THE FUTURE OF GLASS IN FOOD AND BEVERAGE PACKAGING

JOURNÉES VERRE
NICE & BIOT 2022

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verallia

SUMMARY

verallia

A LEADER IN GLASS PACKAGING

Our international manufacturing and commercial presence allows us to maintain a close working relationship with our customers. We can offer our support designing, developing and supplying attractive, safe and sustainable glass packaging solutions that enhance their products and reduce their environmental impact.

200 YEARS OF HISTORY AND EXCELLENCE IN GLASS

1827
Vauxrot glassworks established in France

1918
Expansion overseas begins

1972
Saint-Gobain Packaging division established

2010
Creation of the Verallia brand

2015
Verallia becomes an independent Group

2019
Verallia listed on stock market

2020
Verallia defines its purpose

2021
Verallia launches its CSR* roadmap

2022
Changes in the Group's governance with the separation of the functions of Chairman of the Board of Directors and Chief Executive Officer

*Corporate Social Responsibility

KEY POSITIONS ALL OVER THE WORLD

11
countries

€2,7bn
turnover in 2021

+ de 16 Md
bottles and jars produced every year

10 000
employees

32
glass production sites

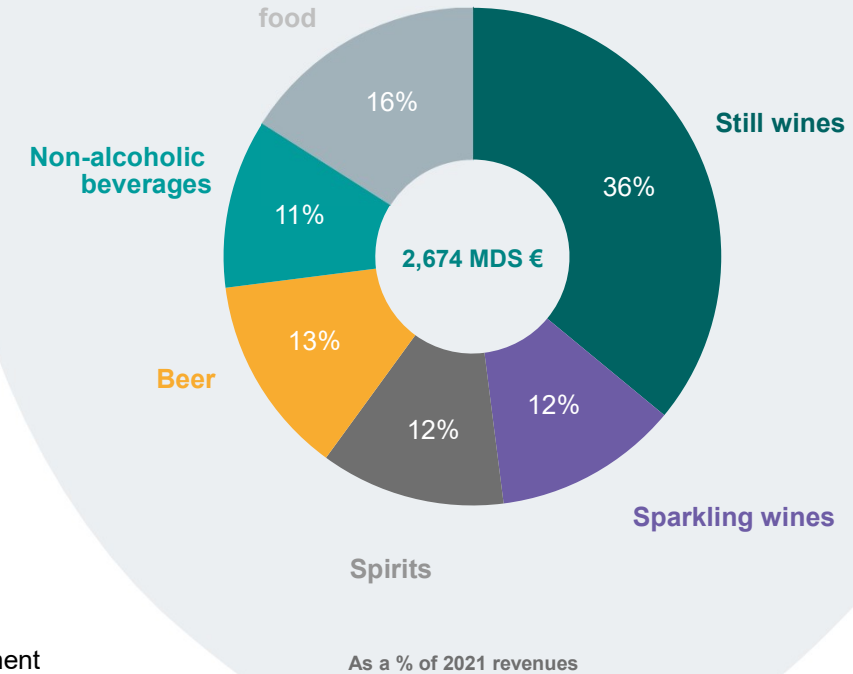
12
cullet Recycling Centers

58
furnaces

04
glass decoration sites

13
product development centers

Glass packaging sales breakdown by end-market (2021)



