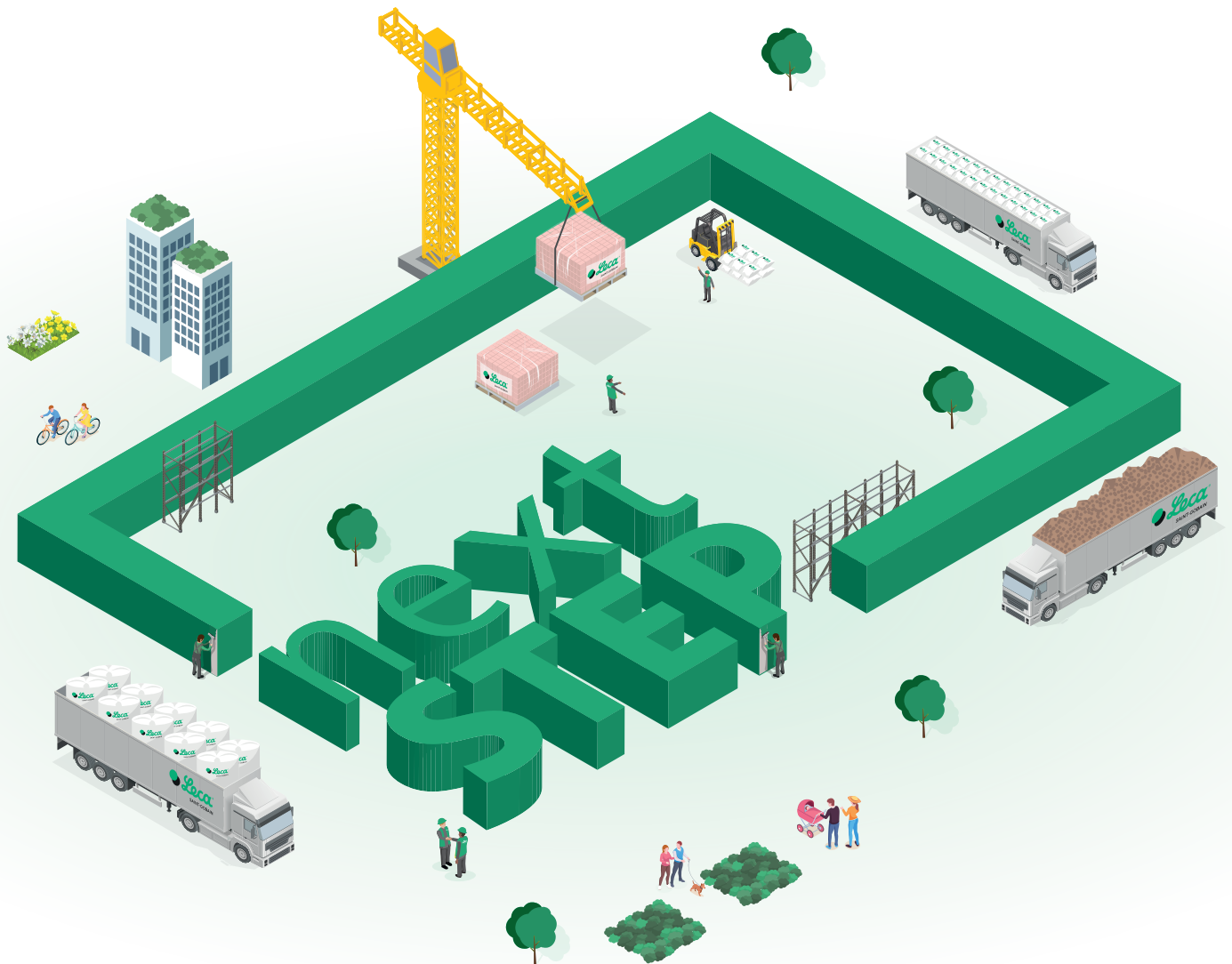


# What if our NEXT STEP had a new Focus?

## Introducing our Sustainable journey

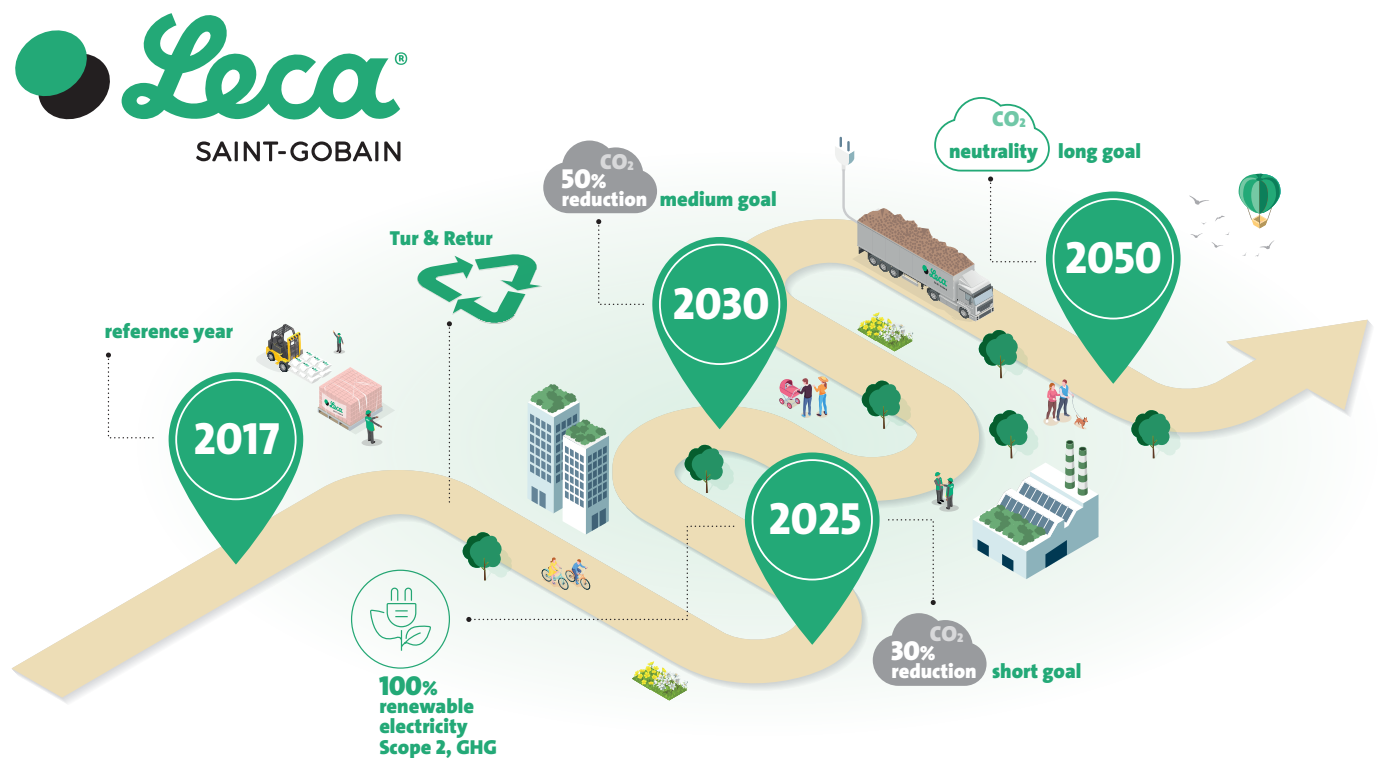


# Focus on the environment

Our goal is to be part of the solution to a problem affecting the entire world - how do we guarantee a sustainable future? Being part of the sustainable construction's solutions. To achieve this milestone we are investing in environmentally friendly forms of energy in our operations, we can reduce the use of fossil fuels. In accordance with life cycle thinking, our product is long-lasting, durable, safe and, above all, reusable in many ways.

Curbing climate change and adapting to it requires concrete change from the construction industry. The change is not easy, and not all the steps are clear yet, but the joint journey must start today. Everyone must do their part to ensure a sustainable future for all of us.

Are you ready to take the next step with us?



## Welcome aboard

# Improving living conditions and protecting the environment

Our products are bringing a number of advantages to the construction market, within the housing, infrastructure and water management sectors. They cater for comfort and wellbeing through positive thermal and acoustic insulation within our homes and living spaces.

We also see the benefits for our products within infrastructure design creating load compensation, reduced load on structures and offering effective drainage properties. Furthermore, we see the positive impact our products on the work environment and transport due to its unique combined lightness and strength. Our products are often recognized as achieving more with less.

Our organizational ethos of sustainability and protecting the environment is more than the effective engineering results of specifying our products – it is also what we do in our manufacturing processes. We recognize the environmental impact generated within our industry and we are focused on improving our environmental footprint through consistent optimization within all industrial processes throughout the total life cycle of our products.

But we do not rest on laurels on where we are today, we have clear plans of where we want our industry to be tomorrow. Reducing our industrial CO<sub>2</sub> footprint by 50% by 2030 is only our initial goal, we want to go beyond this. And LECA sustainability is much more than CO<sub>2</sub> footprint and that is why we are developing transparent information on the full life cycle of our products.

We use energy to expand our aggregate but we are looking at the benefits in the total life cycle of our product – accounting for all the benefits generated during transport, installation and the user phase we believe we go far beyond the basic energy consumed to produce our products.

Through assessing the life cycle of our products it is clear that we are producing a building material for a sustainable construction. And importantly, not forgetting the end of the life-cycle of our lightweight aggregate, which can be removed and simply reused in the future, thanks to the material's unique and highly sustainable properties.

LECA® LWA is a product of today, with a strong history, and fully prepared for the needs and challenges of tomorrow. We want to take an active part in a sustainable future through our next steps.

