Saint-Gobain PAM
Soil & Drain

Our contribution to a sustainable habitat

PAM
SAINT-GOBAIN

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Introduction

33%
OF ENERGY CONSUMPTION

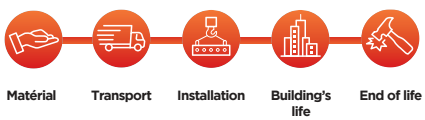
39%
OF GREENHOUSE GAS EMISSIONS

The construction industry's impact on the environment

Buildings have a huge impact on the environment: today it represents a third of energy consumption and GHG (Greenhouse Gas) emissions. A building impacts the environment This not only true for systems using energy during operational use (e.g. heating and cooling) but also for all materials throughout every stage of the life cycle including deconstruction of the building.

In summary, if we want to reach the Paris Agreement of 2°C:
> We need to optimize energy efficiency
> To switch from fossil to renewable energy supply
> And finally reduce the embodied carbon of the construction materials.

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

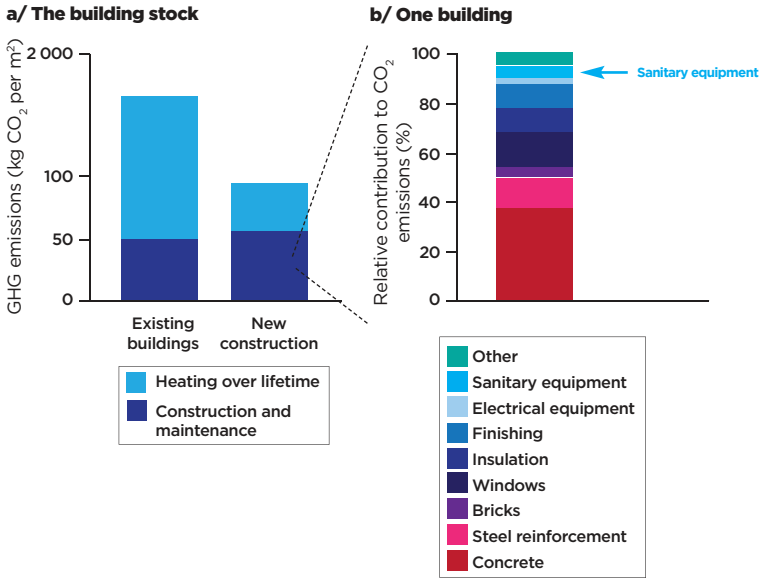


CO_2 contribution at building level

To have a better idea of how a building impacts the environment, we can have a look at its CO_2 emissions. Two recent studies from 2020 have made interesting analyses, explaining the contribution of each part of the construction.

In the 1st study, it is highlighted that the most contributive part is the structure made in concrete, among the most widely used materials: it represents about 40% of the CO_2 emissions for new construction. Owing to their large-scale use, production of cement and concrete results in substantial emission of greenhouse gases and places strain on the availability of natural resources, such as water.

At the same time, **calculations show that sanitary equipment (including drainage systems) represents a relative contribution of about 5%.**

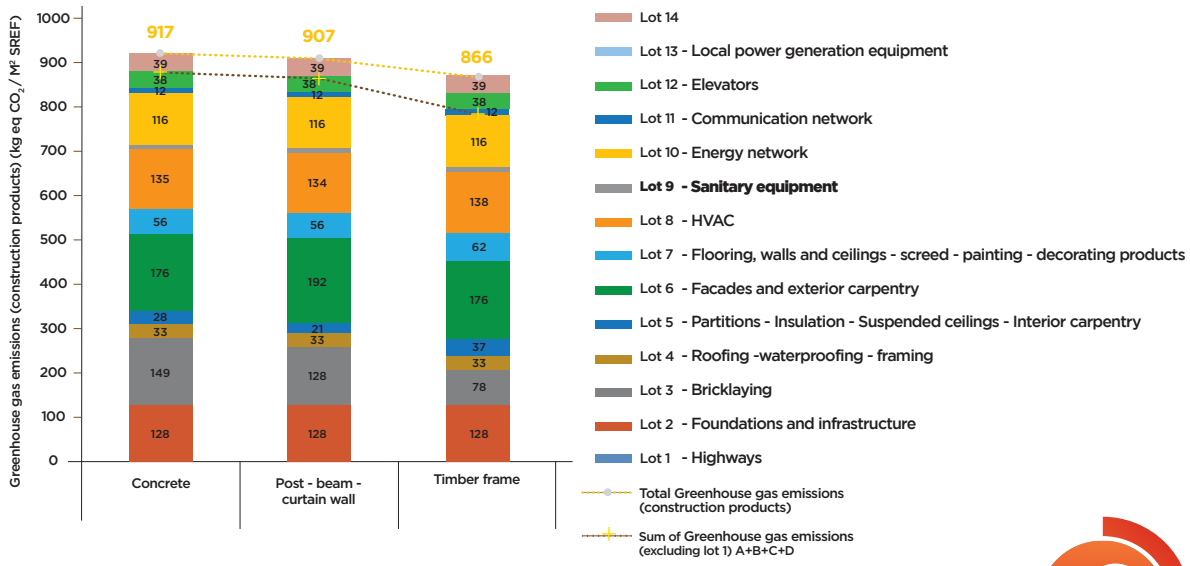


Source: Environmental impacts and decarbonization strategies in the cement and concrete industries, September 2020 – G. Habert, S.A. Miller, V. M. John,J. L. Provis,A. Favier,A. Horvath & K. L. Scrivener

The 2nd study comes from France where a life cycle analysis, commissioned by several building trade associations, has been made for a 4 storey office building (ca. 4000m²) in concrete, with external insulation: the results are quite similar, with a contribution between 30% and 50% for the concrete (foundation and structure).

