



VANDE MOORTELE
BRICKS · SLIPS · PAVERS

SUSTAINABILITY & CIRCULARITY

CERAMIC ROADMAP TO 2050

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THE EUROPEAN CERAMIC INDUSTRY

The European ceramic industry is a global leader in production and innovation. An energy-intensive industry, they face substantial climate-related challenges, while simultaneously providing other industries with products that contribute to energy and CO₂ reduction. The industry primarily consists of local, integrated supply chains, and supports strategic industries such as construction and infrastructure. With over 200,000 jobs and an annual production value of €28 billion, its economic role within Europe is significant.

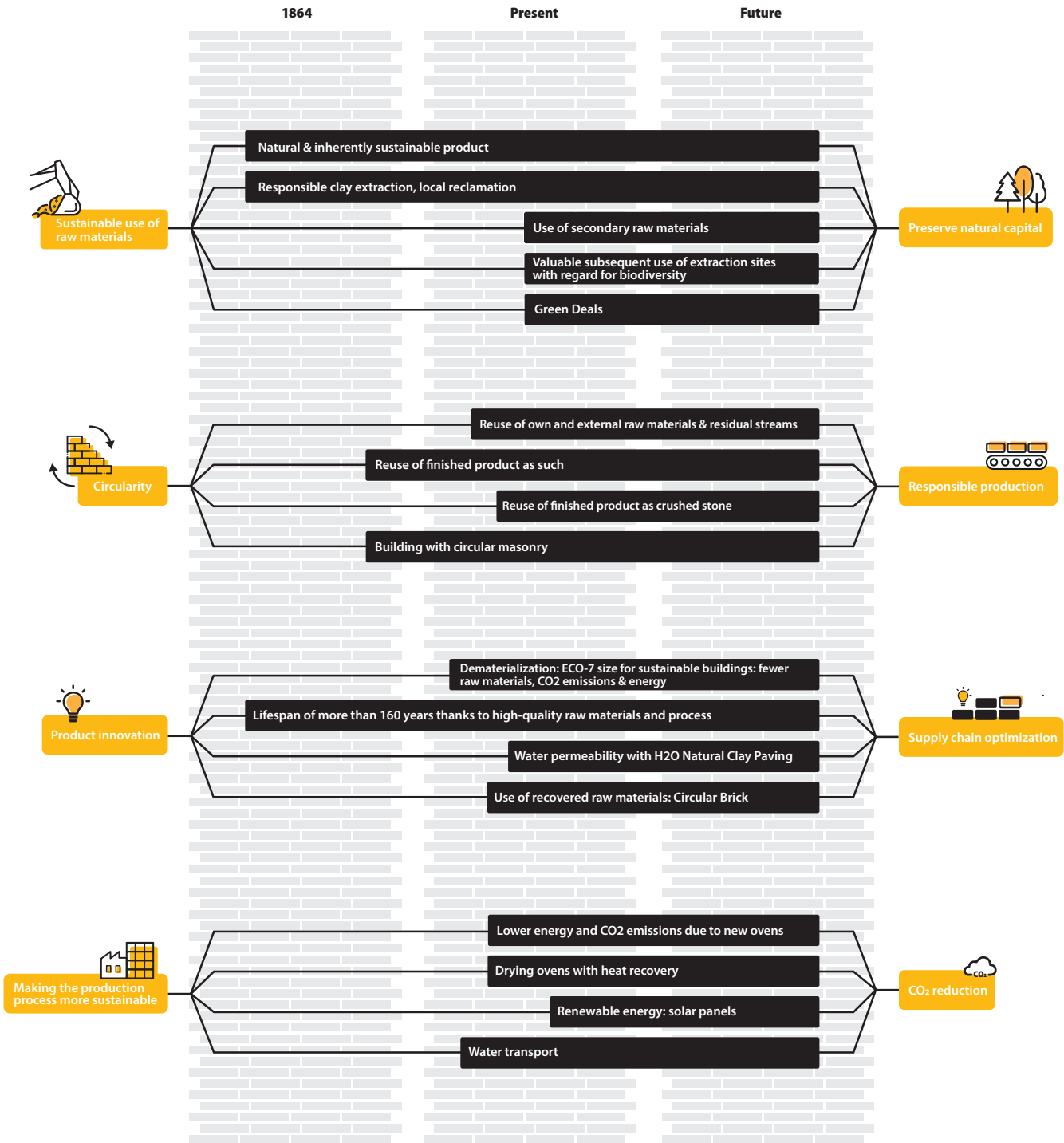
Against this background, the European Climate Act aims to make Europe climate neutral by 2050, with an interim milestone of a reduction of greenhouse gas emissions by 2030 of at least 55% in comparison with 1990. Achieving these objectives requires participation of the ceramic industry in its entirety: from technological renewal to production process sustainability. The European ceramic industry has reduced overall emissions since 1990 by around 33%, and by over 45% since the peak of emissions and production in the 2000s.