As a % of 2021 revenues

GLOBAL PRESENCE IN 3 MAJOR GEOGRAPHIC SEGMENTS

LATIN AMERICA

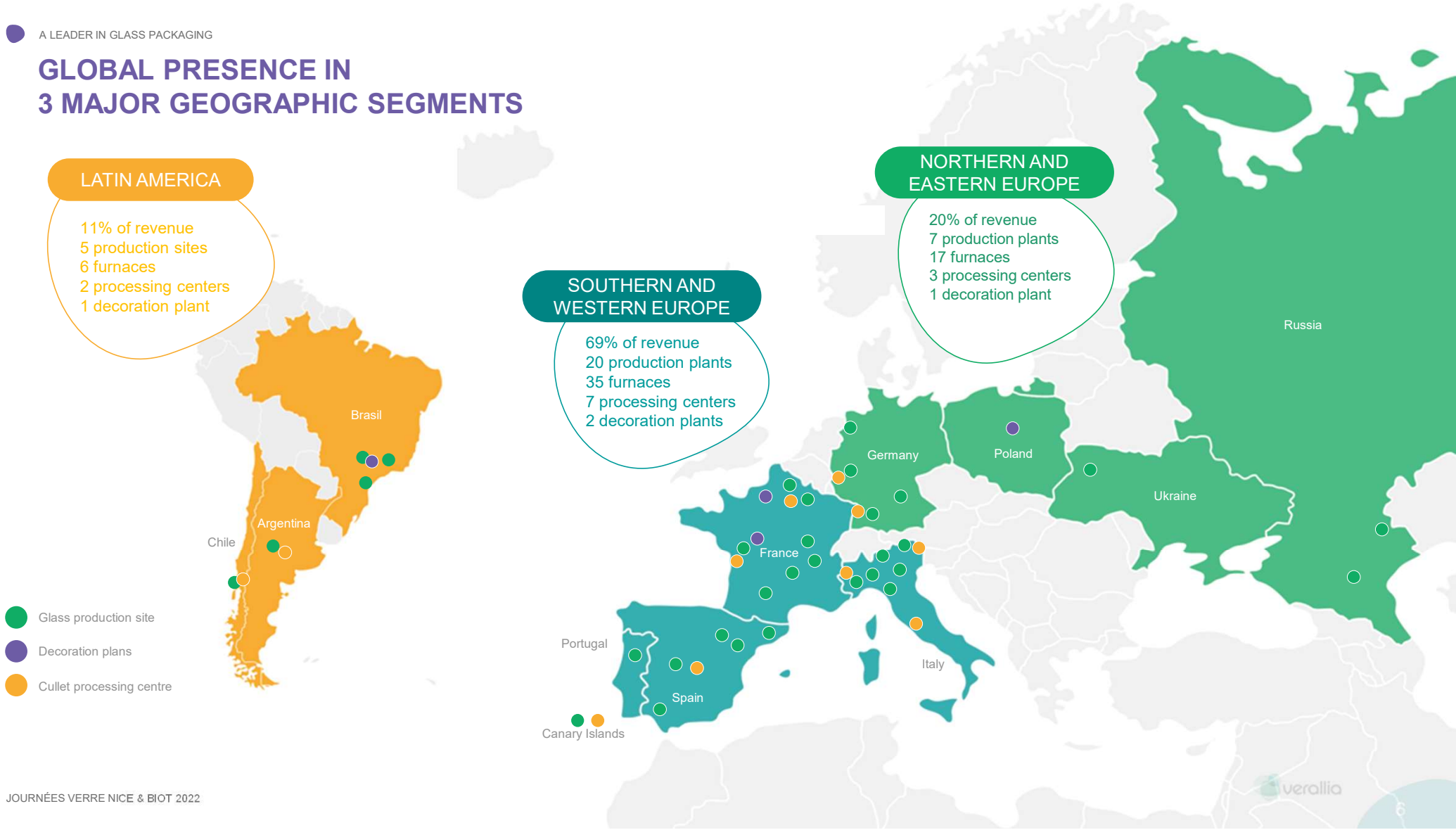
11% of revenue
5 production sites
6 furnaces
2 processing centers
1 decoration plant

SOUTHERN AND WESTERN EUROPE

69% of revenue
20 production plants
35 furnaces
7 processing centers
2 decoration plants

NORTHERN AND EASTERN EUROPE

20% of revenue
7 production plants
17 furnaces
3 processing centers
1 decoration plant



THE FUTURE OF GLASS: STAKES

Why to “re-imagine glass
to build a sustainable future”?