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**Kim Rosenbom**  
Sustainability & Business  
Development Director

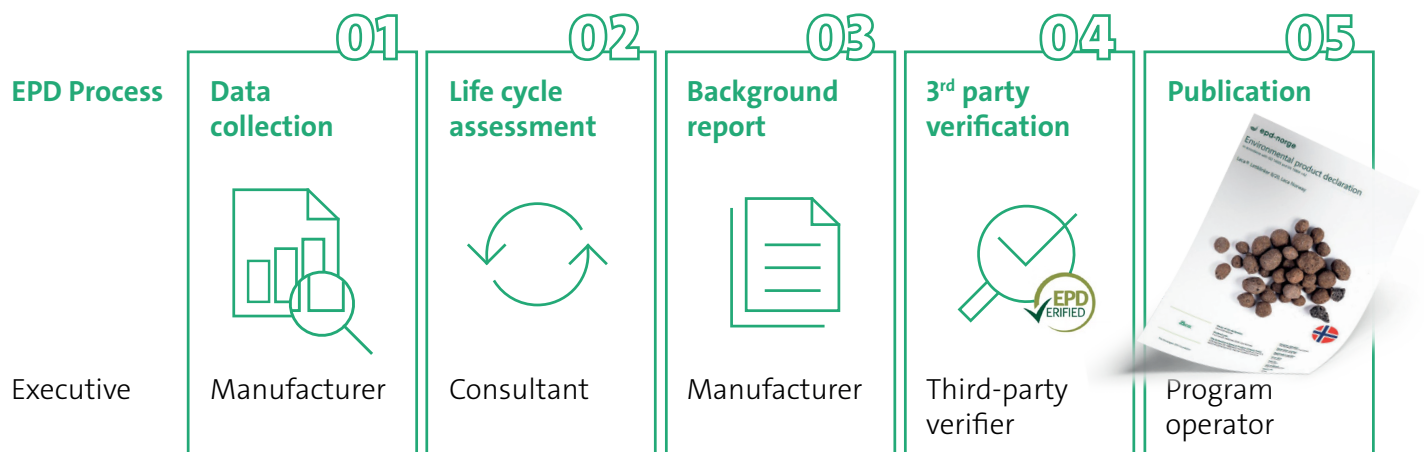
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# Focus on the environment

LECA has a strong commitment to the environment. Every day we extract clay from nature to produce our main product, Leca® LWA (Lightweight Aggregate). Even if we transform 1m³ of clay into 5m³ of sustainable construction material it is fundamental for us to understand the full life cycle impact of our products.

Therefore, we are working on the Life Cycle Assessment (LCA) of our products which will allow us to generate the Environmental Product Declarations (EPDs) – a transparent way to present the cradle to grave information for all our products, from all our production sites.

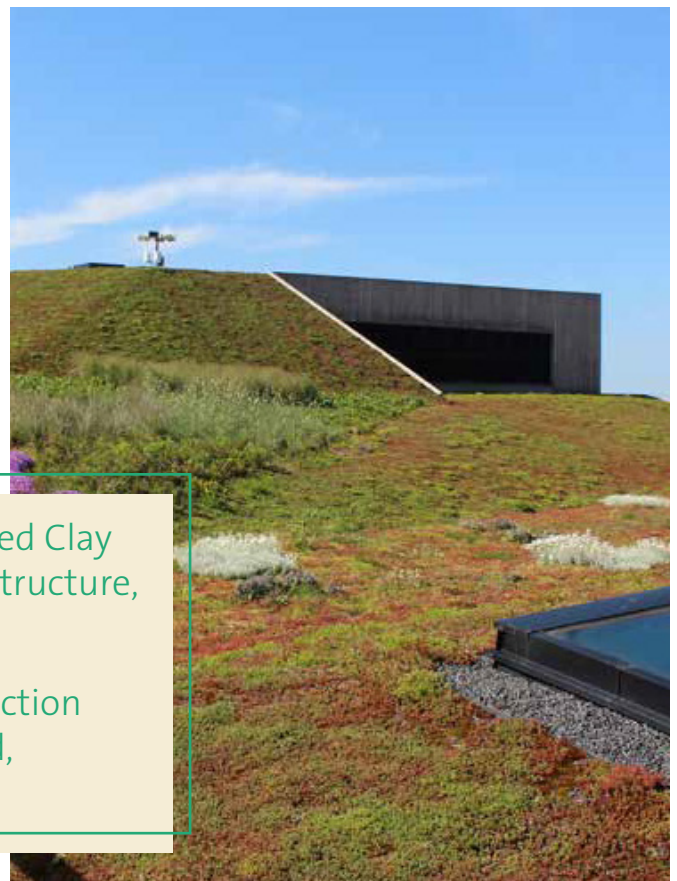


An EPD is an independently verified and registered document that communicates transparent and comparable information about the lifecycle environmental impact of products in a credible way. EPDs are produced accordingly with the ISO International Standards, ISO 14025, based on the Product Category Rules. For Lightweight Expanded Clay the related CEN Standard is: EN 15804:2012 + A2:2019.

## Did you know ?

We are the number #1 supplier of Expanded Clay Lightweight Aggregate in Europe in Infrastructure, Housing and Water Management.

We are present in 12 countries with production sites in Denmark, Finland, Norway, Poland, Portugal and Estonia.