CERAMIC ROADMAP

At Steenbakkerij Vande Moortel, we take our responsibility seriously, and we are actively committed to the transition to a low-carbon future. We base our approach on four strategic pillars, as also formulated in the Ceramic roadmap to 2050:



Below, we will set out the concrete steps we've already taken and continue to take under each of these pillars, and how this allows us to contribute to the climate goals of both the industry and Europe.



PRESERVING NATURAL CAPITAL THROUGH SUSTAINABLE USE OF RAW MATERIALS

NATURAL AND INHERENTLY SUSTAINABLE PRODUCT

Ceramic facing bricks and fired clay pavers are inherently durable, as they are made solely from **natural raw materials** such as clay, sand, water, oxygen, and fire. Thanks to these raw materials and the production process, they have an exceptionally long service life, which can last over **160 years**. Brick is, after all, a material designed to last for generations, as demonstrated by the average service life of a brick building, which is estimated to exceed 100 years.

“100% natural, down to the very core”

Thanks to the natural ingredients of clay, sand, loam and minerals, which are combined according to unique recipes, we can obtain a fully natural end product in a rich palette of colours and nuances. The colour and shades develop naturally during the manufacturing process and are inherent to the stone, all the way **down to its mass**. This allows authentic facing bricks and clay pavers to **retain their colour** without fading, wear or discolouration due to impact or external factors. It guarantees a lasting aesthetic result, even after years of intensive use or exposure to the weather and the wind.



Nuanced red tones and coal fire marks through an artisanal, hand-made process



Raw material clay



Raw material clay

Moreover, the raw material of clay is a renewable raw material thanks to a constant process of natural depositing. For centuries, the clay has served as a raw material for brick production, a tradition that Vande Moortel continues to this day - in-house.

Bricks and clay pavers are also inert materials - they do not react with other substances and do not emit toxic or allergenic substances. The result is that they do not pose any risk of soil pollution. This property makes clay pavers noble hardening materials that develop a natural patina over time, and require minimal maintenance.

Additionally, façades with brickwork or squares paved with clay pavers have an **authentic** and **timeless appearance**, and this type of façade cladding and paving has been durable for decades. The most sustainable building is one that is never demolished. A brick building has a certain panache, exuding character and authenticity. Indeed, good architecture rarely gets demolished. There are numerous examples of squares and parks paved with clay bricks that have served for several generations. The product as such is not trend-driven, but can nevertheless

adapt flexibly to changing trends in colour, texture, or format. Brick is robust, low-maintenance, non-combustible, and able to withstand the extreme conditions of our climate. Architects, designers and clients deliberately choose facing brick for these durable and aesthetic qualities, combined with its great design flexibility and wide range of applications. Not to mention that ceramic building materials require no maintenance, significantly reducing their environmental impact. This makes facing bricks and clay pavers some of the most durable building materials available.

RESPONSIBLE CLAY SOURCING THROUGH LOCAL QUARRYING

The brickworks has been located on the banks of the Scheldt River since its foundation. The raw materials for facing bricks and clay pavers, namely sand and clay, are primarily **locally sourced** around the brickworks itself. Thanks to its location, **clay transport is limited** and the **environmental footprint is minimised**. We always aim to minimise impact on the surroundings.