FOR HEALTH AND SECURITY

- **100% inert**, glass does not interact with its contents or alter their taste, scent or composition
  - New research study, published in the journal “Critical Reviews in Food Science and Nutrition”, found that nearly 3000 chemicals can potentially leak from packaging into food, making human exposure to these chemicals highly probable.
  - Of the 2881 Food Contact Chemicals detected, only 47 were detected in the glass & ceramic food contact materials.
- **100% impermeable**, glass guarantees optimal long-lasting conservation, without particle migration.

FOR THE ENVIRONMENT

- Made of natural minerals
- Infinitely and 100% recyclable:
  Glass can be endlessly recycled without loss of material or quality

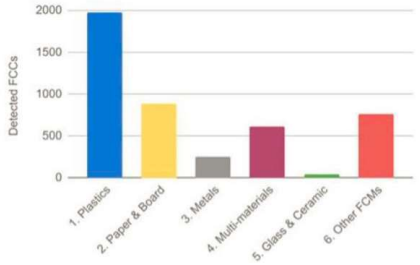


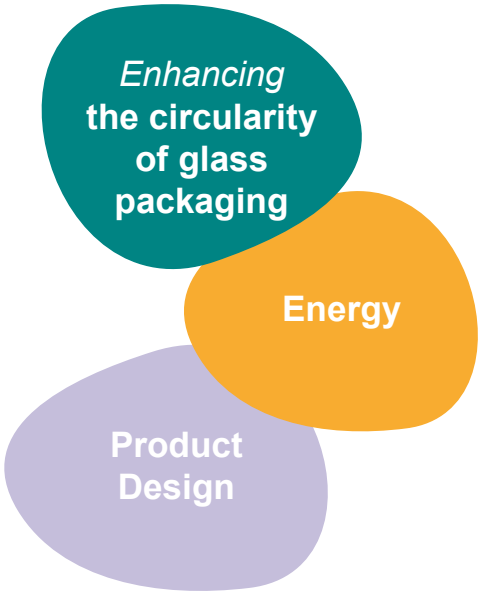
Figure 6. Absolute number of detected food contact chemicals per FCM group.

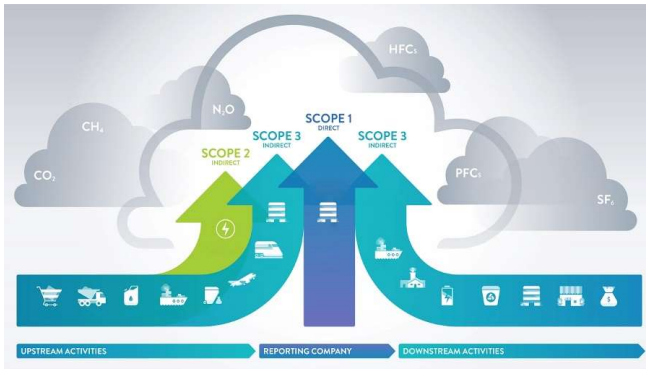
SO WHAT IS AT STAKE?

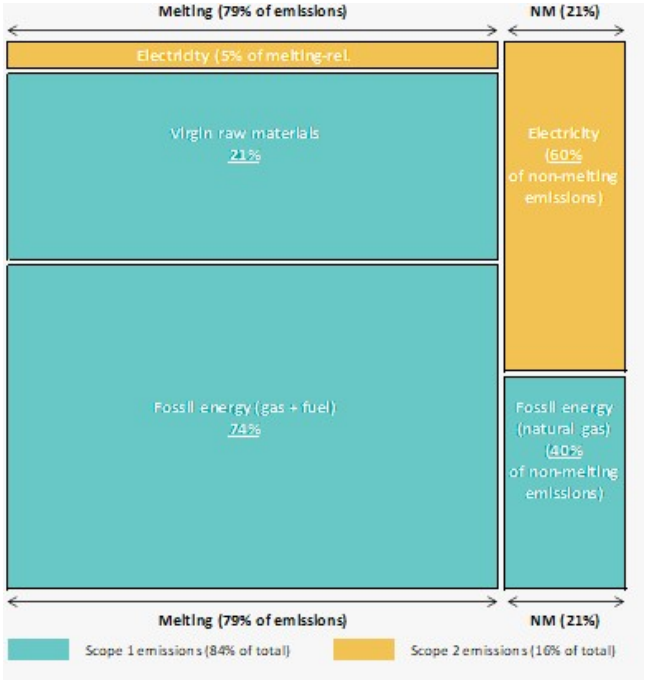
- 1t of glass ≈ 500kg of CO2 (Scopes 1+2 ≈ 420+80)
- Main part is fusion energy but not only