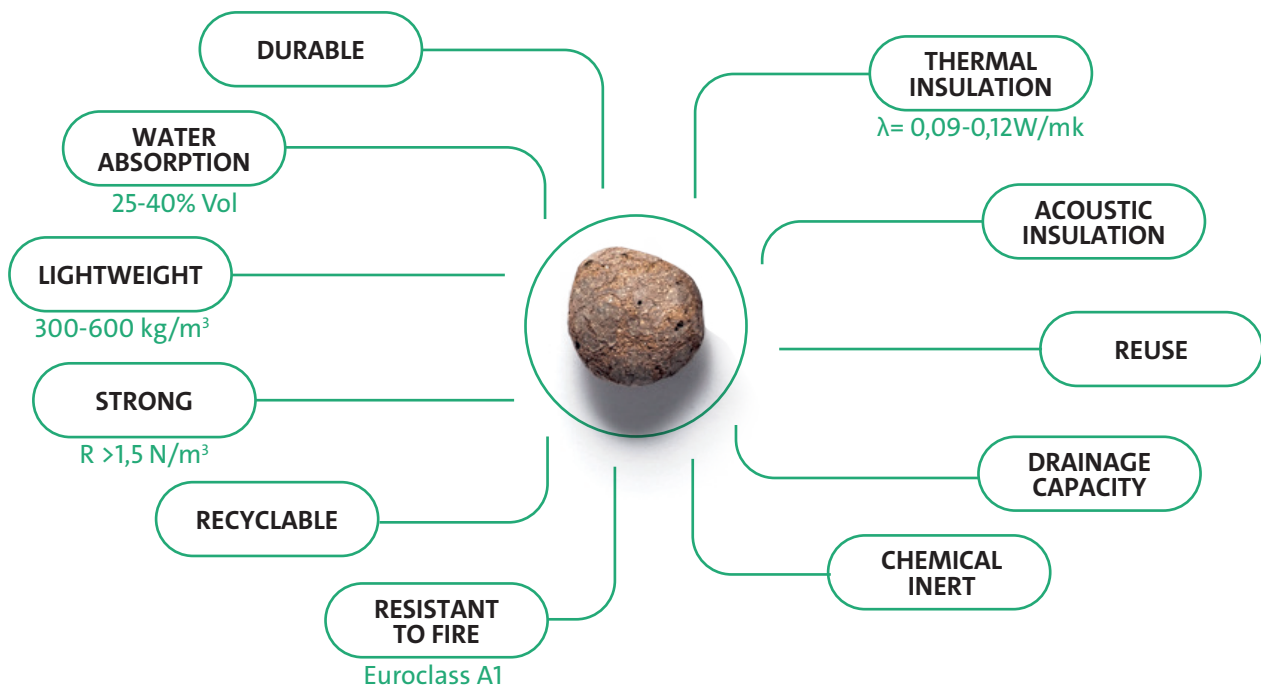




# Simple ideas often last longer

Leca® LWA is made from abundant fresh clay and produced through pre-treatment and high temperature expansion. Leca® LWA is a natural product, with a number of environmental benefits in the complete project life cycle from transport, application, “living” and reuse. While Leca® LWA is a simple product, our solutions are innovative and sustainable.

Leca® LWA is a unique and natural product, and adopts the circular economy. Leca® LWA lasts “forever” and can be “reborn”; from the more typical applications Leca® LWA can easily be reused.



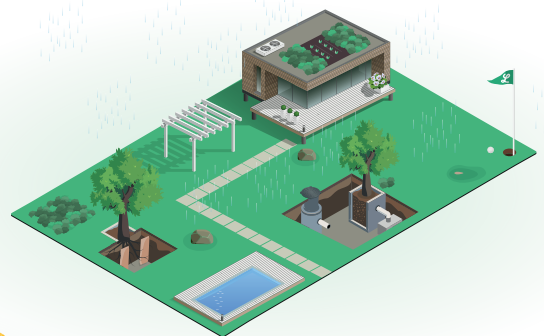
## Housing



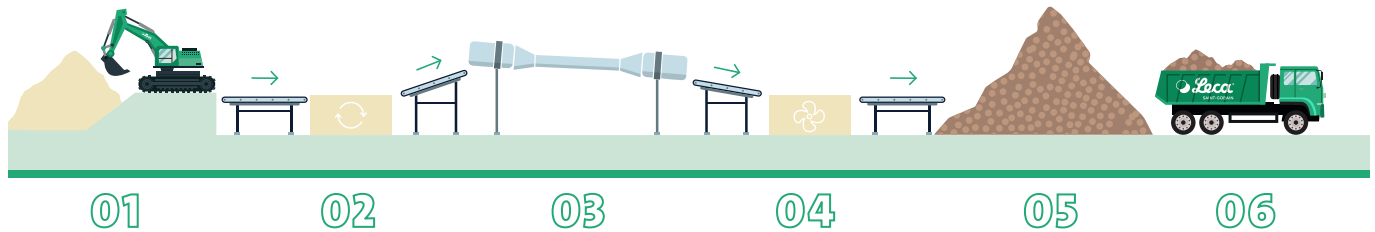
## Infrastructure



## Water Management



# Leca® LWA production process



## 01 Clay extraction

The clay is extracted from clay pits normally located close to the plants, thus keeping haulage costs and carbon emissions to a minimum. The clay pits are restored and rehabilitated to both preserve biodiversity and create new natural habitats.

