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SUSTAINABLE CONSTRUCTION  
BY SAINT-GOBAIN



ARCHITECTURE  
**STUDENT**  
CONTEST

Before 2015

2015-2025

2003 Saint-Gobain Principles of Conduct and Action

2003 Signature of the UN Global Compact

2009 Compliance program formalization

2014 Sustainable habitat roadmap

2015  SUSTAINABLE DEVELOPMENT GOALS



2015 Setting of ambitious targets by 2025:



**-20%**  
CO<sub>2</sub>  
emissions



**-80%**  
water  
discharge



**-50%**  
non-recovered  
waste

*vs. 2010 at iso-production*

2019 Signature of UN Global Compact pledge targeting carbon neutrality by 2050



Making the  
World a  
Better Home

BE THE WORLDWIDE  
LEADER IN LIGHT &  
SUSTAINABLE  
CONSTRUCTION

GROW &  
IMPACT

2021-2025

# TWO LEVELS OF CONTRIBUTION TO MAKE THE WORLD BETTER HOME



**Maximize  
our impact**



**Minimize  
our footprint**



**Avoided  
emissions: 40x our  
footprint**

*for our customers,  
from our solutions  
sold in 1 year*



**2050  
NET ZERO CARBON**

~1,300 Mt on all 3 scopes, >100x on scope 1 & 2



# TWO LEVELS OF CONTRIBUTION TO MAKE THE WORLD BETTER HOME



Maximize our impact



Minimize our footprint



Sustainability



Performance



*“ We cannot continue to build as we did in the past. It is NOT sustainable ! ”*

*“ We need to build better! ”*



# WHAT DOES IT MEAN FOR BUILDINGS?



For us, over their whole life cycle, buildings should enhance **people's health & wellbeing** while having reduced **footprint on the planet**. They should offer **better economic value and quality** for the developers, owners and occupants.

## SUSTAINABILITY

### BETTER FOR THE PLANET



Energy & carbon



Resources & circularity

### BETTER FOR PEOPLE



Health & safety on jobsites



Health & wellbeing indoor

**SUSTAINABLE  
CONSTRUCTION  
BY SAINT-GOBAIN**

### BETTER ECONOMIC VALUE



Productivity



Cost of ownership

### BETTER QUALITY



Reliability



Finishing aesthetics

## PERFORMANCE

# 12 DRIVERS FOR MORE SUSTAINABLE BUILDINGS



## REDUCED BUILDING-RELATED ENVIRONMENTAL IMPACTS

### BETTER FOR THE PLANET



Energy & carbon



Resources & circularity

1. Reduced operational carbon
2. Reduced embodied carbon emissions
3. Reduced use of non-renewable resources
4. Reduced freshwater consumption
5. Increased lifetime and use rate
6. Reduced amount of non valorized C&D waste