WHICH LEVERS TO REDUCE THE CARBON FOOTPRINT?

- To reduce the ton of CO2 per ton of glass produced (Scope 1 +2)
- To reuse it
- To reduce the weight of articles : direct proportional impact per article







SOME LEVERS

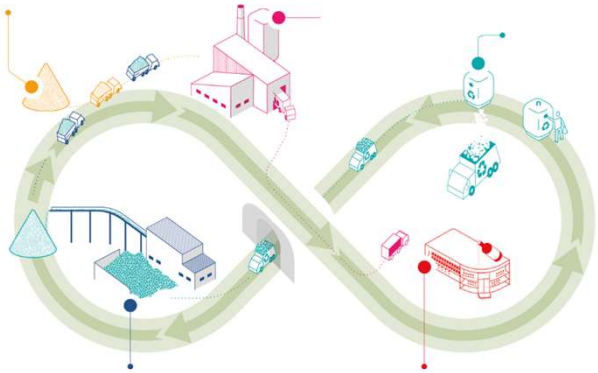
How to make glass a sustainable material for packaging?

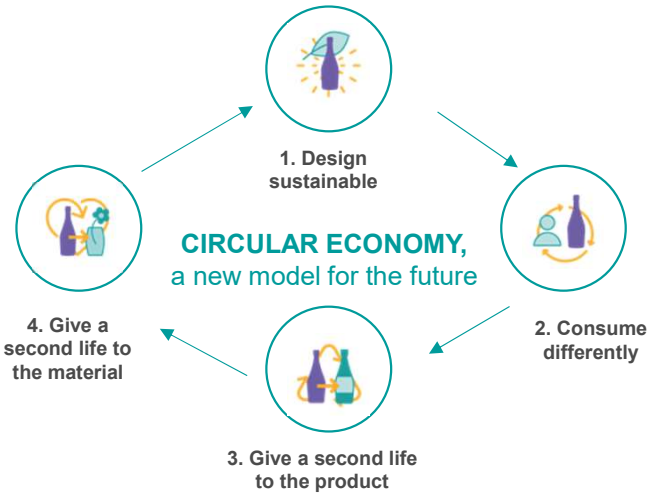
1 *Enhancing* the circularity of glass packaging

From the extraction of raw materials to the eco-design of glass packaging to sorting, to reinvent the glass packaging sector and make the circular economy a reality.

New circularity model:

- **INCREASE glass recycling**
- **and OPTIMIZE the use of cullet**
- **DEVELOP the reuse of glass packaging**





LEVER #1: CULLET

INCREASE CULLET COLLECTION

FEVE* European glass packaging industry **to boost EU glass collection for recycling to 90% by 2030 (from 80% in 2020)**

CLOSE THE GLASS LOOP PROGRAM AMBITIONS

1. MORE
Promote selective glass collection to increase cullet quantity & quality

2. BETTER
Optimize and develop sorting & treatment systems to increase yield and generate more furnace-ready cullet

3. TOGETHER
Exchange of knowledge and best practices in collection, sorting & treatment systems between countries

FRIENDS OF GLASS - SPANISH INITIATIVE VIA ANFEVI

CHIN CHIN Campaign on social media June to September 2020
Influencers on Instagram, Tik Tok plus Youtube video + 5.6 million views