## 02 Pretreatment

The clay goes to the production line where the mechanical treatment took place and some additives are added to the clay.

## 03 Rotary kiln

The kilns are heated to temperatures up to 1.150°C and this process transforms the clay into various sized lightweight aggregates with a hard ceramic shell and a porous core. The raw material is expanded approximate 5 times during the kiln process.

## 04 Cooling

A correct cooling process is essential to ensure a high-quality product. This process is made with air.

## 05 Final product

A sustainable light weight aggregate made for housing, infrastructure or water management applications.

## 06 Delivering Complete LWA

Leca® LWA can be supplied in bulk, big-bags or a variety of small bags. For special building sites where access is an issue or the material need to be lifted to higher levels, we can supply the Leca® LWA with blowing vehicles for fast and easy application.

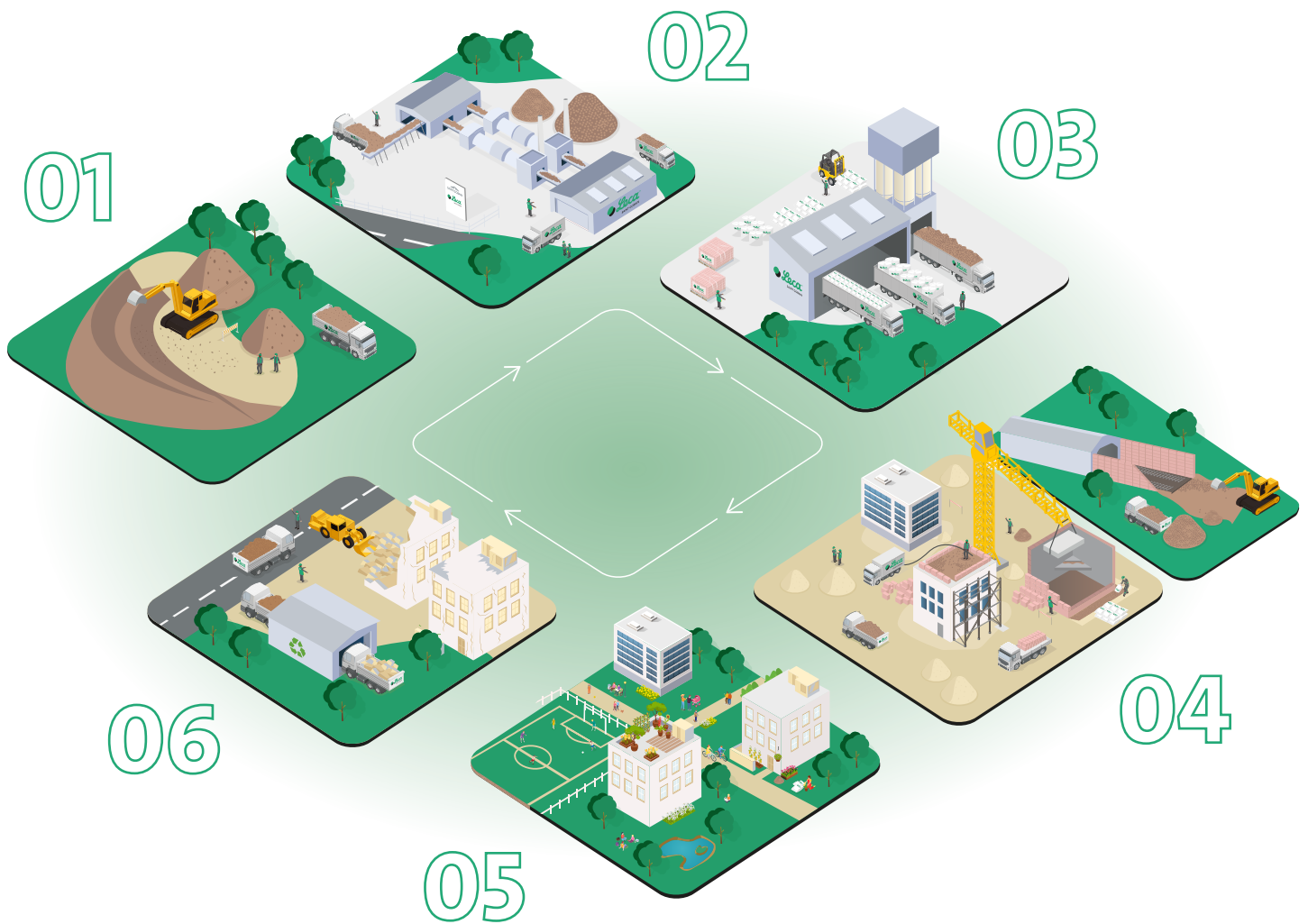
## Did you know ?

Compared to traditional filling material Leca® LWA is fast and easy with the following characteristics:

- Lightweight
- Resistant
- Durable
- Improve drainage
- Thermal insulation
- Flexible design
- Reusable



# Leca® LWA integral process



**01** | **RAW MATERIAL**  
Focus on decreasing the consumption of raw materials.

**04** | **TRANSPORT & CONSTRUCTION**  
Fast and easy installation with focus on health and safety.

**02** | **PROCESSING**  
A sustainable production transforming 1m³ of clay in to 5m³ of sustainable construction material.