The brickworks located on the banks of the Scheldt River



Infrastructure works at the lock in Kerkhove

USE OF SECONDARY RAW MATERIALS

For the production of all facing bricks and clay pavers, we also make maximum use of **secondary raw materials**, such as loam and clay, which **are released during infrastructure works and construction projects**. These raw materials regularly become available during excavation works for nearby construction sites. During the infrastructure works at the Sluis in Kerkhove, for example, Vande Moortel recovered some 72,500 m³ of clay. This raw material was released during these works and found a new life in Oudenaarde at the brickworks. Moreover, the entire transport was carried out through water transport on the Schelde, thus avoiding the need for 5,200 trucks. This way, Vande Moortel achieved two of its objectives: maximising the use and recovery of secondary raw materials, and commitment to sustainable transport via the waterways.

VALUABLE AFTER-USE OF EXTRACTION SITES WITH DUE REGARD FOR BIODIVERSITY

After extraction and processing of the raw materials, the site undergoes a redevelopment that also enhances biodiversity. As an example, the former extraction pit of the Brickworks on the right bank of the Schelde is being transformed into an area of high biodiversity values. It is Vande Moortel's ambition, in

consultation with the various stakeholders, to develop an area as a marshy wetland with high biodiversity values, including birds, amphibians, insects, reed beds, and other valuable vegetation. "In the past, we were able to extract clay, a renewable raw material, from this site. Today, we begin with the after-use and aim for an attractive natural area, a home for a variety of fauna and flora, and a place where people enjoy spending time," says Peter Vande Moortel. This way, through the sustainable extraction of our locally sourced raw materials, we contribute to biodiversity.



Commercial Director Filip Melis signs the Green Deal

GREEN DEALS

Many sustainable and circular innovations originate from the Green Deals, with our company continuing to actively engage in an innovative learning network to share practical experiences with other construction companies, building materials manufacturers, local and regional authorities, private developers, researchers, and other organisations. Vande Moortel also supports the **Green Deal Natural Gardens**, together with all trade associations from the garden sector, an initiative of the Tuin+ Knowledge Centre and the Erasmushogeschool.

One such initiative is the redevelopment of our own site, where we transformed the former concreted yard into a modern, functional space with a focus on nature. In total, over 200 trees were

planted and **permeable surfacing** was installed using **brick rubble** and **pavers** in combination with **H₂O Natural Clay Paving Sand**. With the transition of our site from concrete surfacing to a modern, functional space fully attentive to nature and climate, we are part of the Flemish Government's "Green Deal for Companies and Biodiversity".

As a participant in the Green Deal Garden Streets, we are initiating a shift in Flanders to structurally create more garden streets. By bringing together councils, residents, businesses and other stakeholders, we aim to raise awareness, build knowledge and provide practical support to transform ordinary streets into thriving garden streets. Our aim is for an ambitious 1,000 completed garden streets by 2030.

The objectives of the initiators and the 100 companies currently participating are:



Parking space at Vande Moortel



ENHANCING BIODIVERSITY IN FLANDERS



USING GARDENS TO HELP ADDRESS DROUGHT-RELATED ISSUES



INTRODUCING CIRCULAR PRINCIPLES IN GARDEN DESIGN



CREATING A SUSTAINABLE GREEN ZONE FROM ALL THE GARDENS COMBINED



Former extraction pit is being transformed into an area with high biodiversity values

RESPONSIBLE PRODUCTION THANKS TO A CIRCULAR APPROACH

Ceramic facing bricks and clay pavers are not only a naturally durable product, but also lend themselves perfectly to circularity. In addition to the recovery and circular use of secondary raw materials for production, facing bricks and clay pavers themselves can also be given a second life. This type of recovery or reuse can take place in two ways: recovery of the whole finished product, the facing brick or clay paver itself as a reclaimed brick/reclaimed clay paver, or recovery through “urban mining”.

REUSE OF RAW MATERIALS AND WASTE STREAMS, BOTH IN-HOUSE AND FROM EXTERNAL SOURCES

For the production of all facing bricks and clay pavers, the brick-works uses almost 50% **recovered raw materials** released from local infrastructure projects and construction sites. This circular use of raw materials has been applied for many years and provides a diverse mix of ingredients for a unique finish in facing bricks and clay pavers.