IMPROVE RECYCLING CAPACITY AND EFFICIENCY

INVESTMENT IN CULLET TREATMENT CAPACITY

- Set up **new cullet treatment capacity**
- **Increase the efficiency of recycling process** to
  - improve separation of colored and non colored cullet
  - improve cullet re-use rate in non colored glass

OPTIMIZE CULLET USAGE

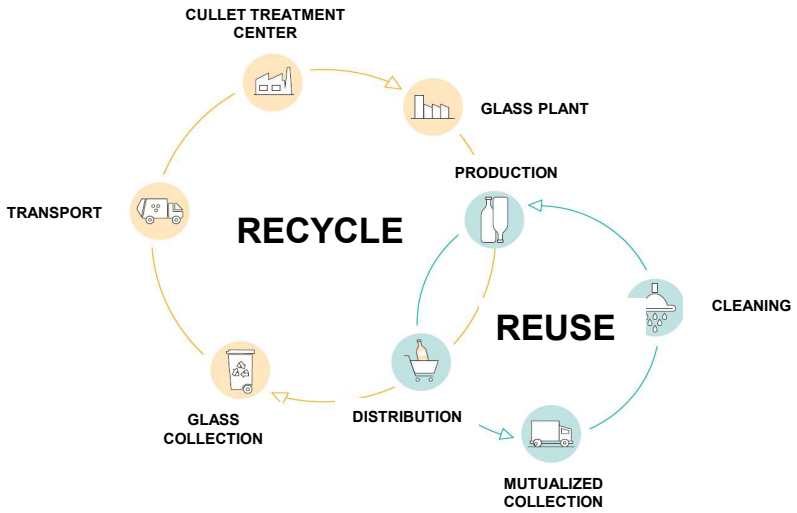
CONTINUOUS IMPROVEMENT OF GLASS CHEMICAL RECIPES

- Optimize glass recipes to add cullet while maintaining final quality

LEVER #2: DEVELOP THE REUSE OF GLASS PACKAGING

To enhance the **circularity of glass** packaging,
we need to work on both cycles: **Recycling & Reuse**

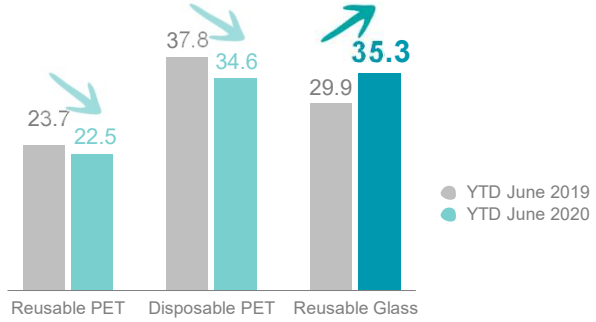
Reuse Glass Bottles supports sustainability and is an opportunity for extra business



Glass is the best positioned material for food products: Inert
Reuse responds to consumer trends: Local / Zero Waste / Ecological
Reuse to compete with other materials: Ecological

REUSE: A LONGSTANDING FEATURE OF THE GLASS INDUSTRY

GERMANY Returnable Glass Bottles (RGB):
Market share of different mineral water container (%)



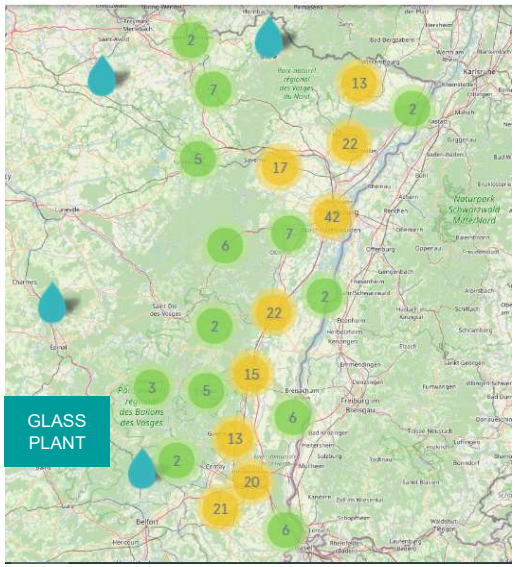
FRENCH REGULATORY FRAMEWORK IS DEVELOPING