## ENHANCED HEALTH & WELLBEING

### BETTER FOR PEOPLE



Health & Safety on jobsites

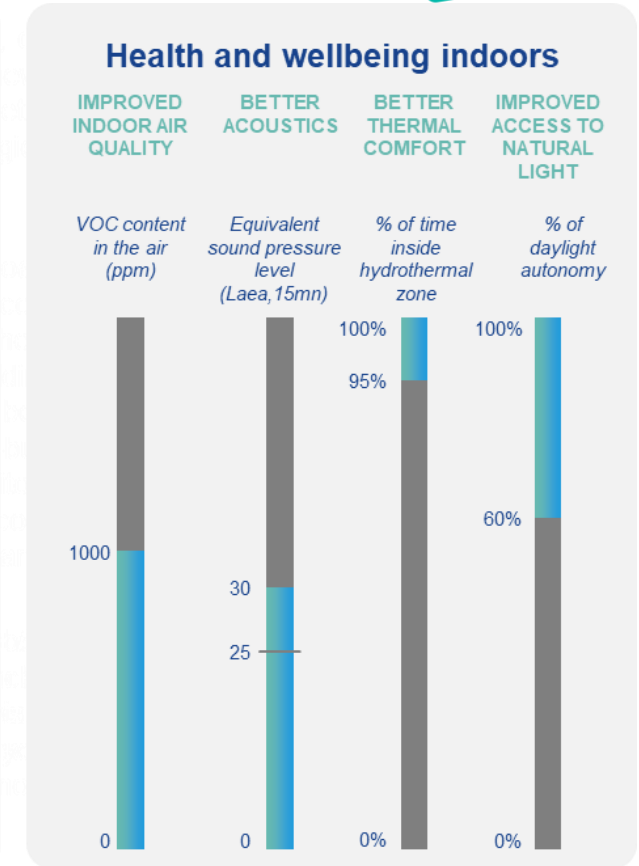
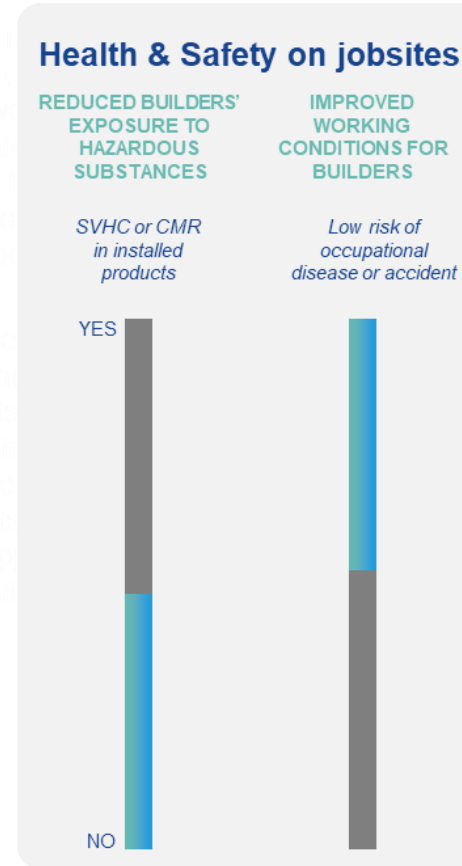
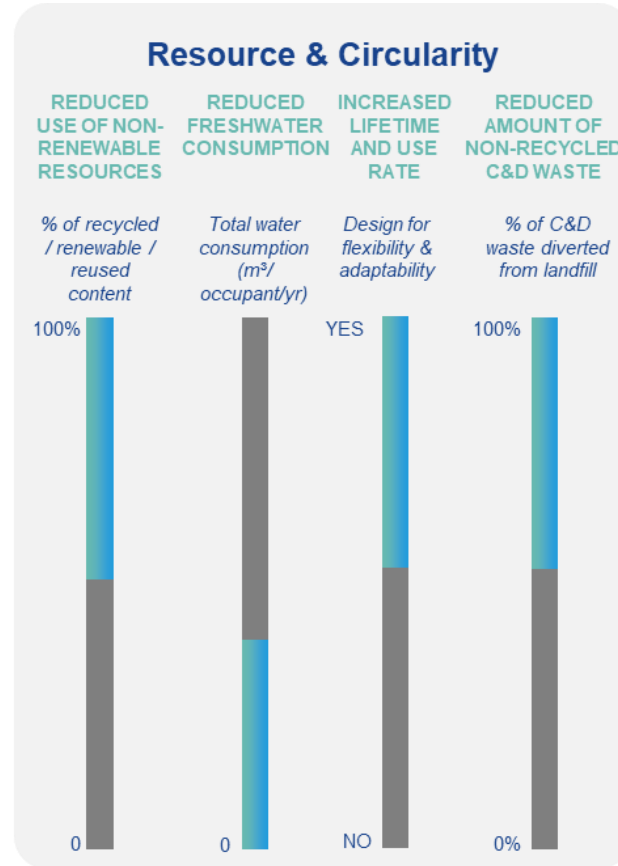
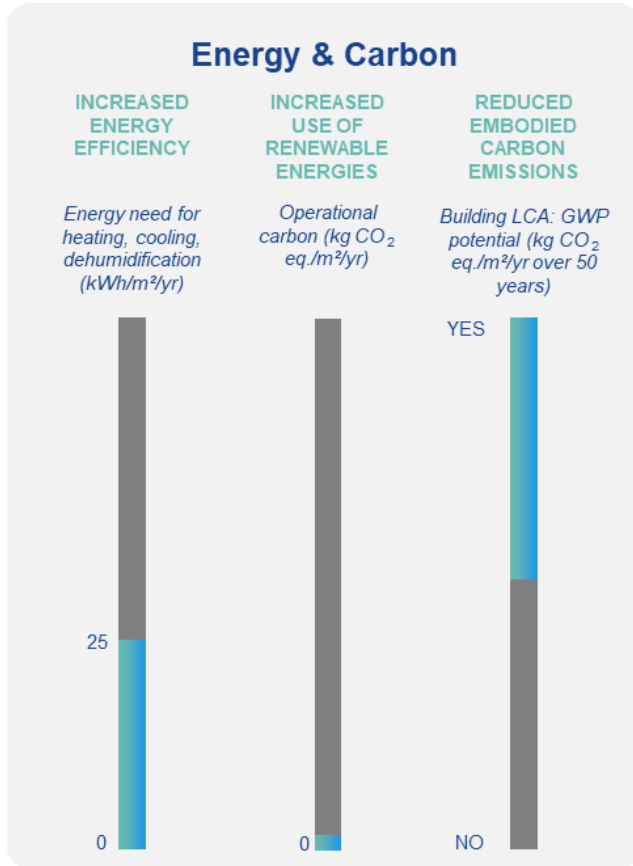


Health & Wellbeing indoors

7. Reduced builders' exposure to hazardous substances during installation
8. Improved working conditions for builders
9. Improved indoor air quality
10. Better acoustics
11. Better thermal comfort
12. Improved access to natural light



# A WHOLE BUILDING APPROACH





# ENERGY AND CARBON

# BUILDINGS HAVE A KEY ROLE TO PLAY IN DECARBONATION



33%

OF ENERGY  
CONSUMPTION



39%

OF GREENHOUSE  
GAS EMISSIONS



Material

Transport

Installation

Building's life

End of life

The challenge: to reduce the carbon emissions over the **WHOLE BUILDINGS' LIFE CYCLE**