In 2024, Vande Moortel launched its **Circular Brick** on the market. This new category is a prime example of the circular economy and responsible material use within the industry. This circular facing brick promotes circularity through the recycling and reuse of secondary raw materials, enabling the production of an entirely new facing brick. The concept partially grew out of participation in the Circular Construction Green Deal. For this facing brick, a specific batch is produced exclusively from available unextracted raw materials. This production therefore consists of 100% of raw materials originating from our own residual flows, infrastructure works or other production units. The colour, composition and quantity of bricks are thus fully determined by the secondary raw materials available at that particular time.

RECOVERY OF FINISHED PRODUCT OR “PRIMARY CIRCULARITY”

When an old building is dismantled, many materials, particularly old façade bricks, can still enjoy a long remaining lifespan in new use, so it would be a shame not to make optimal use of them. The recovery and reuse of old bricks, known as **reclaimed bricks**, is gaining ground with an eye to circularity. There are numerous examples where reclaimed bricks can be reused in various applications, either on the same site or elsewhere, for

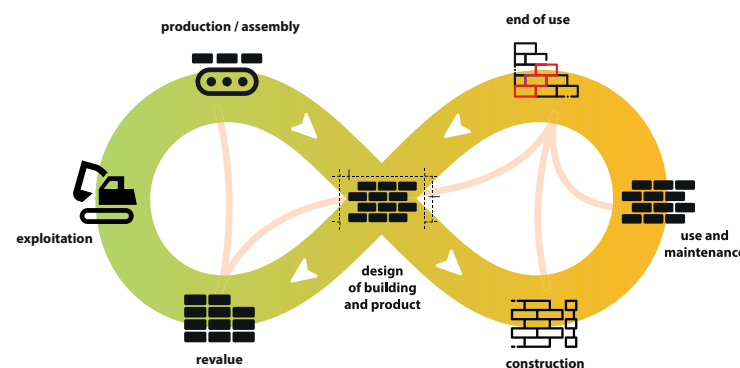


The clay pavers on the Market Square in Sint-Niklaas are being removed and stored on pallets.

Crushed bricks are used as a water-permeable infiltration layer (Kerktuin Wetteren)

restoration or new-build projects, for both traditional and contemporary schemes.

Clay pavers also possess a highly circular character and can be reused multiple times, either on-site in a renovation or in another project. At the **Grote Markt in Sint-Niklaas**, for example, the existing Vande Moortel clay pavers were carefully removed and reused in the market's new layout. Of the more than 1.2 million clay pavers from the old Grote Markt, over 60% has been reincorporated into the new project, particularly along the edges of the square and the connections with the surrounding streets. Any bricks not reused in the renovation will be brought back onto the market by Vande Moortel as reclaimed clay pavers, a principle is also referred to here as **“primary circularity”**



CONSTRUCTION USING CIRCULAR MASONRY

Circular approaches can also be applied in the use of facing bricks in masonry. To improve the circularity of masonry, alternative mortars are being developed using natural and environmentally friendly raw materials. In addition to the bricklaying mortar, a suitable joint mortar is also being investigated, with the aim of including both in a library of circular building materials. All mortars are evaluated on their composition, technical performance and workability. The ultimate aim is for masonry that can be easily dismantled at a later stage, so that the materials remain fully reusable for new façade constructions.

REUSE OF WATER

For the production of our facing bricks and clay pavers, only surface water is used. We do not make use of mains water. We also implement zero discharge of water, meaning that all water streams in production are fully reused.

RECOVERY VIA URBAN MINING OR “SECONDARY CIRCULARITY”

In addition to the reuse of products in their original function, we also give used facing bricks and clay pavers a new purpose, including through “urban mining”. In this “secondary circularity”, bricks are broken down into coarse aggregate, so the material can then be repurposed in the construction of paving and as a permeable infiltration layer. Even brick rubble from demolition sites can be recycled and reused as a sub-base layer.