**05** | **LIVING**  
Comfortable and healthy living spaces, saving energy with lowest possible maintenance.

**03** | **HANDLING**  
An eco-friendly way to arrive to you, maximum utilization of the transport volume in bags or bulk.

**06** | **REUSE RECYCLE**  
Zero waste, is that really possible? Leca® LWA can be easily reused or recycled.

# Decreasing the consumption of raw materials

Our main raw material is abundant clay, usually fresh clay from our own clay pits. Extracting clay does not require much energy. In addition, the clay pits are continuously restored in order to preserve the natural site and its biodiversity.

However, we can use sub products today and waste materials from other industries as raw materials. We introduce waste materials or sub products from GLAVA, ECOPHONE, CUTILENE and other industries, like paper industries in our process. This enables us to create a second life to these materials, minimizing the need for landfilling and furthermore, decreasing the consumption of virgin raw materials.



Our sustainable targets for 2030 are:

- Reduce the use of raw materials by 10%
- All packaging material will be recycled or reusable

The raw materials do not end here. Packaging materials are part of the raw materials needed for the production. Through our ongoing sustainability focus, we have been changing the packing material with a recycled content and/or from a bio-based material.

## Did you know ?

The pallets used to transport our bagged material come from sustainably managed forests in Europe.



# A sustainable production

The fresh clay enters into the production line, where a mechanical pre-treatment takes place. Following this stage, some additives are added and the clay goes into the rotary kiln. It is in the rotary kiln where the expansion of the clay occurs at a temperature of around 1.150°C. This process allows us to produce the Leca® LWA, from 1 m<sup>3</sup> of clay to 5m<sup>3</sup> of Leca® LWA.

After the kiln process, the material is cooled with air and is sieved for the final applications. At this stage the aggregate is ready to be delivered to you.

All LECA production sites are certified with ISO 9001 and ISO 14001 and our Leca® LWA products are certified according with the final use ISO 13055-1, ISO 13055-2, ISO 14063 and ISO 15732.



Our sustainable targets for 2030 are:

- Reduce the CO<sub>2</sub> direct emissions (Scope 1 – GHG Protocol) by 50%
- Zero CO<sub>2</sub> indirect emissions (Scope 2)
- Zero environmental incidents



## Did you know ?

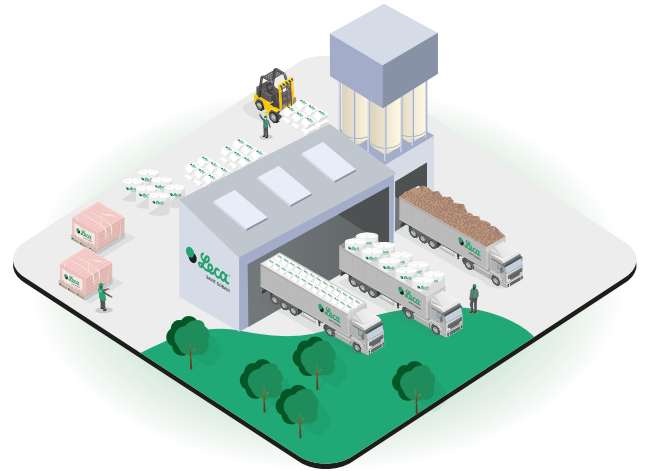
To understand the expansion process, you can compare this to the way popcorn is made.



# An eco-friendly way to arrive to you

Leca® LWA can arrive to you in different forms. It can be delivered in bulk, big-bags or small bags. We can even provide special blowing vehicles for fast & easy application into locations where other aggregate cannot reach.

Leca® LWA, being a lightweight aggregate, allows for an increase in the volume / load capacity of trucks, meaning fewer trucks on the road, in city centers and in the most sensitive rural areas. In other words, less CO<sub>2</sub> emissions, reduced transport costs, less wear and tear on road infrastructures and time savings in carrying out works.



Our goal is to reduce the supply chain emissions with >10% before 2030.

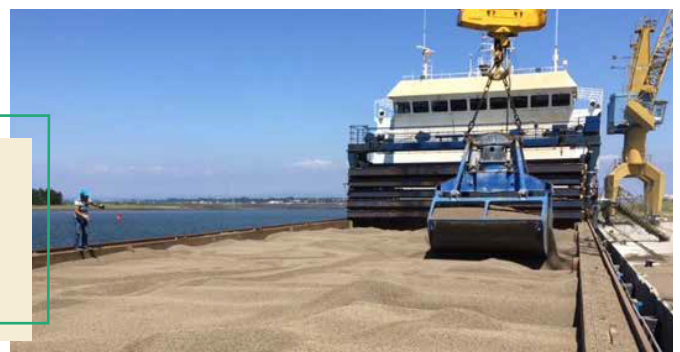


One of our projects is to improve our logistical processes, for both raw materials and for finished goods. Our supply chain emissions in 2017, represented 8% of our total CO<sub>2</sub> emissions.\*For example, transportation by vessel leaves less environmental impact than road freight, hence we are looking into how to change our European supply routes. Type of vessel and truck will also be within our scope and we want to work with our transport partners to give the market the best and most sustainable service as possible.