# THE DRIVERS FOR MORE SUSTAINABLE BUILDINGS

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## REDUCED BUILDING-RELATED ENVIRONMENTAL IMPACTS

### BETTER FOR THE PLANET

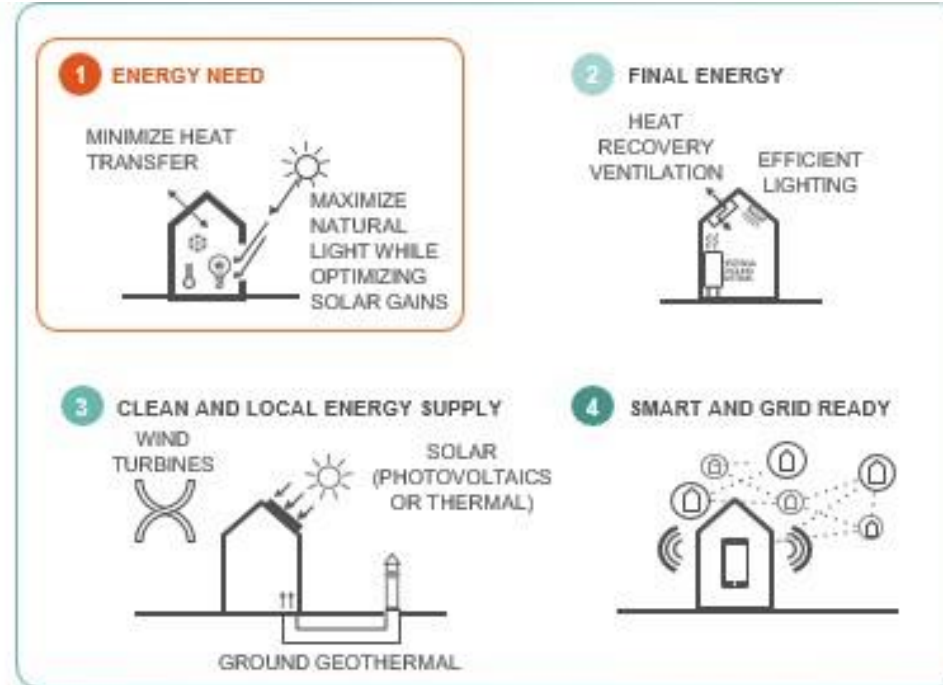


Energy  
& carbon

1. **Reduced operational carbon**
2. **Reduced embodied carbon emissions**



# REDUCED OPERATIONAL CARBON: ENERGY EFFICIENT ENVELOP 1<sup>ST</sup>



- ✓ Insulation systems
- ✓ Glazing and façade systems
- ✓ Smart membranes for air tightness & moisture management



# REDUCED EMBODIED CARBON EMISSIONS



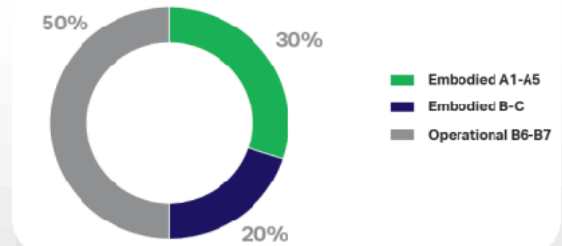
Less carbon over the whole life cycle in products & materials used in the building.

INDICATOR:

**Global Warming Potential (kg CO<sub>2</sub>eq)**  
*calculated in the building life-cycle assessment.*



Estimated Distribution of Carbon Emissions per Life Cycle Stage

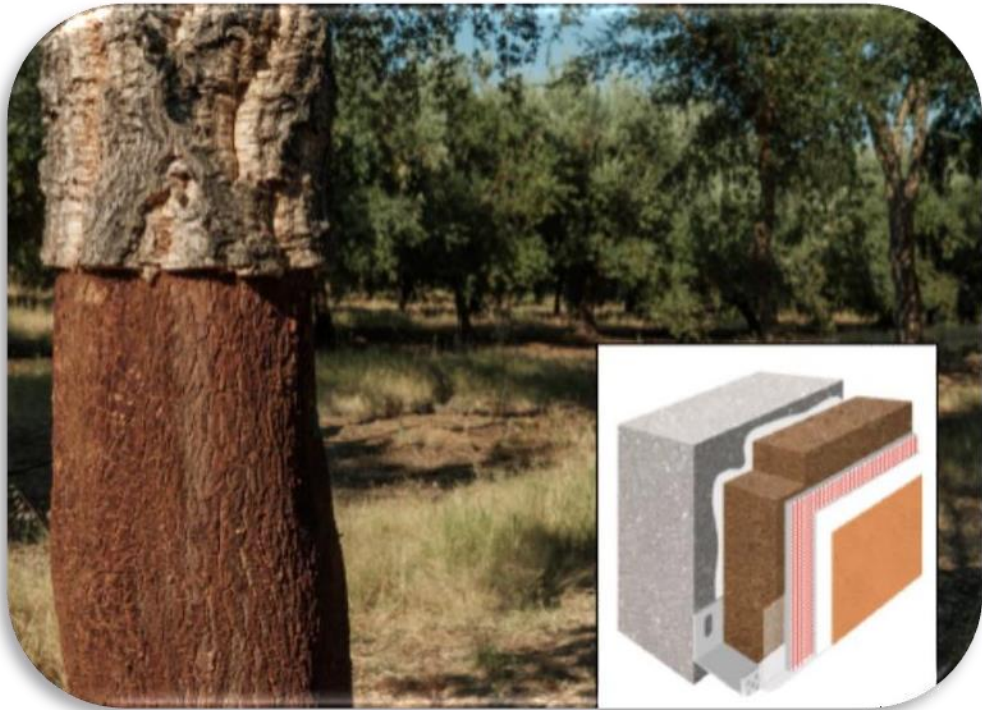


- ✓ **Products & materials with a reduced carbon footprint, incl. biosourced products**
- ✓ **Lightweight constructions**



# BIOSOURCED PRODUCTS

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✓ ETICS with cork insulation