Reuse decree (2022)

5% of all packaging to be reused or refilled by 2023
10% in 2027

LEVER #2: DEVELOP THE REUSE OF GLASS PACKAGING

AN EXAMPLE OF A LOCAL REUSE CIRCUIT



Collect points:

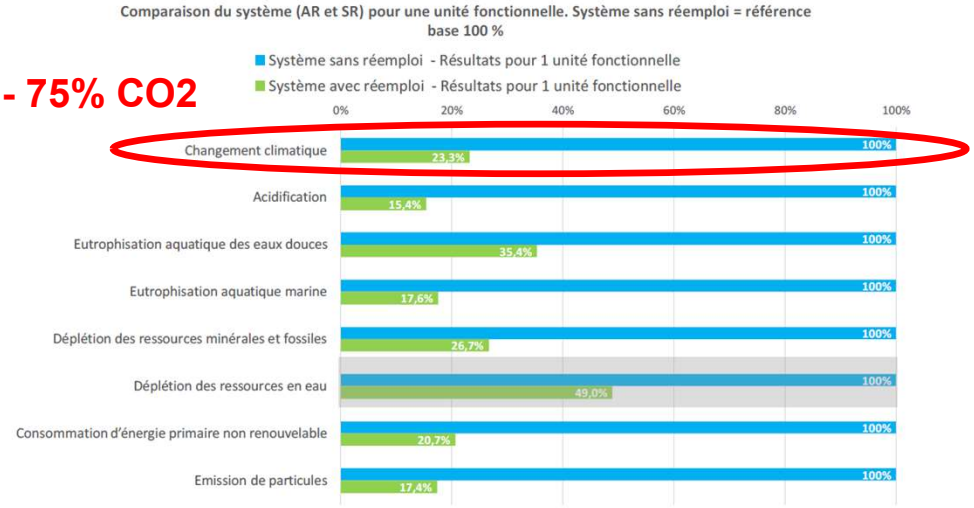
1 <10 > 10

Data : Alsace Consigne (wider than Meteor's network)

- Beer bottle distributed both in one-way and reuse (0,75L)
- 5,4 M reusable bottles sold
- 100km round trip on average in 100 stores
- 22% extra weight for reusable bottles (100g)
- 20 rotations per bottle (deposit of €0.2)

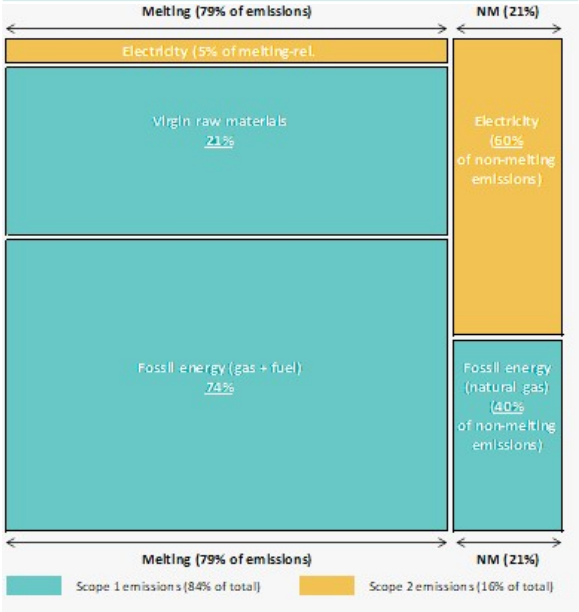
RESULTS

- 75% CO2



2 Energy

3 main levers:
Shift Raw material mix
Reduce energy consumption
Increase use of green energy