The churchyard at St Gertrude's Church in Wetteren is a prime example of such reuse of existing materials, where crushed façade bricks and clay pavers are used as a water-permeable infiltration layer. Crushed brick was also reused as surfacing in the car park of the Vande Moortel site. These ground clay pavers were laid atop a permeable substructure. A circular application of clay pavers that can no longer be reused as such, meaning that, in principle, a clay paver should never have to end up in construction waste. Even for tennis courts, crushed brick is used as gravel, and circular recovery can also be applied here.

This way, the waste stream is minimised and materials are used circularly in two ways: by reusing products in their original condition, or by giving them a second life, with brick rubble used as an infiltration layer or construction debris as a sub-base layer.



Crushed bricks

PRODUCT INNOVATION LEADS TO CHAIN OPTIMISATION

DEMATERIALIZATION THANKS TO AN ECO-SLIM FORMAT WITH A BROAD ENVIRONMENTAL IMPACT

In 2004, Vande Moortel launched one of its most significant product innovations, substantially reducing the CO₂ emissions from the production of facing bricks and clay pavers. The brickworks was the very first manufacturer to switch from a façade brick with the traditional 10 cm thickness to 7 cm, which we now call the ECO-7-size format. This led us to become the first to produce the traditional Waal format at 7 cm instead of 10 cm, followed by other formats such as the linea façade brick and the Rijn format clay pavers Ancienne Belgique.



Hilversums format (ECO-7-size) facing brick

Thanks to this innovation, mining and production days are saved, CO₂ emissions during production are reduced by an impressive 30%, and transport is significantly reduced. With this reduction, **the brickworks has already saved approx. 65,000 tonnes of CO₂ over the past 20 years.** Only in recent years has this format been adopted by competitors. If all manufacturers follow this example and switch entirely to the ECO-7-size format, the industry would collectively save as much as **approx. 100,000 tonnes of CO₂ emissions per year in Belgium.** If the neighbouring countries were to follow suit, the result would be even more effective. This ecological format of facing brick can also be used with all traditional methods, ensuring its circular character is maintained. Moreover, this format experiences no loss of quality compared to the traditional formats, thereby ensuring a long service life. By consistently applying this principle as a company over many years, this innovation is gradually being adopted in our neighbouring countries, who are now also seeing the same results.

The ecological ECO-7-size format is also used for clay bricks, offering the same ecological and sustainable benefits. This small-scale hardening material can also be used permeably, and can be reused multiple times in the ecologically optimised format without any loss of quality.



We are constantly expanding the entire product line with the ecological ECO-7-size format; last year we launched the Ancienne Belgique 7 clay paver, meaning that today the entire range of clay pavers is offered in this format. The selection in the ECO-7-size format is now also available on nearly the full range of facing bricks, thanks to the launch of the linea7 Hand-Made collection. The linea Hand-Made collection in the traditional format is thus being converted to the ecological format. The number of products in this format grows larger every year. The brickworks' objective is to now offer all products in the Belgian range in ECO-7, and to gradually realise this transition in export markets as well.



Ancienne Belgique clay paver



ECO-7-size offers more space for insulation

According to the Royal Dutch Building Ceramics Association (Dutch: Koninklijke Nederlandse Bouwkeramiek, KNB), these ecological slim bricks, with a width of 65 to 75 mm instead of the usual 100 mm, offer significant advantages in terms of sustainability, aesthetics and construction. They state that slim bricks reduce the environmental cost indicator (Dutch: milieukostenindicator, MKI) by up to 35% compared to traditional bricks, thanks to the reduced use of raw materials and energy during production and transport.

Furthermore, the slimmer brick provides additional space for insulation, leading to better thermal performance for buildings. The lower weight also reduces the load on façade supports and foundations, decreasing physical strain for bricklayers. The Royal Dutch Building Ceramics Association emphasises that slim brick façades offer a sustainable and aesthetically attractive alternative to traditional façade constructions, with practical benefits for designers, structural engineers and contractors.