✓ Wood fiber insulation

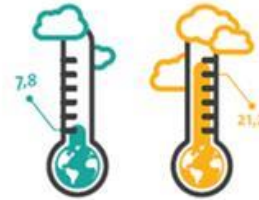


# LIGHTWEIGHT SYSTEMS: E.G. FOR INTERNAL PARTITION WALLS

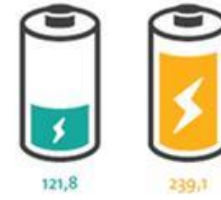


..... The environmental benefit of using drywall systems instead of brick systems, on 1m<sup>2</sup> of wall profile

**1m<sup>2</sup>** For 1 m<sup>2</sup> of partitions walls, using drywall systems instead of traditional systems **would save:**



**63%**  
reduction in global warming potential (kg CO<sub>2</sub> equiv/FU)



**49%**  
reduction in primary energy use (MJ/FU)

..... Two wall profiles commonly used in Brazil, were assessed in this study, as described below:

THE PLACO® DRYWALL SYSTEM:



Insulated metal stud drywall

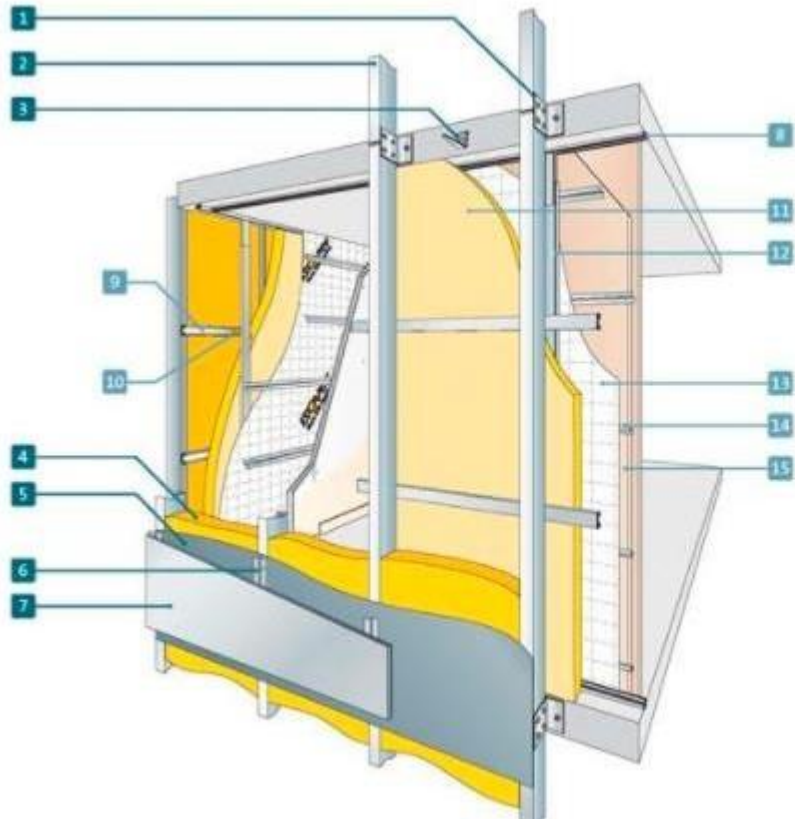
THE TRADITIONAL WALL SYSTEM:



Cement plastered 140 mm large brick



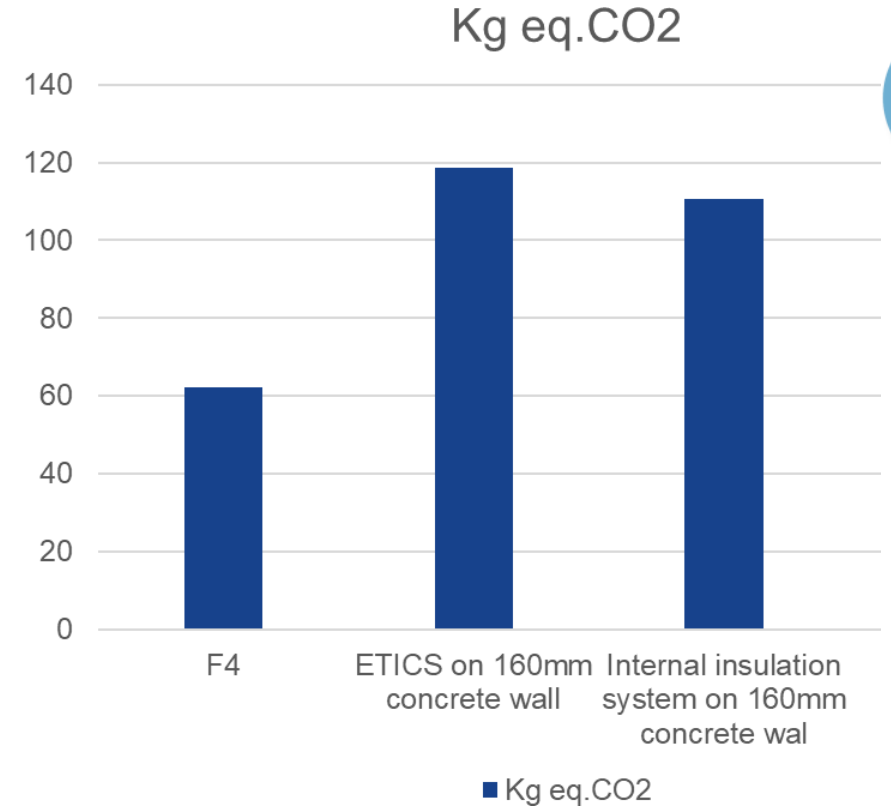
# LIGHTWEIGHT SYSTEMS: E.G. FOR FACADES



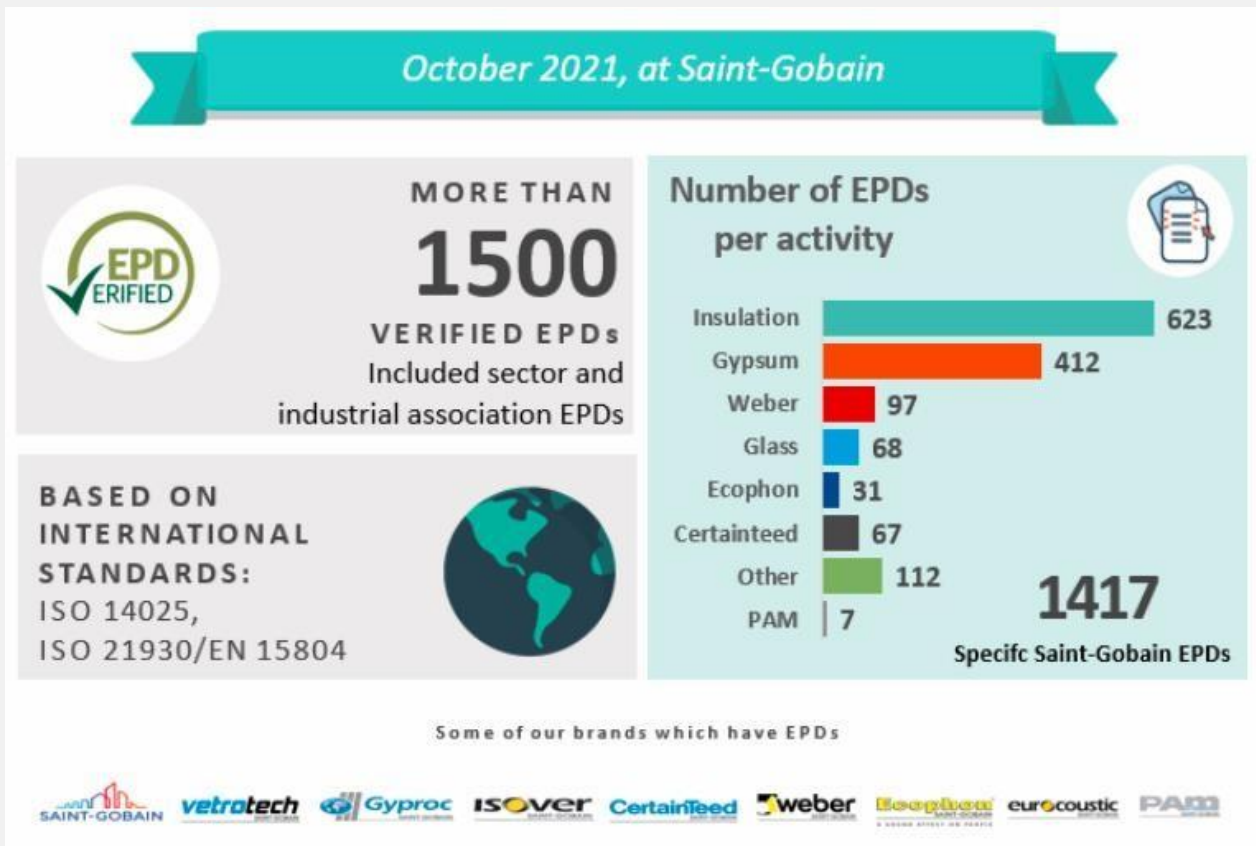
- 1 Platine F4
- 2 Profilé F4
- 3 Maxi PB Fix
- 4 Isofaçade 32
- 5 Pare-pluie F4
- 6 Profilé Interface bardage
- 7 Bardage
- 8 Lisse Clip' Optima
- 9 Fournure Optima
- 10 Appui Optima2
- 11 Isoconfort 32
- 12 Fournure + Eclisse Optima
- 13 Membrane Vario Duplex
- 14 Profilé Stil Mob
- 15 Placoplatre BA13



