FACING SUSTAINABILITY CHALLENGES: THE SECRET POWER OF FACADES

Pascal Eveillard - October 2019
THE BUILT ENVIRONMENT HAS A HUGE IMPACT ON THE ENVIRONMENT...

- 33% OF ENERGY CONSUMPTION
- 39% OF GREENHOUSE GAS EMISSIONS
- 40% OF RAW MATERIAL CONSUMPTION
- 40% OF SOLID WASTE EMISSIONS (in developed countries)

+50% RAW MATERIALS DEMAND BY 2030
+40% WATER DEMAND BY 2030
+40% ENERGY DEMAND BY 2030
...AND ON PEOPLE’S HEALTH & WELLBEING

33% OF ENERGY CONSUMPTION

39% OF GREENHOUSE GAS EMISSIONS

40% OF RAW MATERIAL CONSUMPTION

40% OF SOLID WASTE STREAMS (in developed countries)

+50% RAW MATERIALS DEMAND BY 2050

+40% WATER DEMAND BY 2030

+40% ENERGY DEMAND BY 2030

80% ADULTS

90% CHILDREN

As per WHO*
Time spent indoors

9bn PEOPLE BY 2050

70% OF THE POPULATION LIVING IN URBAN AREAS BY 2050

*World Health Organization
3 MAJOR SUSTAINABILITY CHALLENGES FOR THE CONSTRUCTION MARKETS

HEALTH & WELLBEING

TOWARDS ZERO CARBON

CIRCULAR ECONOMY

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We help to create great living places and improve daily life ... by designing, manufacturing and distributing materials & solutions ...

...enhancing people’s health & wellbeing while reducing buildings’ environmental impacts
We promote sustainable construction and contribute to defining requirements and standards for sustainable buildings.

We deliver solutions that enable our customers to build and renovate more sustainably.
OUR OCCUPANTS’ CENTRIC VISION FOR SUSTAINABLE BUILDINGS

BUILDING(S) FOR PEOPLE

WE ONLY HAVE ONE PLANET
FACADES AT THE VERY HEART OF OUR APPROACH

Beyond aesthetics…

…building envelope quality is key to deliver sustainable performance
LEADING SUPPLIER OF PRODUCTS & SYSTEMS FOR FACADES

ETICS
Ventilated Facades external insulation
Glass curtain walls
Cavity walls

Render
Insulation
Reinforcement/mesh
Gypsum / cement boards
Fixations

Glass panels
Glass cladding
Window glass
Insulating Glazing Units
Electrochromic glass
BUILDING GLASS SUSTAINABLE SOLUTIONS
TOWARDS MORE RESOURCE EFFICIENT BUILDINGS

**DESIGN & CONSTRUCTION**

Building design:
- adaptability, easiness of dismantling, modularity...
- Optimised bill of materials
- Zero waste jobsite
  - Modular, prefab, 3D printing

**USAGE**

Extended building life time
- Repair, maintenance, renovation
- Reversible and modular
- Reorientation of the usages (sharing, leasing ….)

**DECONSTRUCTION**

Building as a « material bank »:
- Material passport, transparency, traceability
- Deconstruction versus demolition
- Early sorting
- Recycling / reuse
  - Zero waste to landfill
OUR 3 FIELDS OF ACTION

1. BETTER PRODUCT DESIGN
   solutions easier to dismantle, separate, collect, reuse or recycle

2. MORE RECYCLED CONTENT IN OUR GLAZING

3. NEW SOLUTIONS FOR END OF LIFE GLAZING
MORE RECYCLED CONTENT IN OUR GLAZING

• In average **30%** recycled glass (cullet),
  • Incl. 11% cullet returned from glass processors (pre consumer recycled content)
  • <1% post consumer cullet

• Objective: **50%** by 2025

• Already 45% in the UK

• Flat glass can only be made from flat glass. It is very demanding!

“it is a challenge to accept more recycled materials in our floats, incl. extension to post consumer glass from old windows and facades”
A Deloitte sustainability study showed that despite its recyclability, end-of-life building glass is almost never recycled into new glass products. Instead, it is often crushed together with other building materials and put into landfills or recovered to low-grade fill applications.

**EU 28: >1.5 Mt glass waste arising from renovation & demolition**

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<thead>
<tr>
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<th>Residential sector</th>
<th>Tertiary sector</th>
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<tbody>
<tr>
<td>Glass waste from DEMOLITION (10% of total waste arisings) (tonnes)</td>
<td>260 822</td>
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<tr>
<td>Glass waste from RENOVATION (83% of total waste arisings) (tonnes)</td>
<td>1 279 882</td>
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<td>Residential sector</td>
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<td>825 676</td>
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**UK ~ 199.000 t**
NEW SERVICES FOR END-OF-LIFE GLAZING

• We can take back flat glass waste to be recycled into new flat provided quality specifications are met.
• Contamination is the biggest technical challenge to overcome.
• Best way is to control contamination at source: removal of the glazing units from the building site to a factory environment for proper disassembly.
• Necessary to raise awareness among professionals…
• …and to lead on site-experimentations
PILOTS IN FRANCE

Renovation or demolition site: separate collection of the windows / facade elements