Ancienne Belgique7 clay paver

VOORDELEN VAN ECO-7-SIZE



FEWER RAW MATERIALS IN PRODUCTION



30% REDUCTION IN CO₂ EMISSIONS



SAME QUALITY AND SERVICE LIFE AS THE CLASSICAL FORMAT



LOWER ENERGY CONSUMPTION IN PRODUCTION



MORE EFFICIENT TRANSPORT



OPTIMISED PRICE-QUALITY RATIO



CAN BE PROCESSED USING TRADITIONAL TECHNIQUES



Hoxton Press Towers Hackney London

SERVICE LIFE OF MORE THAN 160 YEARS THANKS TO HIGH-QUALITY RAW MATERIALS AND CONTINUOUS PRODUCT OPTIMISATION

Thanks to **responsible material use** of **high-quality raw materials** and a continuous process of **product optimisation**, the facing bricks and clay pavers meet the highest quality standards and have a service life of **more than 160 years**. They are durable, and stand up against the test of time and various environmental factors. The strength and robustness of Vande Moortel bricks make them essential for solid constructions. Besides aesthetics and sustainability, there is a strong focus on quality. The bricks, produced in Oudenaarde, consistently meet the **highest quality standards**. The bricks standardly perform above the Belgian standards, which are among the strictest in the world. For instance, the clay pavers have a very **low water absorption** and the facing bricks have a **high compressive strength**. In addition to the mandatory **CE marking** and the **DoP (Declaration of Performance)**, we also award our products the **BENOR label**. This voluntary quality label is awarded to products that meet specific technical requirements and standards in Belgium, and provides independent and reliable certification for construction products with specific technical properties.



Chelsea Embankment London

Clay pavers moreover undergo a specific production process, resulting in a harder material with higher abrasion resistance and low water absorption. This forms the clay paver into a durable material capable of withstanding higher loads and horizontal use, making them suitable for car parks and paving. The very low water absorption of **class A and A+ pavers** means they absorb little moisture, reducing the risk of greening and frost damage.

