FROM A COMPANY TO A VALUE CHAIN APPROACH FOR MATERIAL EFFICIENCY THE EXAMPLE OF BUILDING AND CONSTRUCTION

August 27th, 2020 - Nancy

WORLD MATERIALS FORUM

SAINT-GOBAIN

WMF KPI

Material efficiency KPIs

	KPIs	Description
Use Less	Buy-to-use	Material value in the product / material value used in production
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Source: WMF & Arthur D. Little analysis

Circular economy addresses the challenge of resource availability and intensity

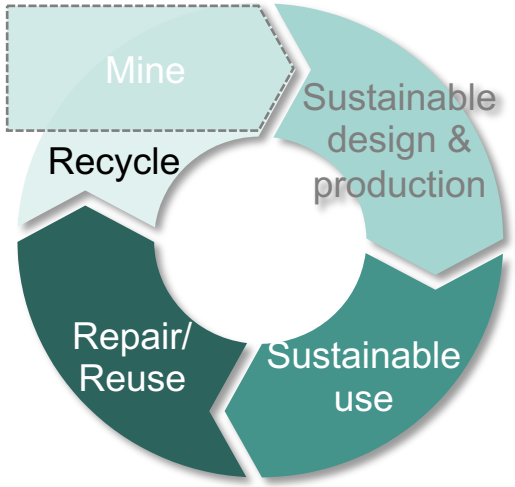
A relentless demand of raw materials…

3x More **extracted materials** compared to 1970

5x More **non-metallic minerals** (mainly sand, gravel and clay) extracted compared to 1970 (44bn tons in 2017)

…consistent with a traditional linear approach to activities

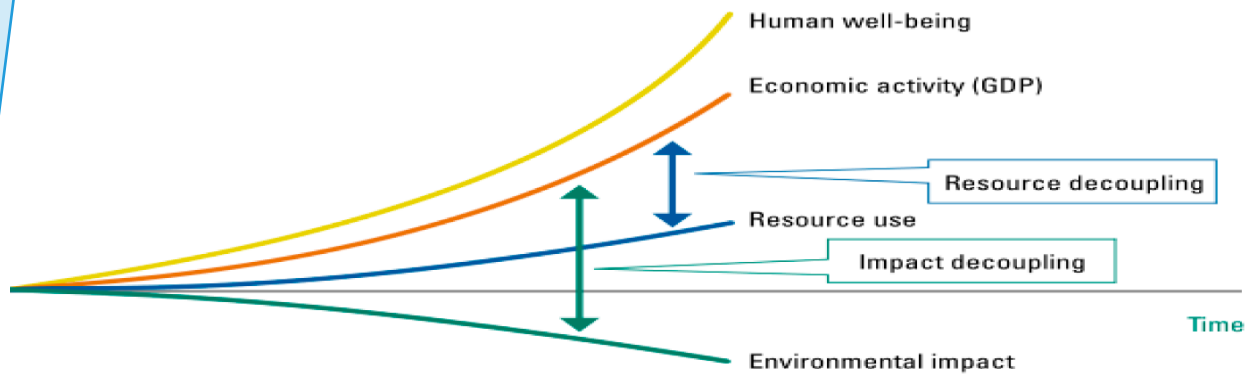
Circular economy as a new business model…



A more circular economy can reduce EU emissions from materials by **56%**

≤1.0x

… in order to decouple GDP and ressource consomption



*Current estimated consumption by Global footprint network
Source: GFN, Circle economy

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An example: circular economy mitigates buildings' impacts

Huge impacts

40% raw materials used to manufacture products and components for the building industry

40% of the solid waste in developed countries comes from construction and demolition

2 main challenges

- To design buildings less intensive in virgin non renewable resources
- To reduce the construction & demolition waste to landfill to zero

Objective 2050 ZERO CARBON

A new building approach

DESIGN & CONSTRUCTION

- Design for adaptability
- Design for deconstruction
- Optimised bill of materials: zero waste jobsites, prefab, 3D printing

USAGE

- Reduced surface m²/person
- Extended lifetime: repair, maintenance, renovation
- Reversibility and modularity, sharing

DECONSTRUCTION

- Building as a « material bank»
- Deconstruction vs demolition
- Early sorting & traceability

