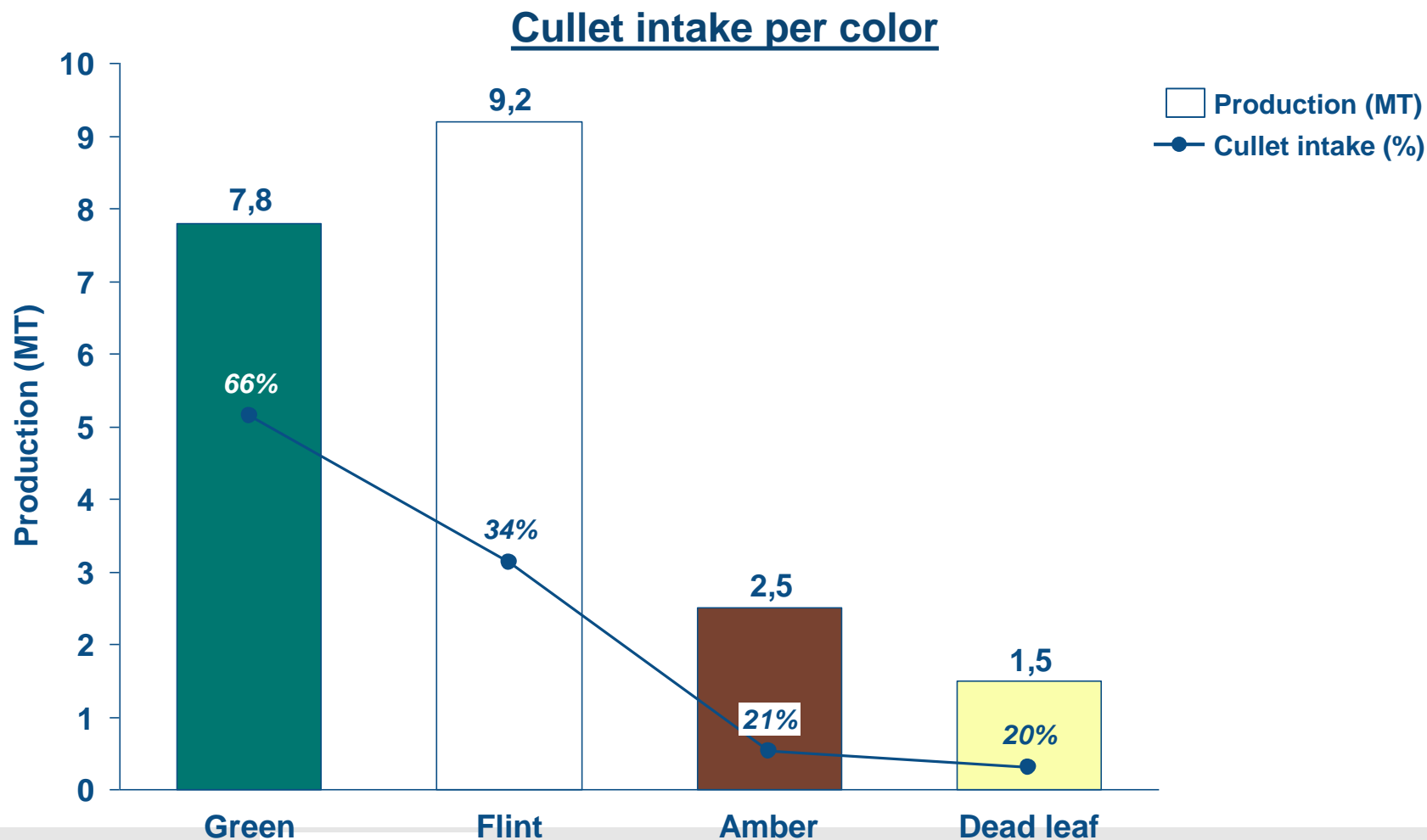
Container glass recycling – evolution of the process

Glass recycling capacities (11 MT in Europe) and technology step change allowed the production of furnace ready cullet for the glass industry.