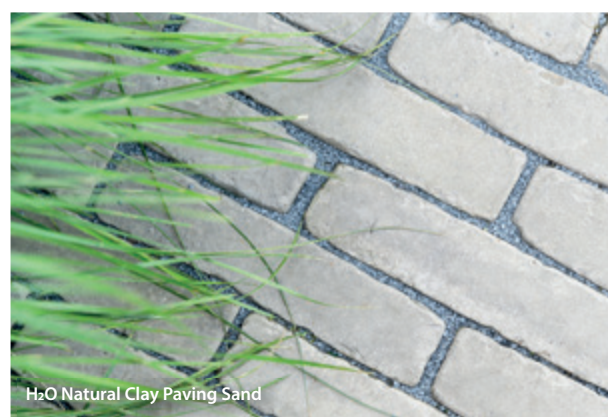


H₂O Bedding Course

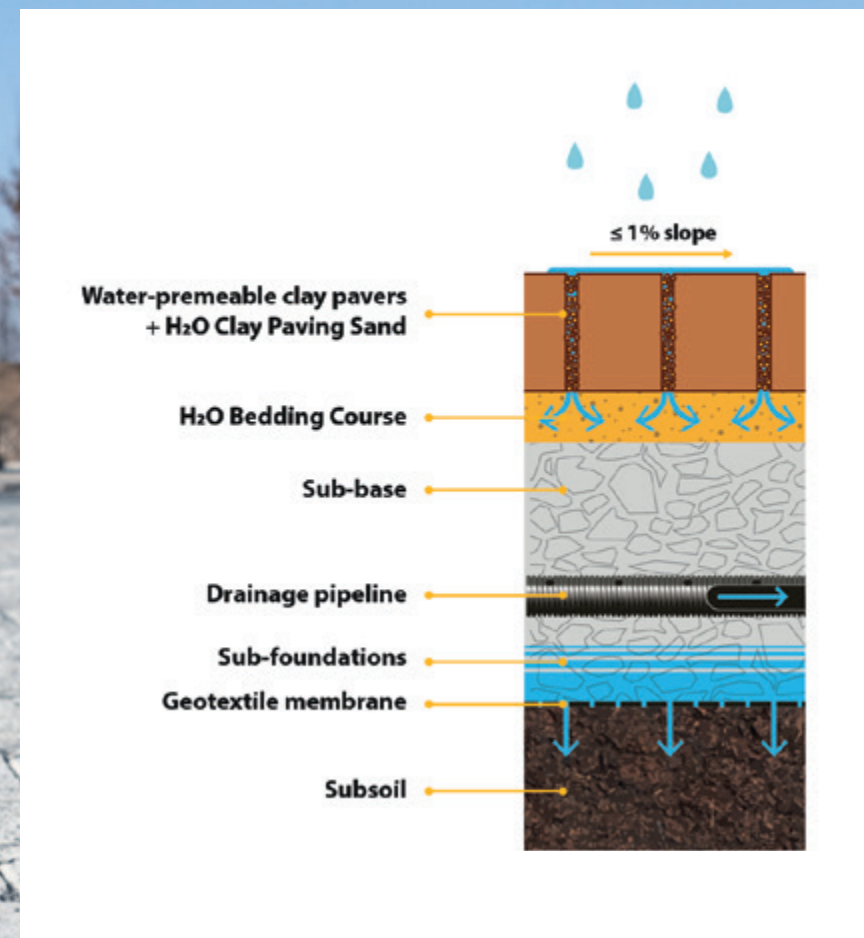
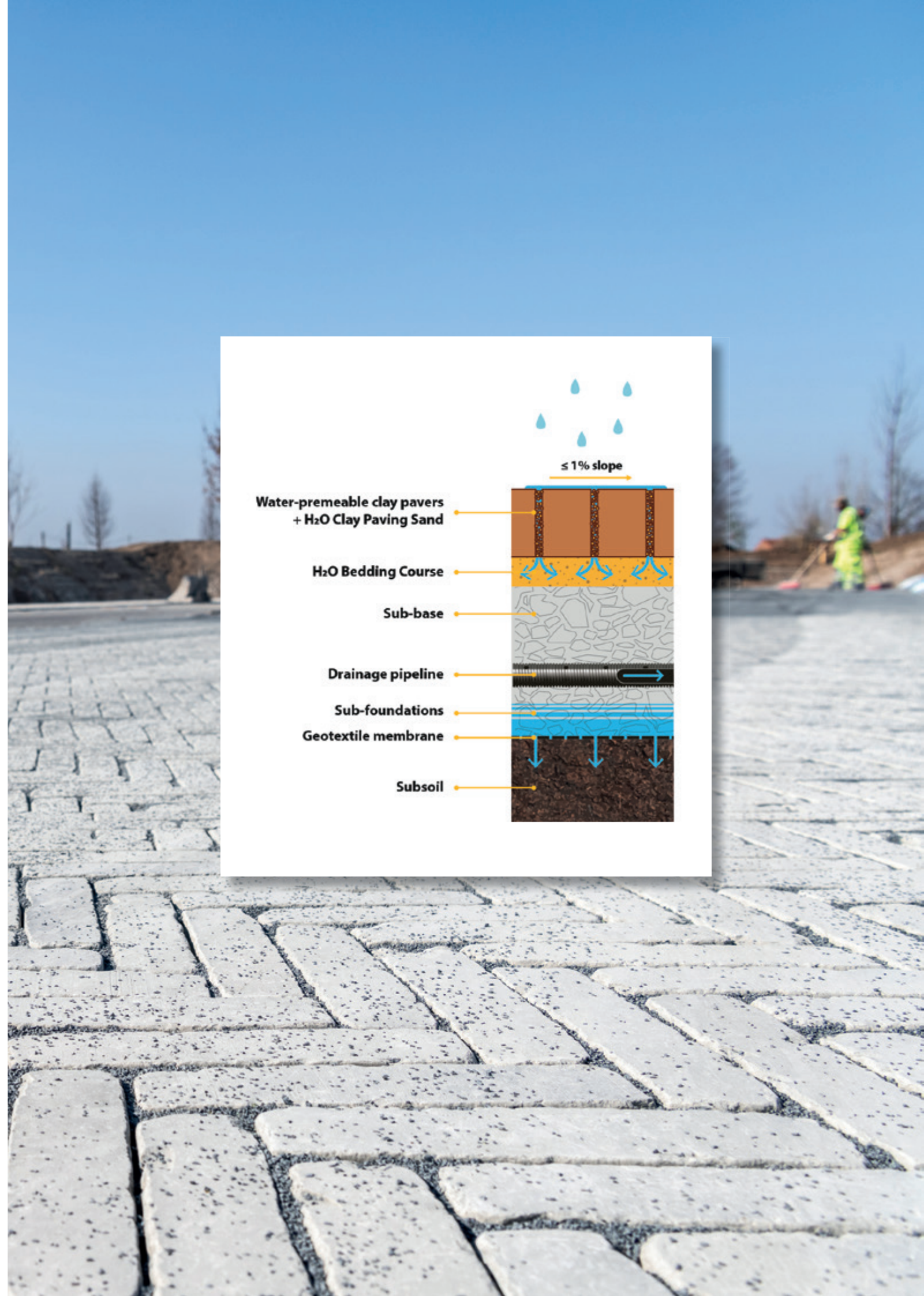
WATER PERMEABILITY WITH H₂O NATURAL CLAY PAVING