In this study, **sanitary equipment** (calculated with standard values which are disadvantageous compared to verified values from manufacturers) **represents less than 5% of the total emissions**.

Greenhouse gas emissions (construction products) static in kgCO_2/ m² SU



Source: Sensitivity study on the RE 2020 regulatory calculation engine – Bastide Bondoux, Pouget Consultants, Tribu Energie

<5%

CONTRIBUTION TO CO_2 EMISSIONSOF THE SANITARY EQUIPMENTS AT BUILDING LEVEL

Saint-Gobain PAM Soil & Drain's commitments

Saint-Gobain initiatives Making the world a better home

What is sustainability for Saint-Gobain?

Together with **Performance**, Sustainability is one of the 2 key pillars in **Saint-Gobain's value proposition**.

Sustainability for Saint-Gobain is about **enhancing people's health and wellbeing** while **reducing the impacts on the natural environment**.

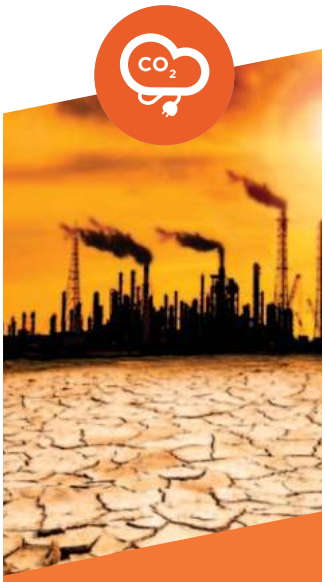
Sustainability is meant to address in priority **3 major trends** in our markets, our business environments and our economies:
- Carbon & climate
- Resources & circularity
- Health & well-being

We have the ambition **to make sustainability a key strategic driver for growth and differentiation**.

To curb the effects of climate change

Our group is a committed actor for the climate, aware that this challenge requires the cooperation of states, companies and civil society around a demanding international framework. In particular, we endorse the recommendations of the Task Force on Financial Disclosure (TCFD) we have been participating in Science-Based Targets (SBT) since 2018, and **we stand as a driver of the sustainable construction deployment through our participation in the Green Building Councils (GBC)**, a network of diverse actors working to create sustainable buildings that limit this sector's impact on the environment.

The new Saint-Gobain Tower is the only high-rise buiding in France to have obtained the 4 major international certifications with the best rankings.



-20% CO_2 emission
-15% energy consumption

-50%
non-recovered waste

-80%
industrial water release

Minimal impact on biodiversity

A group that is guided by a vision of a more sustainable world

At Saint-Gobain, we are working hard to help create an economy with as little environmental impact as possible. **By 2025, we have committed to reduce** (compared to 2010)**:**

> **our CO2 emissions by 20%,**
> **our non-recovered waste by 50%,**
> **our industrial water emissions by 80%.**

We have committed to reach net-zero emissions by 2050 in line with 1.5°C scenarios.

To achieve this ambition, we have set out new ambitious reduction targets for 2030:

> 33% reduction in scope 1 and 2 absolute emissions from a 2017 baseline
> 16% reduction in scope 3 absolute emissions from a 2017 baseline.

Developing eco-innovation

Life cycle assessments are conducted for all of Saint-Gobain's building industry product families in order to measure their environmental footprint. The assessments enable Saint-Gobain to target environmental impacts of its products in order to reduce it while also creating value.
A culture of eco-innovation is being extended to all the Group's businesses, in all its markets.

The Group is also working on reducing the environmental footprint of its industrial processes. Similarly, special attention is paid to product recycling. Concerning the shipping of materials, Group researchers are using their skills to develop models for more efficient and environmentally friendly shipping processes.

Saint-Gobain PAM Soil&Drain achievements (CO_2 – Water – Waste)

As part of Saint-Gobain we have implemented all key elements of the group's strategy within our business. Thanks to the strategic choices and investments within our Bayard and Telford plants we have already made great progress.

Bayard's plant (2019 compared to 2010)

-13% **-50%** **-72%**

Focus on water: recent renovation of our water recovery basin in Bayard's plant

It is a substantial but environmentally beneficial project, which was completed in 2020 at the Bayard site. The works included the waterproofing of both the lagoons and water recovery basins.

Once the waterproofing of the basins was complete, a pipe was installed to send the water from the lagoons to the pump room supplying the casting machines. Finally, the last stage consisted of evacuating the soil to an approved center.

The benefits of this work are twofold: it considerably reduces the site's water consumption **(we aim to halve the water consumption thanks to this), and it also guarantees the preservation of our environment and the quality of the water tables**. They are in line with the sustainable development actions already carried out by our team at Bayard.

Telford's plant (2019 compared to 2010)

-84% **-100%** **-86%**

Focus on CO_2 : the choice of a 100% renewable power sourcing

Our plant in Telford made the choice to contract with the supplier SmartestEnergy in 2015, procuring us **100% renewable electricity for our electric furnace**.

Saint-Gobain PAM's certifications

For Saint-Gobain PAM, being committed to sustainable development actions by ensuring its plants' full compliance with current regulations is just the start.

Plants in the metallurgical industry call for greater vigilance and strict compliance with instructions, as the risks of serious accidents are particularly high.