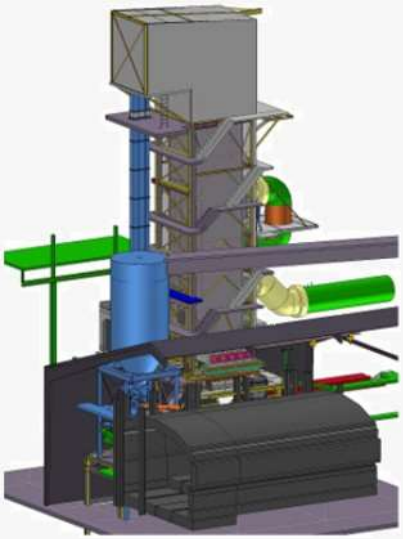
LEVER #1: SHIFT RAW MATERIAL MIX

Cullet rate increase

Shift away from carbonated raw materials

- Soda ash and limestone release CO_2 during melting process
- Find alternatives to these materials, renewable or naturally decarbonated

LEVER #2: REDUCE ENERGY CONSUMPTION



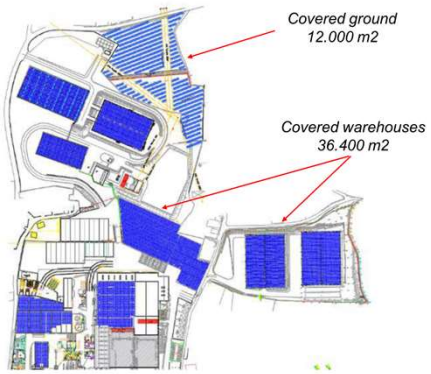
Melting energy reduction (CA 80% of total energy consumed)

- Upgrade of furnace technology (hardware and process control) to address losses, eliminate water ingress via cullet, use of pre-heaters
- Gradual reduction in share of fossil energy used in furnaces, eliminating oil (highest CO2 generator) and maximizing electrical heating:
  - Hybrid furnaces with up to 80% of electricity: to be developed
  - Full electric furnaces

Non melting energy reduction (CA 20% of total energy consumed)

- Address loss reduction on forehearth/heat treatment equipment, optimize supporting fluid generation or heat reuse

LEVER #3: INCREASE USE OF GREEN ENERGY



Solar panels installed on roofs and land in Verallia Portugal plant will start production in 2022

Green energy purchases

- Green energy purchases through certified sources of electricity
- Benefit from government-led actions to reduce CO2 emissions (e.g electricity emission factor reduction or hydrogen introduction in natural gas)

Biofuels utilization

- Replace natural gas with biogases
- Other biofuels like biodiesels,…
- Green-Hydrogen

On-site energy production

- On-site renewable electricity production (e.g solar panels - first project Portugal 2022)

3 Product design

LIGHTWEIGHTING BOTTLES AND JARS

FIGHT BACK AGAINST THE CURRENT WEIGHT INCREASE

OPTIMIZE WEIGHT AND SHAPE

OPTIMIZE PALLETIZATION

AVOID RECYCLING TROUBLEMAKERS

FAVOR LOCAL NETWORKS

MANSO DE VELASCO
Chilean wine
EGO range

- Miguel Torres Chilean winemaker has selected the Bordeaux wine from the EGO (Enhanced geometric Objects) range for his vintages
- Eco-designed bottle
  => 35% weight reduction
  (650 g versus 1,000 g initial)
- Preserved high-end aesthetics, reduced environmental footprint

VEDRENNE
French syrup
Co-conception of eco-designed bottle

- Bottle lightened by 10% compared to the original model
  => **-10% of CO_2** emissions
- Reduction of the diameter to optimize the packaging
  => **+11% more containers per truck**
- Short circuit logic: bottle produced at our Chalon-sur-Saône site, only 30 km away from the bottling site at Védrenne
- Shared desire to reduce our overall environmental impact

SUMMARY

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