FAÇADE F4



# KNOWING AND SHARING OUR PRODUCTS' ENVIRONMENTAL IMPACTS





# RESOURCES & CIRCULARITY

# BUILDINGS HAVE A KEY ROLE TO PLAY IN CIRCULAR ECONOMY



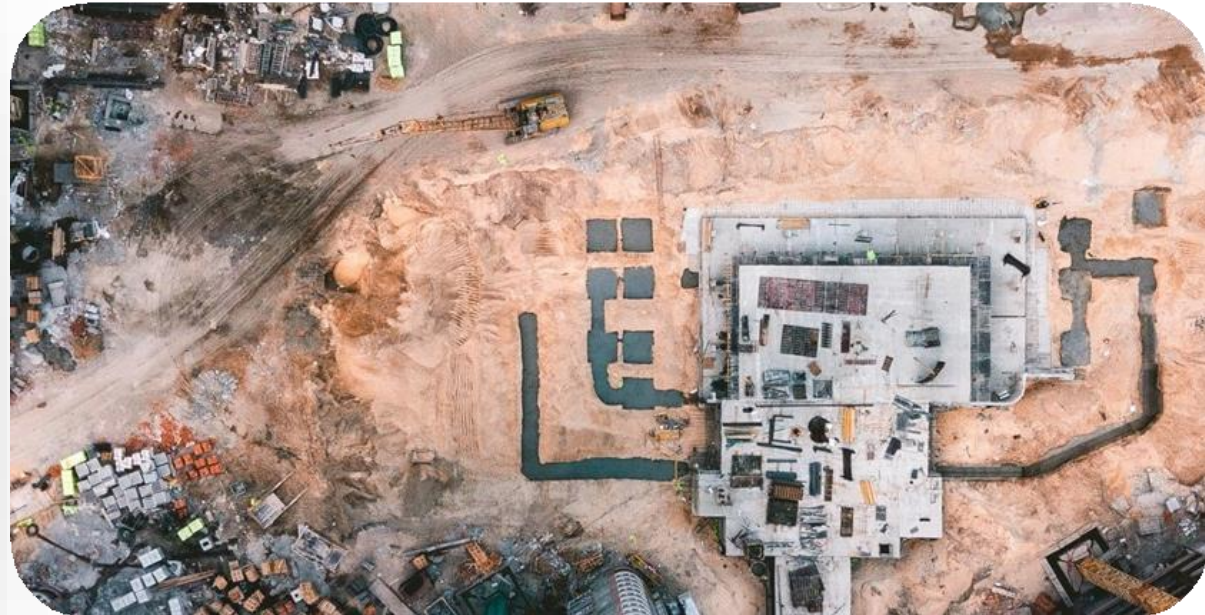
**40%**

OF RAW MATERIAL  
CONSUMPTION



**40%**

OF SOLID WASTE  
STREAMS\*



## The challenges:

To use less virgin non  
renewable resources

To reduce waste to landfill  
to zero



# THE DRIVERS FOR MORE SUSTAINABLE BUILDINGS

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## REDUCED BUILDING-RELATED ENVIRONMENTAL IMPACTS

### BETTER FOR THE PLANET



Resources & circularity

3. Reduced use of non-renewable resources
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# RESOURCES AND CIRCULARITY



## REDUCED USE OF NON-RENEWABLE RESOURCES

over the whole building life cycle.

### INDICATOR:

% of recycled or renewable or reused content

- Reused material and product
- Products and packaging with high recycled or renewable content
- Less resources-intensive systems and solutions
- Reduced bill of materials



## REDUCED FRESHWATER CONSUMPTION

over the whole building life cycle

### INDICATOR:

Total water consumption (m<sup>3</sup> / occupant / year)

- Solutions with a low water footprint
- Dry technologies on jobsites
- Solutions to recycle graywater and collect rainwater



## INCREASED LIFETIME AND OCCUPATION RATE

### INDICATOR:

Projected service life of the building (years)

- Adaptability and flexibility over time
- Resilience (capacity to resist to disruptive events, for instance climate change)
- Durable materials
- Easy repair and maintenance



## REDUCED AMOUNT OF NON VALORIZED C&D WASTE

### INDICATOR:

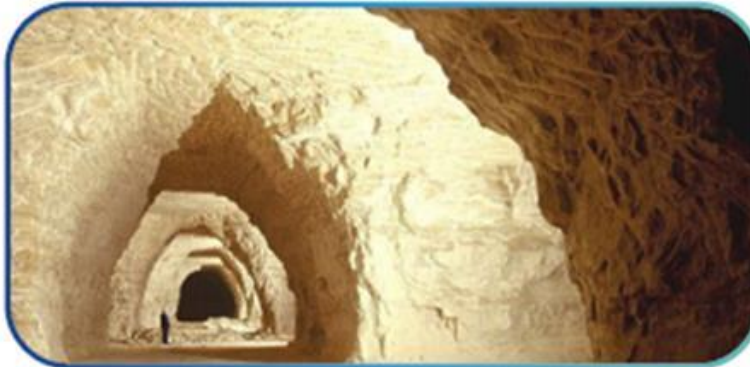
Volume of C&D waste diverted from landfill

- Zero waste jobsite
- Deconstruction potential (ease of disassembly)
- Traceability
- Materials free of hazardous substances
- Recyclable or reusable materials and packaging
- Recovery solutions

# RESOURCES: REDUCING FOOTPRINT



10.1Mt virgin non-renewable raw materials avoided in production process



92% production waste recovered

Use of recycled materials and by products



Substitution of all plastic bags with paper packaging for mortars in Brazil<sup>3</sup>

- ✓ Reduced use of non renewable raw materials
- ✓ Extended time of use
- ✓ Reusable / recyclable