On June 23, 2026, the Flemish Department of the Environment published a list of pavements that can be considered water-permeable for residential projects in Flanders. The basic principle is that the water permeability of both the pavement and the (sub)foundation must be greater than or equal to 5.4×10^{-5} m/s. Clay pavers with wide joints, resulting from their organic and natural design, are also included in this list as permitted water-permeable paving.

With the innovative **H₂O Natural Clay Paving** principle, we introduced a water-permeable paving technique that can be combined with any clay paver from our range. All Vande Moortel clay pavers are suitable for water-permeable paving thanks to their natural character and quality features. In combination with the correct joint filling, our clay pavers offer sufficient space to allow rainwater to infiltrate into the subsoil through the traditional, natural joints between the pavers. The **H₂O Natural Clay Paving sand** was developed for this purpose. This strong, durable, and water-permeable joint filler, in accordance with current regulations and the OCV advice, allows rainwater to infiltrate on-site. The water-permeable paving and foundation drain the water slowly into the subsoil. This relieves the sewage system and maintains the groundwater level.



H₂O Natural Clay Paving Sand



MAKING THE PRODUCTION PROCESS MORE SUSTAINABLE FOR EFFECTIVE CO₂ REDUCTION

REDUCTION OF ENERGY AND CO₂ EMISSIONS DURING THE BAKING PROCESS THANKS TO NEW KILNS

The brickworks undertook an intensive investment programme to renew its kilns. Optimisation was carried out towards efficient tunnel kilns that consume less energy without compromising the quality of the facing bricks and clay pavers. Two old kilns were replaced, and two other kilns were completely refurbished with additional insulation and more efficient controls. The energy demand was thus optimised and spectacularly reduced.

DRYING KILNS WITH HEAT RECOVERY

The residual heat released during the firing process is utilised to the maximum in the drying kilns, where the pressed facing bricks and clay pavers are naturally dried using the recovered heat.

SUN, WIND AND WATER: RENEWABLE ENERGY

BAt the beginning of 2021, the installation of solar panels on top of the production halls was completed. At the beginning of 2024, we installed another 1,005 new solar panels, with the result that we now make optimal use of solar energy.

“Maximum renewable energy is the objective.”

“Today, we cover about 25% of our electricity consumption with solar panels,” says Peter Vande Moortel. “The more genuinely renewable energy we can generate, the better. We are looking at the sun, wind and water for this. There will most definitely be additional solar panels in the future, but there are also possibilities in the areas of wind and water. We are developing all options and will implement them step by step. It always requires a great deal of effort from our company, but both we and the environment benefit.”



Tunnel kiln

WATER TRANSPORT REDUCES THE ECOLOGICAL FOOTPRINT

In consultation with the local authorities and De Vlaamse Waterweg (Flemish Waterway Authority), our own unloading quay was constructed in 2010 thanks to an effective investment. Since then, all transport has been carried out over the water on the Scheldt, saving the use of 3000 trucks annually. Approximately 75,000 tonnes of goods are transported annually via inland shipping. All raw materials purchased externally by the brickworks are always transported via water transport. In addition to reducing the burden on roads and avoiding traffic jams, transport is made more sustainable and the ecological footprint is reduced.



Raw materials are unloaded at our own quay



Solar panels at the production site



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