Transportation to the recycling partner (containers or storage racks)

Manual separation frame / glass

Transportation of the cullet to the production site

LEGEND
- Saint-Gobain floats
- Recycling partners
PILOTS IN FRANCE
Former RENAULT office building in Rueil Malmaison
Built in 1986
De-construction in 2019
Flat glass volume: 500t
Some of the original patterned glass panes replaced with clear flat glass;
123t of the original glass removed and sent back to Saint-Gobain float;
Some of the patterned glass reused in new double-glazed units for the tower.
UK: NEW TYPE OF PROCESSING MACHINE

• Safe industrialized processing of post-consumer double-glazed units
• Simple and low-cost machine: can be deployed at more regional locations with more customers and partners – for mutual benefit.
• A second-generation machine which further simplifies the process has been developed and will be deployed with the first user in October 2019.
Developed by engineers based at Saint-Gobain’s float plant at Eggborough.

This initiative has helped to increase the Eggborough cullet ratio well above 40%.
TOWARDS ZERO CARBON BUILDINGS

- Zero or positive energy new constructions
- Deep energy renovations of existing buildings
- Renewable energies
- Low carbon materials & systems

NEED TO REDUCE CARBON EMISSION AT ALL STAGES

2050 OUTLOOK (IEA figures)

- Actual Building emissions
- Future Building emissions
- Energy efficiency
- Renewable energies
- Products carbon footprint
- Target <2 in 2050

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New York, 23/09/2019: signature of the Global Compact’s pledge “Business ambition for 1.5°C”

For a worldwide group involved in heavy-industry manufacturing (such as glass manufacture) this is an ambitious vision, but deliverable with investment in innovation, research and development.”
VISION: FOCUS ON EMBODIED CARBON

2030

- Less embodied carbon, at least, with significant upfront carbon reduction, for all new buildings, infrastructure and renovations.
- Zero operational carbon for all new buildings.

2050

- Zero embodied carbon for all new buildings, infrastructure and renovations.
- Zero operational carbon for all existing buildings.
REDUCING THE CARBON FOOTPRINT OF OUR MATERIALS & PRODUCTS

• Energy efficiency
• Low carbon energies & Renewables
• Low carbon raw materials & recycled content
• Product design
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One ton of cullet into a flat glass furnace reduces CO₂ emissions by 300 kg by lowering the energy consumption.

3% less energy used for every 10% of cullet

Cullet = decarbonated material
RENEWABLES WITH BUILDING INTEGRATED PV
LESS ENERGY NEED FOR HEATING, COOLING AND LIGHTING

Protection from the sun heat – Solar Control Glass
Solar control glass reduce overheating within buildings whilst letting the daylight in.

Protection from the cold – Low-e Glass
Double or triple glazing significantly reduces heat loss to the exterior, reducing the energy usage for internal heating.

# insulated glass
# coated glass products
# low emissivity glass
# solar factor
# high selectivity solar control
# light transmission
# U values
Electronically tintable glass solutions to control the sunlight and heat entering a building, helping to improve the buildings energy efficiency whilst enhancing personal comfort and access to daylight.
SOLUTIONS FOR VISUAL COMFORT

• Solutions with up to **90% light transmittance** to enable occupants to benefit from natural light as well as to manage glare.

• Supplier of **overlength** glass 18 x 3.21 meters.

# Light transmission  # Glare control  # Selectivity  # Larger Glass
Saint-Gobain’s high-performance acoustic glazing can reduce exterior noise by up to **50 dB** (Rw).
TO CONCLUDE
WORKING WITH SAINT-GOBAIN

A KNOWLEDGE PARTNER READY TO COLLABORATE ON BUILDING GREEN

A SOLUTION PROVIDER FOR YOUR GREEN BUILDING PROJECTS
A unique digital service
Find the right solutions and the right documents

Link: https://greenbuilding.saint-gobain.com
WE COMMUNICATE THE ENVIRONMENTAL IMPACTS OF OUR PRODUCTS

MORE THAN 900 VERIFIED EPDs

BASED ON INTERNATIONAL STANDARDS:
ISO 14025,
ISO 21930/EN 15804

Number of EPDs per activity:

- Insulation: 425
- Gypsum: 1,000
- Weber: 90
- Glass*: 30
- Ecophon: 30
- Certainteed: 20
- Other: 10
- PAM: 5

*Covering more than 246 products configurations

Some of our brands which have EPDs:

- Saint-Gobain
- Vetrotex
- Gyproc
- ISOVER
- CertainTeed
- Saint-Gobain

Program operators where our EPDs are published:

- UL
- EPD
- bre
- e3
- epcorange
- inies
- EPD
- bre
- e3

Countries where products are covered with EPDs:

- Europe:
  - Austria
  - Belgium
  - Czech Republic
  - Denmark
  - Finland
  - France
  - Germany
  - Hungary
  - Ireland
  - Italy
  - Norway
  - Poland
  - Portugal
  - Romania
  - Spain
  - Sweden
  - Switzerland
  - UK

- North America:
  - North America

- South Africa

- Asia:
  - North America
  - Colombia
  - Iran
  - Argentina

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THANK YOU FOR YOUR ATTENTION

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