The comprehensive approach adopted led us to obtain first the ISO 14001 and 50001 certifications for our plants but also recently BES 6001 for Telford's site.

ISO 14 001

Scope: Our plant where we have the majority of our environmental impacts

What is it?
Environmental risk management system

Which means ...
We have a policy, we monitor our impacts and put in place action plans for continuous improvement and we have an annual audit.

ISO 50 001

Scope: Our plant where we have the majority of our energy consumption and CO_2 emissions.

What is it?
Energy management system

Which means ...
We have a policy, we monitor our impacts and set up action plans with objectives and we have an annual audit.

BES 6001

Scope: the production site where most of our environmental impacts reside.

What is it?
Certifiction in Responsible Sourcing of Construction products

Which means ...
All of our suppliers are required to sign our Procurement and Suppliers' Charter ensuring they are similarly committed to responsible procurement.

A transparent approach: Safe products & Life Cycle Assessment

Safe products

How to assess the impact of a material on the human health with the REACH regulation?

REACH stands for Registration, Evaluation, Authorization and Restriction of Chemicals.
It is a European regulation (EC 1907/2006) that aims to improve the protection of human health and the environment through the better and earlier identification of the intrinsic properties of chemical substances. This is done by the four processes of REACH, namely the registration, evaluation, authorization and restriction of chemicals.

Manufacturers and importers are required to gather information on the properties of their chemical substances, which will allow their safe handling, and to register the information in a central database in the European Chemicals Agency (ECHA)

If the risks cannot be managed, authorities can restrict the use of substances in different ways. The Regulation calls for the progressive substitution of the most dangerous chemicals (referred to as "substances of very high concern") when suitable alternatives have been identified.

To comply with the regulation, companies must identify and manage the risks linked to the substances they manufacture and market in the EU.

https://ec.europa.eu/environment/chemicals/reach/reach_en.htm
https://echa.europa.eu/regulations/reach/understanding-reach

What can we say regarding Saint-Gobain PAM Soil & Drain products?

None of the substances in the Authorization List, Restriction List and Substance of Very High Concern (SVHC) Candidate List are intentionally included in pipes in amounts greater than 100 ppm w/w.
It's possible to provide a REACH Declaration for Saint-Gobain PAM products.

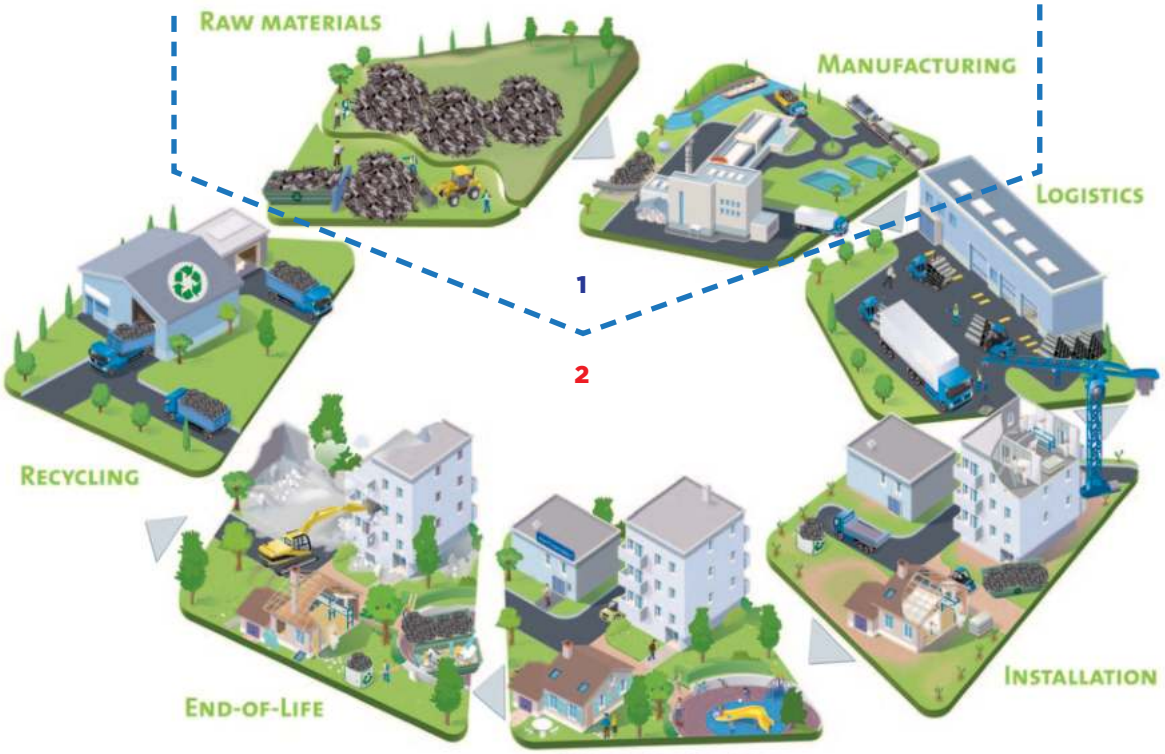
Life Cycle Assessment: a rigorous tool for assessing the environmental impacts of our products

Understanding the environmental performances of construction products is a growing expectation for professionals in the building chain.

In Saint-Gobain PAM Soil & Drain, we strongly believe that Life Cycle Assessment is the most reliable tool available to assess the green credentials of construction products and enables companies to communicate credible, fact-based information about their products to consumers. It is also a powerful tool for enhancing the environmental features of our products.