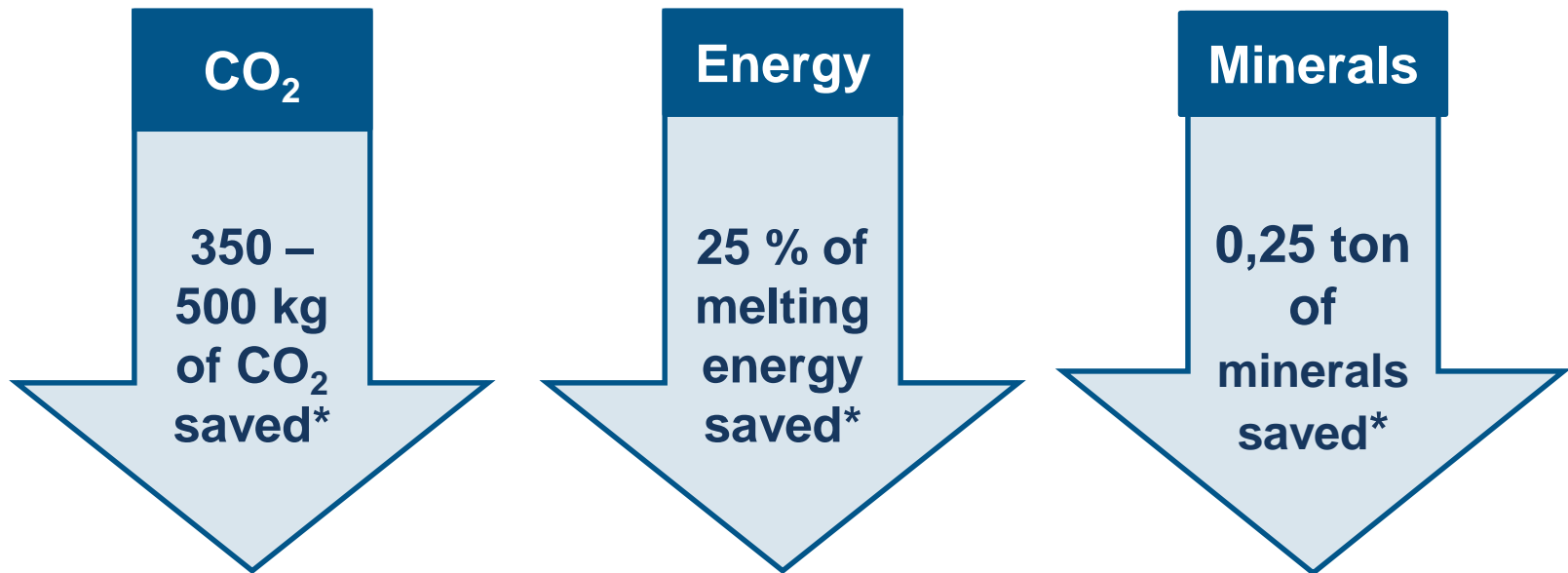
Container glass recycling - process

Color sorting technologies (developed in 2000) provide new room for additional glass recycling and help balance the input (glass collected) with the output (industry need).



Why are cullets so critical for the glass industry ?

- Environment and economic benefits
- Possibility to increase the pull of the furnace
- Increased life time of the furnace