# RESOURCES: MAXIMING OUR IMPACT

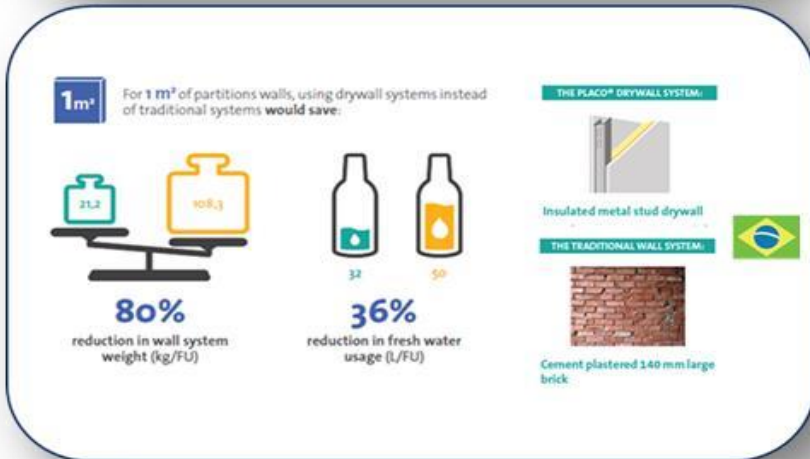


**EASY TO DISMANTLE PRODUCTS & SYSTEMS**



**WASTE MANAGEMENT SERVICES**

**LIGHTWEIGHT PRODUCTS & SYSTEMS**



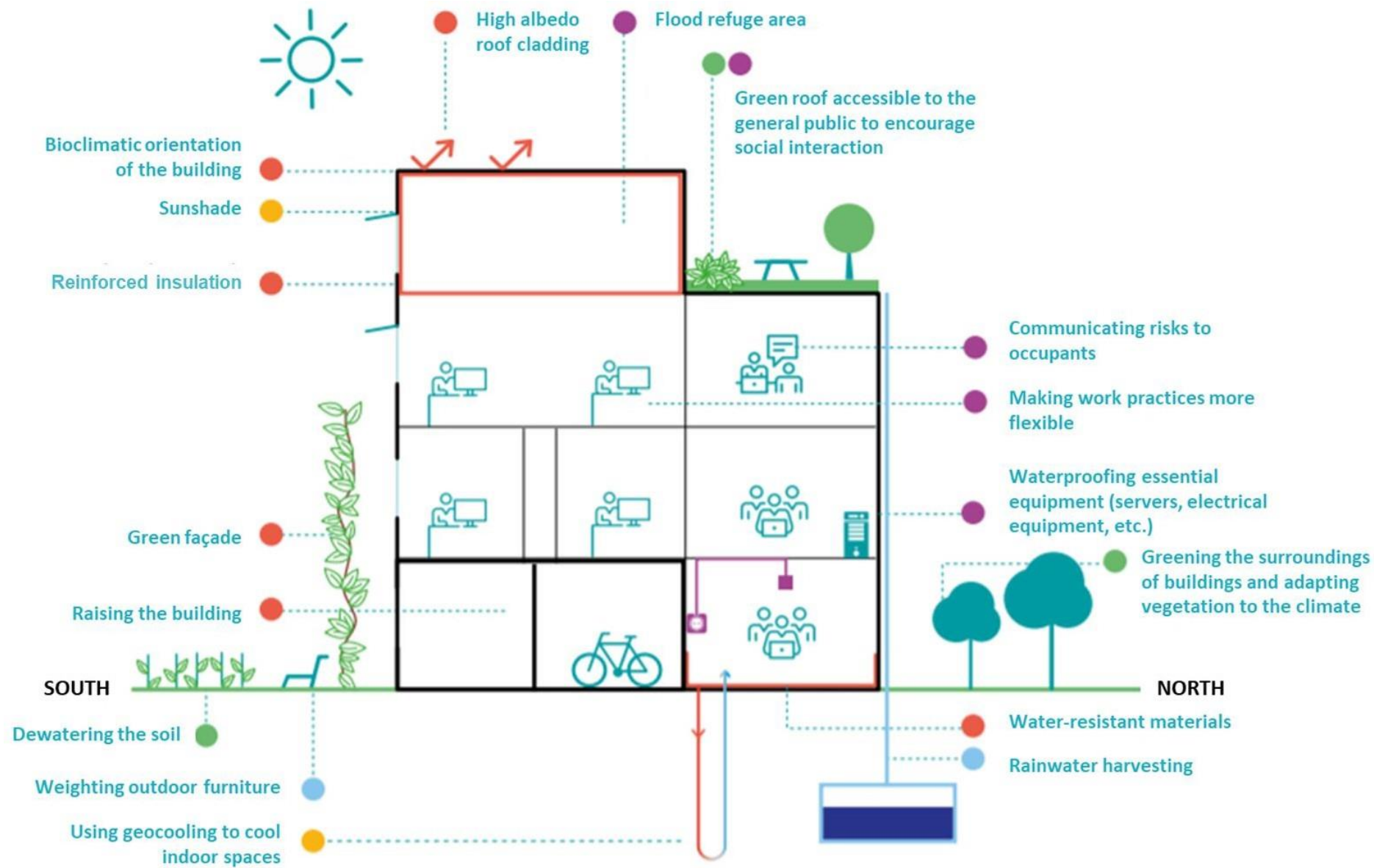
**MAKE TO ORDER SERVICES**



- ✓ Prefabrication
- ✓ 3D printing
- ✓ Mechanization



# RESILIENCE / ADAPTATION TO CLIMATE CHANGE





# HEALTH, SAFETY & WELLBEING

# BUILDINGS HAVE A KEY ROLE TO PLAY FOR HEALTH & SAFETY



Construction is the second sector with the highest risks of musculoskeletal disorders.



Release of hazardous substances during installation can lead to lung diseases.

## THE CHALLENGE

Reducing health risks for builders:

- respiratory diseases
- musculo-skeletal diseases

Both during construction & deconstruction.