LCA is a methodology based on specific standards ISO 14040 and ISO 14044:

- Multi-criteria tool: consumption of natural resources, air, ground and water emissions, waste generation, warming potential, ...
- Multi-step tool: "cradle to gate" or "cradle to grave".



1 - CRADLE TO GATE
2 - CRADLE TO GRAVE

Scope cradle to grave, what does it mean?

It defines the system boundaries of the study. The assessment starts from the extraction of raw material and continues through to end-of-life including all the intermediary stages: Transportation of raw material to the plant, Manufacturing process, Distribution, Installation and use.

At Saint-Gobain PAM Soil&Drain we have chosen the cradle to grave approach.

Environmental Product Declaration

What is an Environmental Product Declaration?

The results of a LCA are presented in the form of an Environmental Product Declaration, locally administrated by program operators and based on ISO 25930 and EN 15804 standards. When an EPD has been checked by an independent third party, it is said to be verified. This process ensures the quality and reliability of the results: that is why we are committed to have verified EPDs.

We currently have produced and verified EPDs for our S and Plus ranges, both available on the Environdec platform : www.environdec.com

Overview of the EPD for our S range

The table below presents a part of the environmental indicators results. The table enables a quick and synthetic overview of environmental footprint of **the functional unit (1 m of Saint-Gobain PAM SMU S cast iron pipe system** for collection and drainage of waste water, sewage and rainwater in buildings), based on **70 years of lifetime**. The complete EPD is available on the international Environdec platform, registration number S-P-02013.

Source: https://www.environdec.com/Detail/?Epd=18393

"Did you know that Saint-Gobain PAM Soil & Drain is the 1st EPD provider for DRAINAGE SYSTEMS in CAST IRON?"

Circular economy: recyclability, an exceptional asset of cast iron

SAINT-GOBAIN PAM, A KEY PLAYER IN THE CIRCULAR ECONOMY

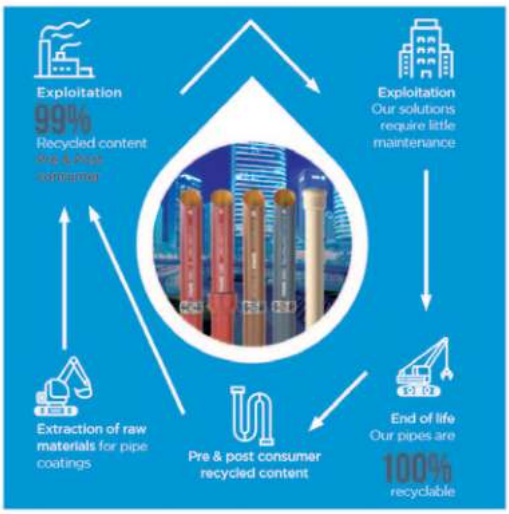
The preservation of natural resources is a major societal challenge, especially for the construction sector, which is a major consumer of raw materials and energy. Saint-Gobain PAM evacuation systems are a responsible and sustainable choice, respectful of natural resources and people.

A cast iron pipe gives our waste a second life

In order to contribute to the preservation of natural resources, Saint-Gobain PAM's molten iron is produced by recycling cast iron and ferrous products. Unlike plastics, it can be completely and systematically recycled at the end of its life.

Saint-Gobain PAM's drainage solutions can be recycled without any deterioration of their properties.

The product's life cycle is also first-class in terms of environmentally-friendly logistics, long-lasting functionality (up to 70 years without compromising the mechanical properties), low maintenance costs and commercially beneficial recycling.



100% recyclable indefinitely without losing any of its properties and made from 99% recycled content*

For the standard S range, recycled content is 99% with 11.5% pre-consumer** & 87.5% post-consumer*** according to ISO 14021: 1999.

Nothing is wasted: everything is recycled

Cast iron pipe systems are based on the principle of modular ranges of removable components. Their mechanical assemblies are reversible.

You can change your mind today or even tomorrow. When pipe systems are disassembled or modified, these components can be reused, which cuts down on waste dumping.

*Recycled content: proportion, by mass, of recycled material in a product or packaging. Only pre-consumer and post-consumer materials shall be considered recycled content.
** Pre-consumer material: material diverted from the waste stream during a manufacturing process. This excludes the reuse of materials such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it.
*** Post-consumer material: material generated by households or commercial, industrial and institutional facilities in their role as end users of the product which can no longer be used for its intended purpose.

Organised and numerous actors in the recycling channel

The recycling channel exists: **collector network and recovery stream is existing and working!**

We work with local supply for scrap (<125 km from the plant) to reduced economic and transport costs.

Following ISO 14021:1999 and LEED V4 criteria we can provide a recycled content declaration for our products, such as:

Recycled content declaration
S range drainage system

We declare that the percentage of scraps included in the composition of drainage solution (pipes andfittings), manufacturedby Saint-Gobain PAM Soil&Drain is the following:

pre-consumer content	11,5 %
post-consomer content	87,5%

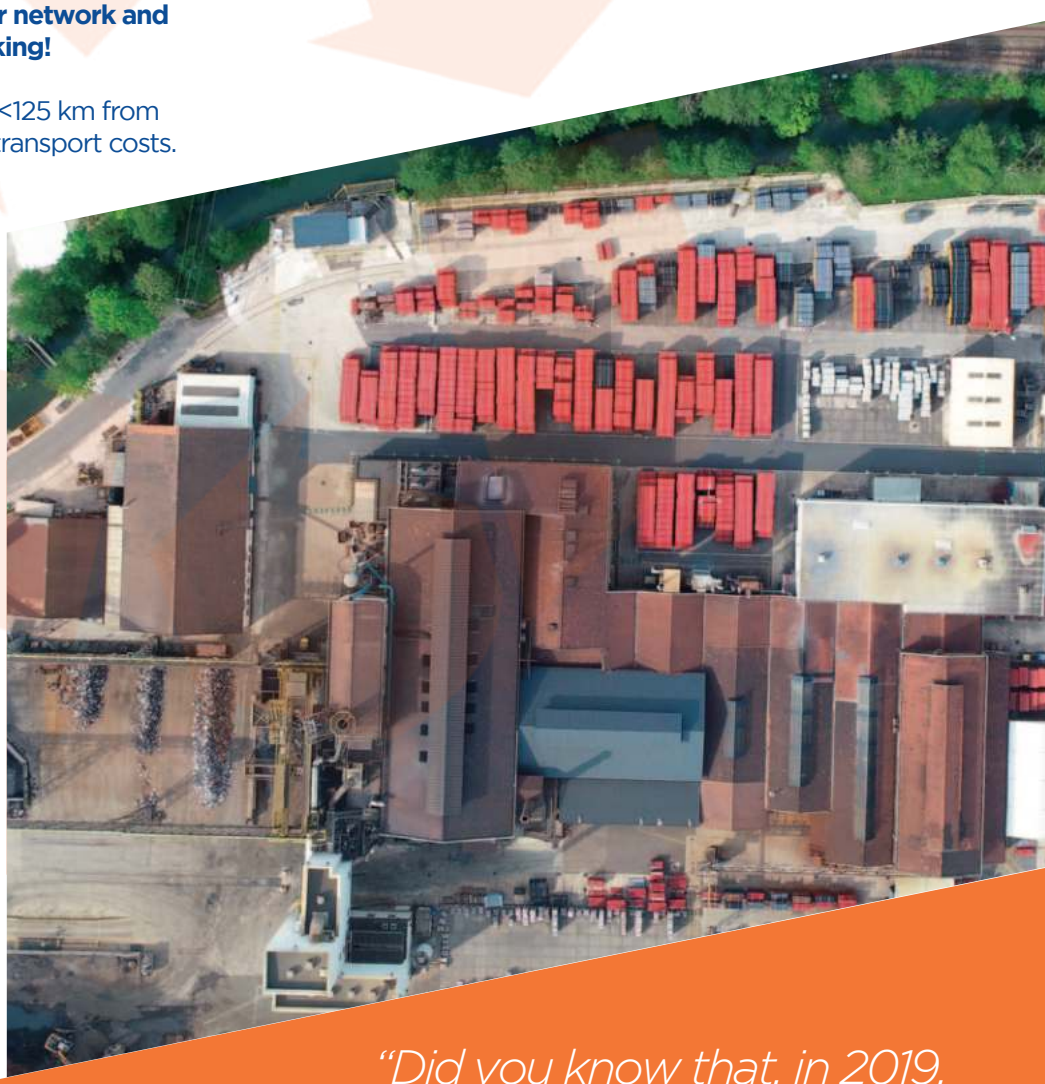
Following ISO 14021:1999, the recycled content is 99% by weight:

Recycled content (ISO 14021:1999) = post-consomer content + pre-consumer content

Following LEED v4 "Building product disclosure and optimization - sourcing of raw materials" criteria, the recycled content is 93% by weight:

Recycled content (LEED v4) = post-consumer content +1/2 pre-consumer content

October 2020
SAINT-GOBAIN PAM, Soil&Drain



*"Did you know that, in 2019, we have recycled the equivalent of 18.300 cars**

** following the average weight of cars sold in France in 2019 (source ADEME)*

Focus on a recent initiative: Recycling of the old Parisian drinking water network in our Bayard plant

The Parisian drinking water network pipes is principally made of cast iron from different technological developments since the 19th century and located in the sewer galleries.
The old cast iron pipes dating from before the beginning of the 20th century are coated with a coal pitch coating. During their renewal, they need to be evacuated to a specific treatment area for coal pit residues.
A recycling service for old cast iron pipelines has been developed in our Bayard's plant in order to meet the environmental requirements of Eau de Paris 1st public company of water in France).
Several pilot projects have validated the sector from a technical and organizational point of view and considered the industrialization of pipe recycling.

The main stages of the recycling process for old cast iron pipelines

Pipes before removal

Storage of old and new pipes

Use of return flow

Bayard plant

Reflections in the cupola at the Bayard plant

Production of new pipes for drainage system

Contribution of PAM drainage solutions to green building labels

What is a sustainable building?

Better buildings for better living

The building sector has a strong potential to help protect the environment and increase life comfort and wellbeing.

Sustainable buildings meet the challenges of the **three sustainability pillars (People, Planet, Profit)** throughout their entire lifecycle. At every stage, a building designed, built or renovated in a sustainable way helps to improve comfort and wellbeing, minimize the consumption of natural resources including energy, reduce the environmental footprint and improve the project's financial viability.

Buildings and construction works have the largest single share in global resource use and pollution emissions.

Demand for sustainable buildings is rising and this can notably be seen through the development of building ecolabels all over the world. The number of certified m^2 has been increasing a lot over the past 10 years to achieve **in 2019 a total of 1,24 billion m^2 certified by GBC's members** (see below).