* per ton of cullet

HIGH 5: a modern bottle glass recycling plant



**From a
Household
waste,**

**Make a product
for the glass
industry**
(End of waste)



HIGH 5: An answer to the glass industry

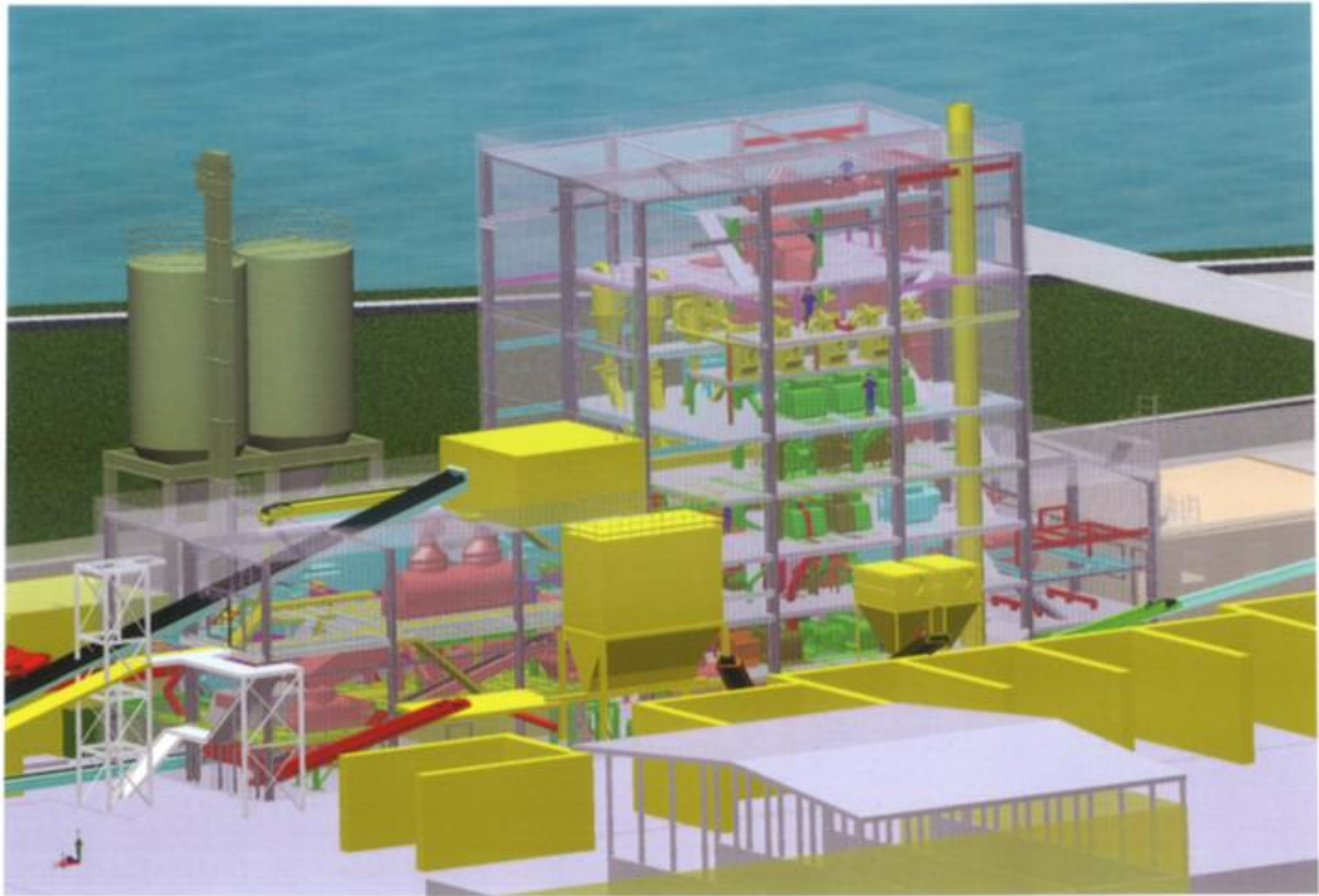
- A complete new bottle glass recycling plant with
 - Last modern equipment for glass sorting
 - Dried cullets
 - In the Harbour of Antwerp, possibility to handle sea ships
 - Start of production in october 2013
 - Production of 4 cullets qualities : (250 kT/year ; 50 T/h)