\* According with the GHG Protocol the CO<sub>2</sub> emission can be account in three categories – Scope 1, Scope 2 and Scope 3. The direct emissions from the process are account in Scope 1. The Scope 2 is related with the indirect emissions like the purchased electricity and the Scope 3 is related with the supply chain emissions like the purchased goods and transportation.

## Did you know ?

1 Leca® LWA truck can transport the same volume as 4 trucks transporting sand / gravel.

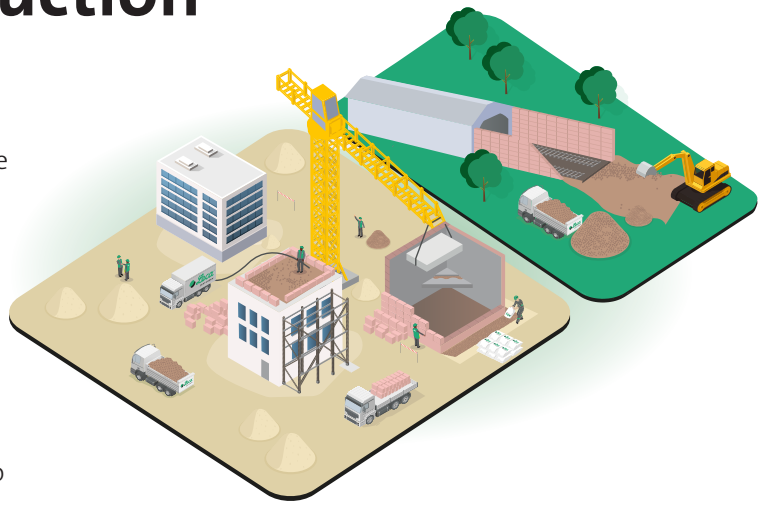


# Easy installation and a faster construction

Often you cannot see us, but every time you look for a construction site, whether a housing, infrastructure or even a water management project, there is a huge probability that Leca® LWA has been applied.

Besides our technical proprieties, which allow us to describe Leca® LWA as an “All-in-one” product, we cannot forget the fast & easy way of installing the product on a construction sites. As an example, for construction sites with difficult access, the material can be pneumatically blown into the exact location.

Also, the Leca® Blocks is another great example, creating lightweight blocks to the building process compared to conventional heavier blocks. The health and well-being of the construction workers will be improved through building with our lightweight blocks.



Leca® LWA blocks generally offer a number of key benefits over traditional brick, block and cement solutions.



## Did you know ?

That we have developed a tailor made Leca® LWA for lightweight high strength concrete - LWAC.



Courtesy of Transport Scotland



# Comfort, health and energy saving

Living in a house built with Blocks and Leca® LWA creates comfort and a healthy environment. Our Leca® Blocks comply with the European construction guidelines and helps to improve the energy consumption of the building. Moreover, Leca® blocks significantly reduce the maintenance of the building, saving money, time and reduces the use of environmentally dangerous products.

Houses built with Leca® Blocks will bring comfort, with significant energy savings for heating / cooling due to the heat transfer of the blocks. Moreover, Leca® Blocks also have a noise attenuation effect creating a quieter interior - providing protection from an externally noisy environment.



## Did you know ?

We spend almost 90% of our time in buildings.

If you use Leca® LWA, as an example, in foundations or ground floors, you will have an aggregate that brings drainage properties, improve thermal insulation, free of toxic substances and that can be reused in the future. Houses built with Leca® products are solid homes.

The blocks contain only natural materials such as clay, cement and sand. As these materials are inorganic, they do not emit substances that are harmful to health or the environment.

# Zero waste is that really possible?

At the end of life of any construction the building materials turn into waste. Historically, the destination of waste materials was not a concern and landfilling waste material was the easiest and cheapest option.

Now the concerns have changed and an environmental and correct material end-of-life process is needed.