The building chain is moving towards more sustainable construction. Most architects, engineers, contractors, owners and consultants worldwide anticipate that a huge proportion of their work will be "green" in the future, and this is not restricted to a geographic area or level of development. Stakeholders have numerous expectations and the market demands evidence of alleged "sustainable" performance. Organizations such as the **World Green Building Council (WGBC)** are helping to accelerate the pace, in both mature and emerging countries. With over 100 countries, the WGBC is the largest international organization striving to move the market forward.

Standards, policies and regulations are developing with an **increasing emphasis on the "lifecycle approach"** designed to consider the whole building lifecycle:
from the raw material extraction to deconstruction and recycling.

WORLD GREEN BUILDING COUNCIL

LEED certification:

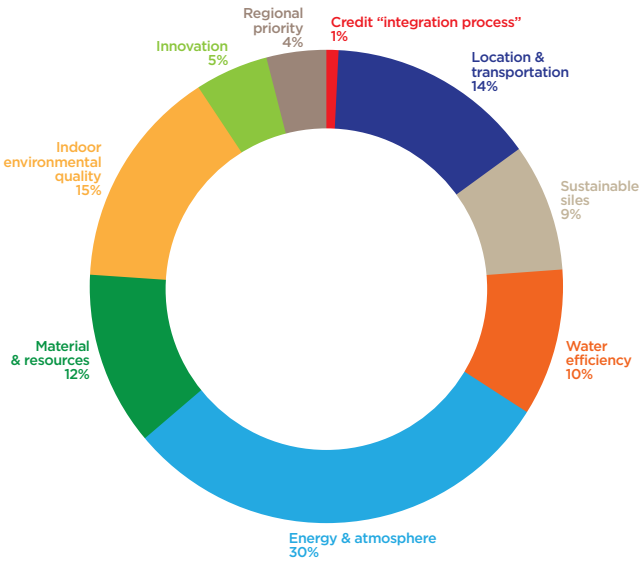
Leadership in Energy and Environmental Design (LEED) is an American green building certification program. To be LEED certified, building projects have to meet certain prerequisites and earn points to achieve different levels of certification. The prerequisites and credits differ for each rating system, depending on the type of building (office, school, home ...) and the type of project (new, renovation...).

> Scope

LEED® certification looks at the entire life cycle of a green building, its design, its construction and its operations. 8 issues are covered: Integrative Process, Location and Transportation, Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, Innovation and regional priority.

> LEED Scorecard (LEED V4)

LEED points are awarded on a 110-point scale (still on the BD+C version), and credits are weighted among themselves to reflect their potential sustainability impacts.



LEED Categories	Possible points	Weighting
Credit "integrative process"	1	1%
Location & transportation	16	14%
Sustainable siles	10	9%
Water efficiency	11	10%
Energy & atmosphere	33	30%
Material & resources	13	12%
Indoor environmental quality	16	15%
Innovation	6	5%
Regional priority	4	4%
Total	110	100%

> Ranking system

Some of the credits are considered as prerequisite and need to be fulfilled to reach the label. For the other credits, the minimum number of points to be LEED certified is 40. Higher levels of compliance are possible leading to different rankings, as shown in the table below.

LEED ranking	LEED points
Certified	40-59
Sliver	50-59
Gold	60-79
Platinum	> 80

SOURCE: https://www.greenbuilding.saint-gobain.com/leed-v4

> Saint-Gobain PAM Soil&Drain contribution to LEED certification - V4.1 - BD + C
(Building Design & construction)