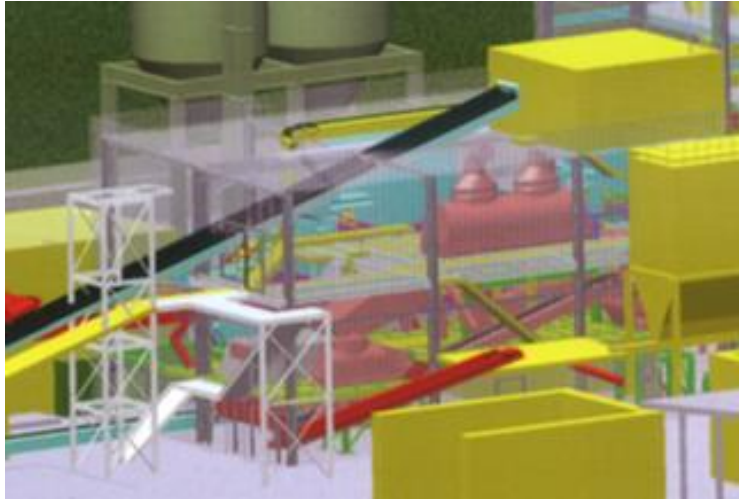
HIGH 5: a modern glass recycling plant



HIGH 5: Transparent view



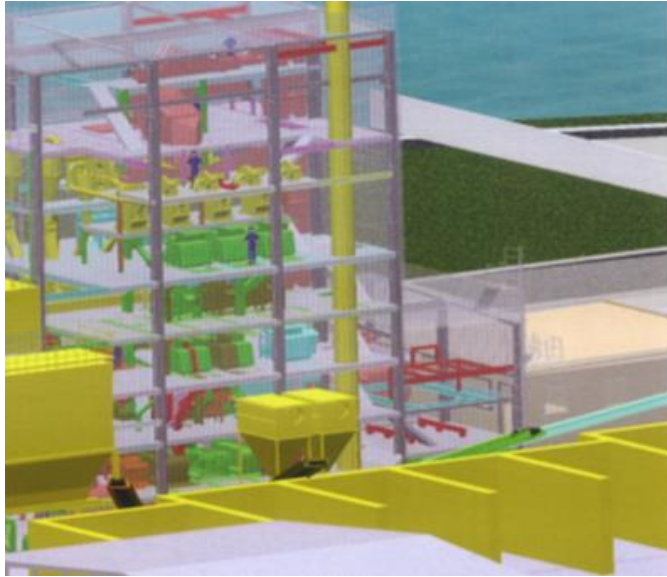
HIGH 5: Treatment : First steps



- Management of the different qualities of raw material
- Manual sorting of big pieces of waste before crusher
- Screening and calibration of the cullets
- Ferrous and non ferrous are removed
- Plastics, light fraction, corks are eliminated
- Drying of the cullets before optical sorting



HIGH 5: Final treatment : optical sorters

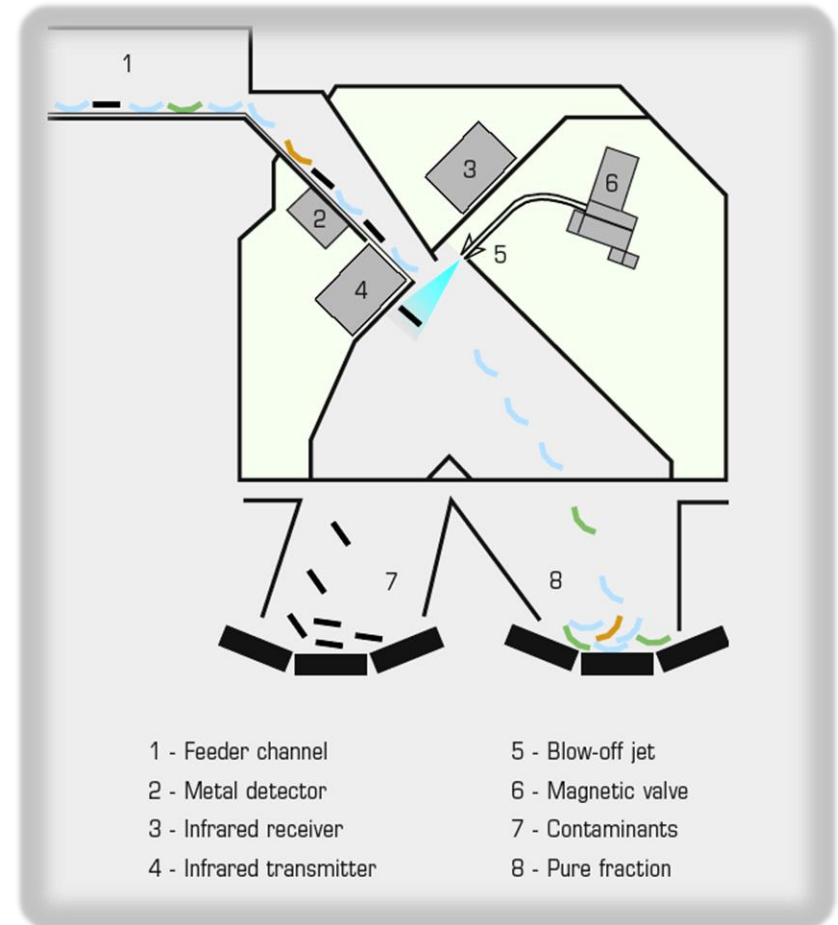


- Optical sorting:
- Cascades of optical machines, each one with his own job
- Optical machines : main part of the investment and heart of the process.
- Why optical sorting ?
- Remove residual contaminants (CSP, Crystal glass (Lead) , vitro-ceramic)
- Sorting the cullets in four colors : Flint, Green, Amber, Dead-Leaf
- Quality control

Some optical machines : the heart of the process



https://www.youtube.com/watch?v=NUSBrXkSU_g



The 4 colours and the other fractions



Flint



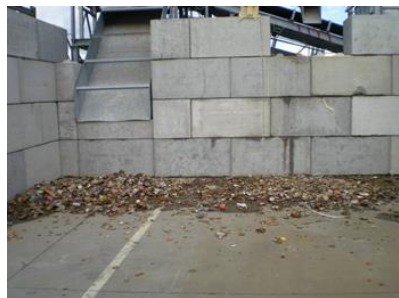
Green



Dead leaf



Amber



Ferro



Non ferro



KSP+Vitro



Waste CL 2







Présentation High 5 Recycling – Minérale s.a