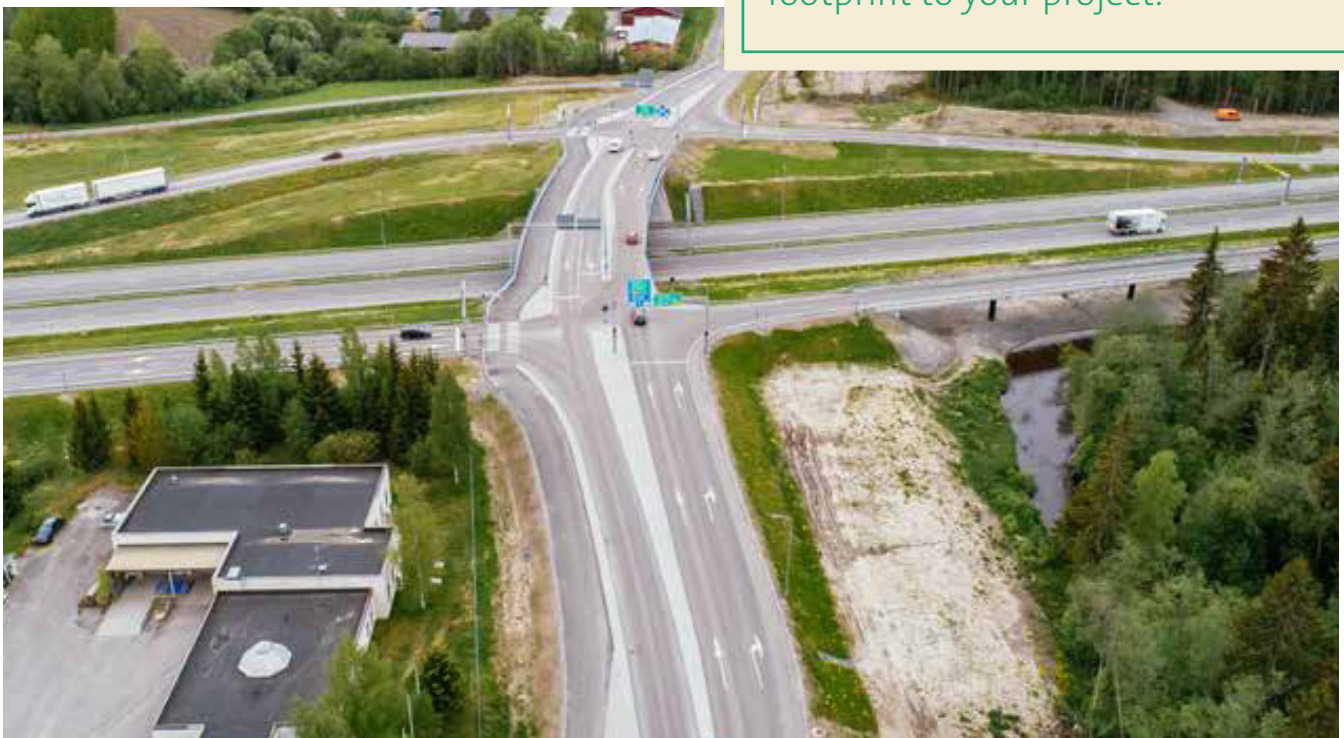
During production of Leca® LWA, the waste that we produce is re-introduced into the process, basically not generating any waste at all. And, as referred to on page 8 we use sub-products and waste materials from other industries as our raw materials.

But what about the Leca® LWA used in your projects? When we enter in demolition phase of a construction we can generate a second life to the Leca® LWA. The aggregate can be reused directly in another project if not physically damaged or polluted. It can also be incorporated in new Leca® Blocks or go back into the production of new Leca® LWA. Another possibility is to “return to sender”, meaning returning the aggregate to the clay pit where it originally came from. Because, as we like to state: “we borrow from nature”.



## Did you know ?

Reused Leca® LWA will bring same quality but lower CO<sub>2</sub> footprint to your project.



Project in Lahti-Hollola, Finland, here reused material was applied.

# The main sustainable properties of Leca® LWA?

## Durability

Expanded clay is durable, has a long lifetime and requires no maintenance.

## Adds Strength

Expanded clay can reduce the weight of concrete by almost 50% without compromising strength.

## Lightweight

It is 4-5 times lighter than loose gravel or loose fill crushed stone.

## Strong

It can be used as a loose fill and insulation in road and rail embankments and can sustain dynamic loads from heavy high-speed trains.

## Recyclable

Expanded clay is 100% recyclable or reusable. There are no problems with the disposing of demolition waste and no requirements for new materials, new resources or new energy.

## Resistant to fire

It is classified as a fully non-combustible material. It has no reaction to fire, does not emit gases or smoke and retains its mechanical resistance and all other thermal and physical characteristics. It offers excellent protection against fire hazards.

## A Thermal Insulating material

Insulating performance of loose fill expanded clay is in the same range as the best values of wood. Concrete made with expanded clay can be up to 12 times more insulating than normal concrete: winter and summer comfort is guaranteed.

## Reduces the Noise

It works well for both acoustic insulation and sound absorption. It is suitable in the home as a wall between dwellings and effectively acts as a barrier between houses and noisy infrastructures.

## Has a Never-Ending Life

Expanded clay is chemically inert, contains no harmful substances or gases and is completely neutral. Its resistance to chemical attack is comparable to that of a glazed tile, glass or other ceramic materials.

## Protects the Environment

There is no dangerous leaching from expanded clay, even when in contact with soil, water or rain. It does not emit VOCs or any other dangerous substances. It is good for the environment and good for health.

## Manages Heavy Rainfall

Quick water drainage and run-off is guaranteed thanks to the 40% of hollow space between the grains. This enables the “run off” of water in urban areas to be controlled, protecting the natural environment and preventing flooding.

## Used from the North Pole to the Equator

Unlike other materials it is not affected by freezing temperatures. It will not warp, break or burst. It is widely used in Northern European countries exposed to extreme weather conditions.







**together we build  
for the future**