LEED categories		Up to		Contribution
INTEGRATIVE PROCESS	Integrative process	1 point	◎	1- We developed adigital tool to support the design phase of the project and deliver a pre-study. 2- BIM Object for our products are at your disposal.
SUSTAINABLE SITES	Heat Island Reduction	2 points	◎	**Option 1 - High-reflectance roof and vegetated roof:** Our Saint-Gobain PAM Soil&Drain's systems are compatible with green roof solutions and roofs using high-reflectance materials.
WATER EFFICIENCY	Outdoor water use reduction	3 points	◎	**Option 2** - Reduced irrigation: Saint-Gobain PAM's Soil& Drain's systems helps to harvest rainwater thanks to its pipes for rainwater application. It contributes to the option by providing an alternative water source.
	Indoor water use reduction	7 points	◎	Thanks to its systems compatible with water tanks, we could contribute to reuse reclaimed water.
ENERGY	Indoor water use reduction	Required	◉	Contribution for **ELIXAIR** product for this criteria: the Saint-Gobain PAM Soil&Drain's Canadian well contributes to the energy performance of the building for summer and winter comfort by limiting the energy needs for air conditionning and heating in the building.
	Optimize energy performance	18 points	◉	Contribution for **ELIXAIR** product for this criteria: Earth to air heat exchanger system permits to heat or cool air in buildings. It's a passive system and doesn't need any energy to operate. It also helps to reduce the energy needs for air conditionning and heating.
MATERIALS & RESOURCES	Construction and demolition waste management planning	Required	◉	We are committed to circular economy. It offers pipes that are 100% recyclable, which contributes to divert waste on construction or deconstruction jobsites. It's not only in theory as the recycling channel for cast iron is existing already on the market. PAM also has the possibility to recover pipes for reusing. To close the loop, our pipes are produced with 99% recycled content. This asset is more related to the following criteria: Building product disclosure and optimization - Sourcing or raw materials criteria.
	Building life-cycle impact reduction	5 points	◎	**Option 4:** We performed 2 Life Cycle Assessments (LCAs) cradle-to-grave for Global market covering S and l Plus ranges, which help to contribute to the option 4 'Whole-building life-cycle assessment'.
	Building product disclosure and optimization Environmental Product Declarations	1 point	◉	**Option 1:** Saint-Gobain PAM Soil&Drain's is th first cast-iron building pipe manufacturer to perform Life Cycle Assessments (LCAs), and provide a third party verified, cradle-to-grave, complied with EN 15804 and ISO 14025 EPD. It's product specific Type III EPD and covers S and Plus range. Its will help you to gather 20 different EPD from different manufacturers.
	Building product disclosure and optimization - Sourcing of raw materials	1 point	◉	Extended producer responsibility - Saint-Gobain PAM belongs to Saint-Gobain Group, which is commited to CSR through the Global Compact and its internal policies for example Biodiversity, Health, Energy, Circular Economy and sustainable resources management policies. Saint-Gobain has also a Responsible Procurement policy: a charter, an evaluation and social audits to ensure good practices among suppliers. Finally, our products are recycled at the end of their life through the cast iron recycled channel. Material reuse - Due to a long-lasting performance of our products, material reuse is theoretically possible. Recycled content - Recycled cast-iron is considered to be a secondary aggregate and pipes are made of 99% of recycled cast iron, all from post-consumer supply. Sourcing - Raw material soucing is not further than 160 km (100 miles).
	Building product disclosure and optimization - Material ingredients	1 point	◎	**Option 1 Material Ingredient Reporting:** Saint-Gobain Group has the internal knowledge to disclose an HPD on-demand, we we rather contribute to the option 2. **Option 2 Material Ingredient Optimization** International Alternative Compliance Path - REACH Optimization: None of the substances in the Authorization List-Annex XIV, Restriction List-Annex XVII and Substance of Very High Concern (SVHC) Candidate List are intentionally included in our products in amounts greater than 100 ppm w/w.
	Construction and demolition waste management	2 points	◎	**Option 1:** When there are some construction or deconstruction waste on jobsite, it's directly recycled by the recycling channel that already exist for cast iron. It's part of the diverted waste targeted in this criteria. **Option 2:** Waste generation for Saint-Gobain PAM Soil & Drain's pipe on jobsite are close to zero - 5%. It's part of a onsite waste minimization design strategy.
INDOOR ENVIRONMENTAL QUALITY	Acoustic performance	1 point	◉	Acoustic tests prove that our drainage solutions in cast iron attenuate noises happening in buildings thanks to its exceptional accoustic performance. These tests allow to enter the ranges of the prerequisites of the table listed in the criteria.
INNOVATION	Innovation	5 points	◎	The pre-assembly workshop in UK helps to minimize the work runtimes onsite and ease the installation and handling.

◉ Major contribution ◎ Minor contribution

BREEAM certification:

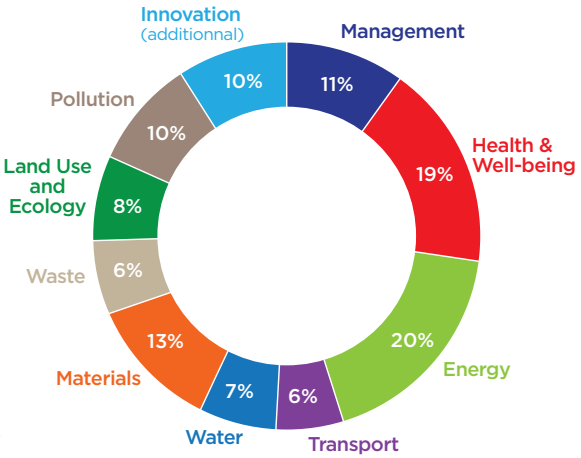
Building Research Establishment's Environmental Assessment Method (BREEAM) is the world's longest established method of assessing, rating and certifying the sustainability of buildings. It is an international standard that can be locally adapted. The assessment process evaluates the procurement, design, construction and operation of a development against targets that are based on performance benchmarks. The measures used represent a broad range of categories and criteria from energy to ecology including health & well-being. Within every category, developments score points – called credits – for achieving targets, and their final total determines their rating.

> Scope

Several schemes exist within the BREEAM Family:
> According to the lifecycle stage/project type
> According to the country

> BREEAM Scorecard

BREEAM International New Construction 2016 comprises 10 assessment categories (management, health & wellbeing, energy, transport, water, materials, waste, land use & ecology, pollution and innovation) and credits are awarded in these categories based on the performance of the building assessed:



**Each of the above categories is 'weighted' differently and in addition there is an adaptation of weightings for local conditions.*

SOURCE: https://www.greenbuilding.saint-gobain.com/breeam-2016-international

> Ranking system

Credits are then aggregated to produce a single overall score on a scale of Pass, Good, Very Good, Excellent and Outstanding. The number of credits and percentage scores vary to a degree between schemes as they relate to the opportunities that exist within that sector and life cycle stage but as an example, a project assessed under BREEAM International New Construction 2016 can achieve up to a maximum of 140 credits; Innovation provides opportunities for up to 10 bonus credits.
But the minimum percentage to be BREEAM certified is 30%. Higher levels of compliance are possible, leading to different rankings, as shown in the table below.