Large stakes for Saint-Gobain

2 major issues

Natural resources

- Raw materials, incl. secondary, are increasingly critical
- Generalized rarefaction, mining impact on biodiversity and CO_2

Waste management

- At all stages of product life cycle
- Uneven maturity of technical solutions
- Fragmented value chain

Our ambitions at 3 levels

Product/ systems offering — To be the best in class in circular product offer

Supply chain & operations — To remove technical constraints for higher level of circularity

Network/ services Ecosystem — To be best positioned to capture relevant products after use

Growth *Impact on the top line*

Competitiveness *Impact on the bottom line*

Anticipation, Differentiation, Cost

Products & systems offering

NEW MARKET REQUIREMENTS

Recyclable or reusable products / materials

Durable or repairable products

Recycled or renewable content

Products & systems easy to dismantle

Lightweight solutions

Non toxic materials

Responsibly sourced raw materials

Sustainable packaging

To be the best in class in circular product offer

WHAT DO WE DO?

- ✓ To **develop** better products & systems (**eco-innovation**)
  - ✓ circularity in the innovation process
  - ✓ eco-innovation training
  - ✓ adjusted quantities to demand: kitting, bulk formats, recycling of product cuts off
- ✓ To further **assess** our products & systems performances
  - ✓ Life Cycle Analyses
  - ✓ Scoring with the SCORE tool (for building materials)
- ✓ To better **communicate** the circularity strengths and benefits of our offer

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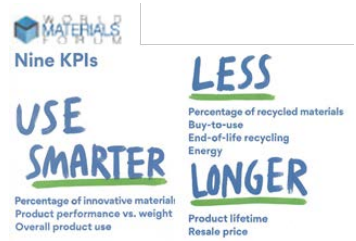
Supply chain & operations

To remove technical constraints for higher level of circularity



Efficient resources intensity

- Lighter products without harming performance

Lightweight car glazing

Reduction in the thickness of all glazing: windscreen, roof, rear window, side windows. Up to:

- -6kg for a standard car
- -0.4g CO2 per km

- Lighter products with same thermal performance

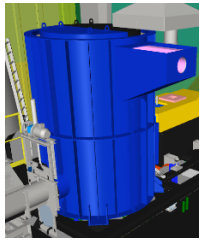
Insulation glass wool: SLIMWOOL program

Plasterboard: SMART BUBBLES program

- Lighter products with same mechanical performance

Develop reprocessing technologies

- In order to recreate a secondary raw material “usable”. Example:
  - SBM for glass and stonewool
  - Gypsum paper separation
  - Glass machine



Optimize quality spec. for recycled material

- Have a process that better “**digests” a larger specification**
- Have the opportunity to **broaden the sources of supply**
  - Quality control
  - Traceability

Operation excellence = efficient resources intensity
(50% of industry cost is material, energy and packages)

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Network / Services / Ecosystem

To be best positioned to capture relevant products after use

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Nine KPIs

LESS
Percentage of recycled materials
Buy-to-use
End-of-life recycling
Energy

USE SMARTER
Percentage of innovative materials
Product performance vs. weight
Overall product use

LONGER
Product lifetime
Resale price

Waste recycling service as a business opportunity

Short term: a possibility of differentiation by service

Medium and long term: a strategic positioning to capture the secondary resource deposit at source and by the service provided

Unique positioning thanks to a multiplicity of businesses

New business models

Product as a service

Customer pays product access and usage, while supplier retains ownership to internalize benefits of circular resource productivity

Reuse

Used products disassembled to be reused for the same application or not in another building

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Different geographical dynamics

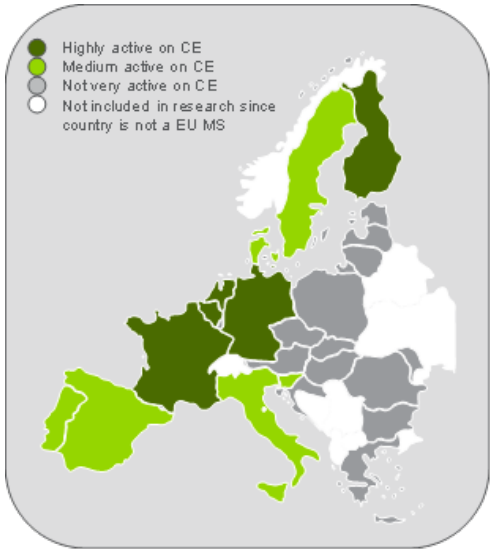
Different level of maturity depending on the country