As per WHO\*  
Time spent indoors



**125 million**  
additional people exposed to heat waves (2000-2015)

## THE CHALLENGE

- Deliver healthy indoor environments
- Improve occupants' comfort

# THE DRIVERS FOR MORE SUSTAINABLE BUILDINGS



## ENHANCED HEALTH & WELLBEING

### BETTER FOR PEOPLE



Health & Safety  
on jobsites



Health & Wellbeing  
indoors

- 7. Reduced builders' exposure to hazardous substances during installation
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# REDUCED OCCUPATIONAL RISKS FOR BUILDERS & INSTALLERS



## REDUCED BUILDERS' EXPOSURE TO HAZARDOUS SUBSTANCES

- No SVHC or CMR in the products
- Low level of VOC emissions and release of hazardous substances
- Non-hazardous waste



## IMPROVED WORKING CONDITIONS FOR BUILDERS

- Clean jobsites thanks to proper waste management
- Limitation of nuisances and pollution on the construction site
- Reduced risk of musculoskeletal disorders (MSD): light products, easy to handle
- Non-irritant and low dust products

*Builders' health and safety stand at the very heart of Saint-Gobain's approach. Safe jobsites are about reduced occupational risks for workers during all construction, renovation or deconstruction of buildings.*



# HEALTH & SAFETY FOR BUILDERS & INSTALLERS



- ✓ Low dust products
- ✓ Less itchy / soft touch
- ✓ Non irritant
- ✓ Lighter
- ✓ Less emissive
- ✓ Easy & safe to install products
- ✓ Product free of hazardous substances



# BETTER COMFORT FOR THE OCCUPANTS



## INDOOR AIR QUALITY

### INDICATORS:

CO<sub>2</sub> content in the air (ppm)  
VOC content in the air

- Fresh air supply / ventilation strategy
- Air tightness & moisture management
- Low-emissive products (VOCs)
- Active capture of indoor air pollutants



## ACOUSTIC COMFORT

characterized by an appropriate sound level and the absence of unwanted sounds.

### INDICATOR/

Equivalent sound pressure levels (LAeq, 15mn)

- Protection from noise (coming from outside or inside)
- Improved level of ambient noise
- Controlled noise reverberation and increased speech intelligibility



## THERMALCOMFORT

### INDICATOR:

% of time inside hydrothermal zone

- Design for comfortable thermal conditions (envelope, structure, servicing)
- Adapted to site-specific conditions (weather, microclimate conditions, etc.)
- Good thermal insulation



## ACCESS TO NATURAL LIGHT & OUTSIDE VIEWS

### INDICATOR:

% of daylight autonomy

- Transparent glass products
- Opaque interior products, which contributes to the distribution of daylight
- Active glazing that help manage glare, overheating or privacy
- Translucent products that show daylight whilst preserving privacy

# HEALTH & WELLBEING FOR THE BUILDING OCCUPANTS



Acoustic comfort, disturbance divided by 2: Ecophon ceilings



Indoor air quality<sup>1</sup>: Activ'Air plasterboard

Controlled hydrothermal comfort: Vario membrane



High performance glazing

- ✓ Comfort solutions
- ✓ Low emissive products New
- ✓ services (e.g. Kandü)





# TO CONCLUDE....

# THE DRIVERS FOR MORE SUSTAINABLE BUILDINGS



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Health & Safety on jobsites

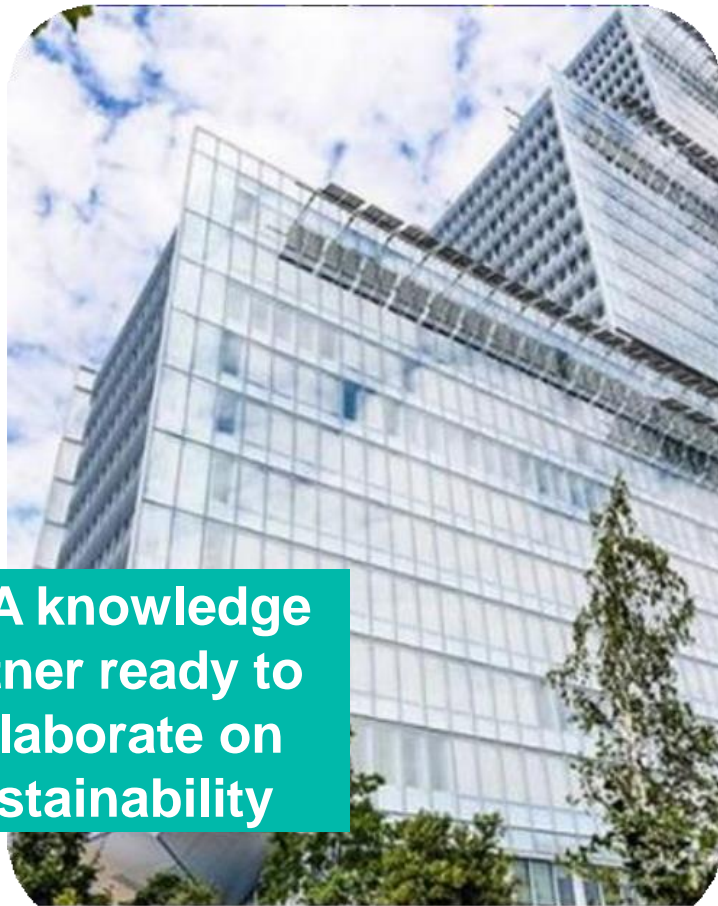


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# WORKING WITH SAINT-GOBAIN

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**A knowledge partner ready to collaborate on sustainability**



**A solution provider for sustainable building projects**