BREEAM rating	% Score
Unclassified	< 30 %
Pass	≥ 30 %
Good	≥ 45 %
Very good	≥ 55 %
Excellent	≥ 70 %
Outstanding	≥ 85 %

> Saint-Gobain PAM contribution to BREEAM certification - 2016 International New Construction

LEED categories			Up to		Contribution
HEALTH & WELL-BEING	Hea 05	Acoustic performance	5 credits	◉	Acoustic tests prove that Saint-Gobain PAM Soil&Drain's solutions attenuate noises happening in buildings thanks to its exceptional accoustic performance. These tests allow to enter the ranges of the prerequisites of the table listed in the criteria.
ENERGY	Ene01	Reduction of energy use and carbon emissions	15 credits	◉	Contribution for **ELIXAIR** product for this criteria: our Canadian well contributes to the energy performance of the building for summer and winter comfort by limiting the energy needs for air conditionning and heating in the building. It helps to reduce operational energy demand, primary energy consumption and CO2 emissions.
	Ene04	Low carbon design	3 credits	◉	Contribution for **ELIXAIR** product for this criteria: Earth to air heat exchanger system offers by Saint-Gobain PAM Soil&Drain permits to heat or cool air in buildings. It's a passive system and doesn't need any energy to operate. It helps to reduce the overall building energy demand.
MATERIALS	Mat 01	Life cycle impacts	6 credits	◉	Saint-Gobain PAM Soil&Drain is the first cast iron building pipe manufacturer to perform Life Cycle Assessments (LCAs), and provide a third party verified, cradle-to-grave, complied with EN 15804 and ISO 14025 EPD. It's product specific Type III EPD and covers S and Plus ranges. Its will provide you LCA indicators of one of the building elements. You could complete an additional credit by providing our EPD.
	Mat 03	Responsible sourcing of construction products	4 credits	◎	**Sustainable procurement plan:** Saint-Gobain PAM belongs to Saint-Gobain, which has a Responsible Procurement policy. Indeed, there are a charter, an evaluation and social audits to ensure good practices among suppliers. It is ensuring responsible sourcing of construction products through the whole supply chain. **Responsible sourcing of construction products:** 100% of our plants are certified ISO 14001. Telford's plant got also the BES6001. These two schemes are recognised by BREEAM methodology and will ensure a more responsibly sourced materials.
	Mat 06	Material efficiency	1 credit	◎	Due to a long-lasting performance of our products, material reuse is theoretically possible. Recycled cast-iron is considered to be a secondary aggregate and pipes are made of 99% of recycled cast iron, all from post-consumer supply. Waste generation for our drainage solutions on jobsite are close to zero, around 5%.
WASTE	Wst 01	Construction waste management	3 credits	◉	In order to contribute to resources efficiency, cast iron waste are recycled waste which help to divert waste from landfill, and not only in therory as the channel already exist.
	Wst 05	Adaptation to climate change	1 credit	◎	By delivering solutions compatible for rainwater harvesting, high reflectance and vegetated roofs, Saint-Gobain PAM Soil&Drain provides a solution to adapt to climate change.
	Pol 03	Surface water run-off	5 credits	◎	Our systems helps to harvest rainwater thanks to its pipes for rainwater application. It contributes to reduce the discharge of rainfall to public sewers, and provide an alternative water source for irrigation.
INNOVATION	Inn 01	Innovation	10 credits	◉	The pre-assembly workshop in UK helps to minimize the work runtimes onsite and ease the installation and handling.

◉ Major contribution ◎ Minor contribution

Environemental labelled building references with Saint-Gobain PA

Palladium Tower – Turkey
> Offices + shopping mall

ALTO Tower - France
> Offices

Saint-Gaobain Tower – France
> Offices

Akasya – Turkey
> Residence + shopping mall

42 Maslak – Turkey
> Offices

AM's drainage solutions

XIQU Center - Hong Kong
> Concert Hall

Tanjong Pagar Center (Guoco Tower)
Singapore
> Offices

Other references

FRANCE & UK

HIGH RISE BUILDING

> **ERIA Tower – France**
  • Offices - BREEAM/HQE
> **Trinity Tower - France**
  • Offices - HQE exceptionnel/ BREEAM excellent
> **Victoria Square redevelopment - UK**
  • Hotel, retails, restaurants, apartments - BREEAM very good

NON RESIDENTIAL

> **HCA Hospital Birmingham - UK**
  • Healthcare BREEAM very good
> **National Children's hospital Dublin - Ireland**
  • Healthcare - BREEAM excellent
> **21 Moorfields London - UK**
  • Offices - BREEAM outstanding
> **Origine building - France**
  • Offices - E+C-/BREEAM/LEED/WELL

TURKEY

HIGH RISE BUILDING

> **Nidakule Goztepe – Istanbul**
  • Offices - LEED Gold
> **Prokon-Ekon Merkez Binasi – Ankara**
  • Offices - LEED Platinium
> **Is GYO & Sisecam Tuzla – Istanbul**
  • Offices - LEED Gold

RESIDENTIAL

> **Soyak Soho – Istanbul**
  • Appartments - LEED Gold

NON RESIDENTIAL

> **Kartal Lutfi Kirdar Hastanesi – Istanbul**
  • Healthcare - LEED Gold
> **Emaar Square AVM – Istanbul**
  • Shopping mall - LEED Gold
> **Piri Resi Universitesi Tuzla - Istanbul**
  • Education - BREEAM Very Good

APAC

HIGH RISE BUILDING

> **Thamrin 9 Tower 1 - Indonesia**
  • Offices, appartments - Green Mark Platinium
> **Grosvenor Hong-Kong**
  • Appartments - LEED Gold Renovation

NON RESIDENTIAL

> **The Jewel Changi - Singapore**
  • Airport - Green Mark Gold Plus
> **Ocean Park Marriott Hotel - Hong-Kong**
  • Hotel - BEAM Plus Gold

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