Different level of demand according to the market

- Construction market
- Industry
- Mobility
- …

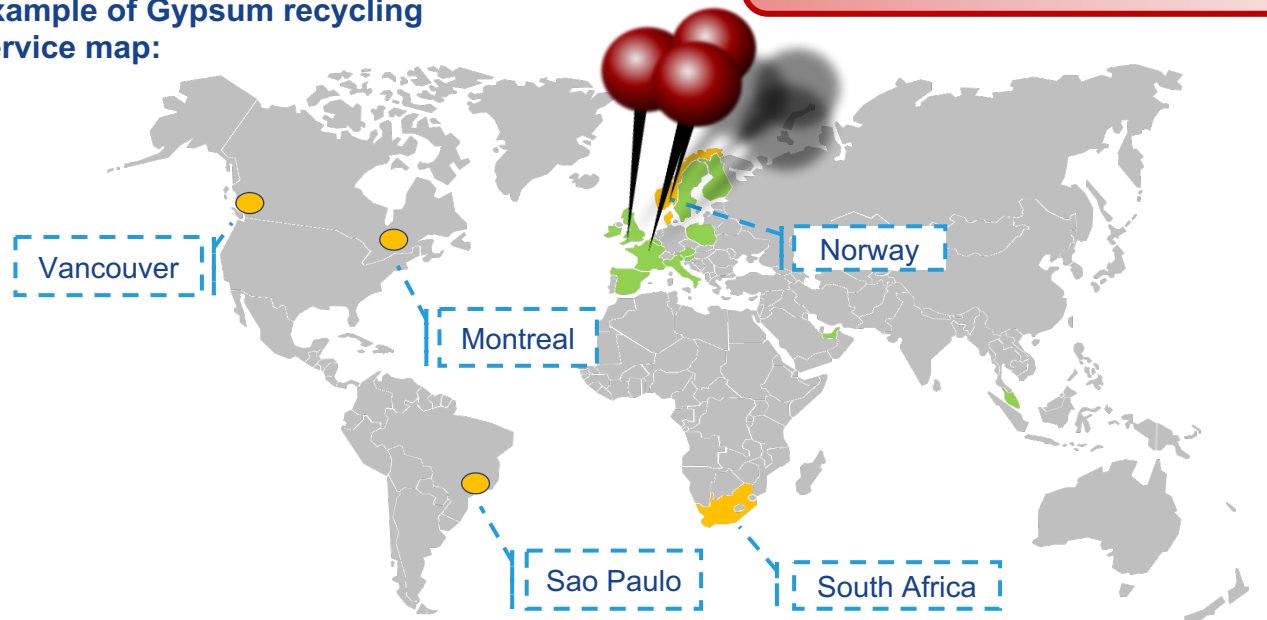
Examples of Circular Economy public policies

Maturity at European level



Glass
Post consumer building glazing initiatives in Fr, UK and Norway

Example of Gypsum recycling service map:



Example of potential short term service

Existing recycling service

WMF KPI – A source of inspiration to move forward

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What ambition and what KPIs for Saint-Gobain?

Product/ systems offering

AMBITION

Circular product offer: to be the best in class

Possible KPI's

- Ecodesign - % coverage
- Assessment (LCA, SCORE, product transparency) - % coverage
- Recyclability - % coverage
- Sustainable packaging - % coverage

Supply chains & operations

To remove technical constraints for higher level of circularity

- « 0 » production waste landfilled
- % recycled / renewable content
- Avoided tons of virgin raw materials
- Intensity of virgin raw material in kg/(€ of turnover)

Network/ services Ecosystem

To be best positioned to capture relevant products after use

- Waste management services (distribution and industrials)
  - ➢ Geographical coverage
  - ➢ Businesses coverage
- Development of new business models

Level of ambition and roadmaps by countries / regions and BUs with relevant basket of KPIs