

Austria

The Wienerberger Sustainability Program 2023: Decarbonisation, Circular Economy and Biodiversity



Fig. 1 Dr Johannes Rath,
CTO of the Business Unit Wienerberger
Building Solutions
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Wienerberger has set itself the ambitious goal of reducing its specific CO₂ emissions by 2023 by 15 % compared to 2020 and becoming climate-neutral by 2050 at the latest. The Wienerberger Sustainability Program 2023 replaces the company's Sustainability Roadmap 2020. The value creation chains have been analysed and five core topics defined: climate and energy, circular economy, biodiversity and environment, employees as well as company ethics and social impact.

As a globally operating company with almost 17 000 employees and just under 200 production sites, Wienerberger subscribes to the 17 Sustainable Development Goals (SDGs) of the UN's Agenda 2030 as a global framework for sustainable development.

Dr. Johannes Rath (JR), CTO of the Business Unit Wienerberger Building Solutions, kindly agreed to explain to us how this programme will be implemented over the entire value chain – from product development through procurement, selection of raw materials and production to use, reuse or the recycling of clay products. With its innovative building materials solutions for the newbuild and renovation sectors, Wienerberger is striving to make a key contribution to a significant improvement of energy efficiency and water management. For this, the BRICK BAUHAUS 2050 concept (page E 16) was developed, making the transition to modern, resource-efficient, healthy and competitive residential buildings in the spirit of the European Green Deal.

cfi: *What raw material, process and product optimizations are necessary to advance decarbonisation in the manufacture of heavy clay products in your product portfolio?*

JR: This work begins with the analysis of the raw materials and additives used. With specific selection of materials and the substitution of fossil additives with biogenic additives, we have already achieved a great improvement step.

The topic of biodiversity is, of course, equally essential with regard to the further development of clay pits and their renaturation or

preparation for later reuse, which is supervised by our teams of geologists and raw material specialists. Their tasks naturally include nature conservation in our mining operations.

In process optimization, we are not only ensuring the continuous improvement of energy efficiency but also increasing material efficiency. This includes avoiding scrap and the re-use of fired products and unfired materials in the process. Also, the use of secondary raw materials and high-grade recycled material plays a very important role

here, especially with regard to conserving primary resources.

We have already achieved a lot in respect of product design, too. After looking more in depth at the production of the products we learned that we could reduce their weight but still keep their technical fulfilment capabilities. Thus, we were able to reduce the material input as well as the energy consumption.

The entire product portfolio was analysed and, where appropriate, redesigned with the support of simulation calculations. So

the weights of the building elements could be reduced. In the case of facade bricks. for example, we are heading towards so-called "Eco-Bricks", with a facade thickness reduced by a third.

Avoiding joints with mortar thanks to the development of click-in bonding ("ClickBrick") is important to make the recirculation of brick products from the deconstruction of buildings more cost- and material-efficient.

cfi: *What strategy are you pursuing with regard to optimizing thermal processes?*

JR: With ongoing optimization programmes like the Plant Improvement Program (PIP) and our Production Excellence Program (PEP) as well as the management approach Design for Lean Six Sigma (DFSS), we are continuously improving our production processes, and increasing our efficiency. We also aim to continuously drive digitalization forward. Especially interesting for us is predictive process monitoring/control. In logistics and mobility, diesel or gas-driven vehicles are being replaced with electric versions.

For a significant decarbonisation, however, more than just optimizations are needed in the production processes. New ways must be found and new processes developed. We are already working on that today and steadily minimising the CO₂-emissions of our production operations with technological innovations.

When it comes to drying technology, we rely on the use of heat pumps and are already testing that very successfully at our plant in Uttendorf/AT. For firing technologies too, we are looking at solutions that demonstrate much better energy efficiency and, on the other hand, replace the combustion of fossil fuels. Potential future energy sources for thermal processes are "green" electricity and "green" gas (hydrogen, syngas or biogas).

To enhance these developments, the framework conditions for supporting the ceramics industry on EU level must become clearer and political framework conditions for the development of the infrastructure for renewable fuels be defined. We are keeping up to date and prepare on these technological topics.

cfi: *In this context, which are the demands you are making towards your suppliers of materials, machines and kilns?*

JR: For Wienerberger, procurement plays a key role in the implementation of the group strategy. We are pushing ahead with sustainability in the entire value chain of our suppliers and are laying the foundations for a greener future.

With regards to decarbonisation we are at a point in the transformation process where we need to find and implement new solutions together with our suppliers. We are convinced that with our expertise in this area we are an important pacesetter and discussion partner for our suppliers and, accordingly, for the entire ceramic industry.

cfi: *What do you think of new material solutions?*

JR: In our own research laboratories and in cooperation with numerous external research institutes and universities we are looking at a wide range of material developments. For certain applications, for example, mud bricks or geopolymers might be an alternative. For the latter, an improvement of the carbon footprint must, however, be evaluated very carefully on account of the necessary additives.

Certainly, ceramics must be fired and this requires energy, but bricks have a very long lifetime and usually at the end of their life-cycle might be re-used as a product again or processed to a secondary raw material (recycling). As part of our sustainability programme 2023, we have set ourselves the goal that, by 2023, all newly developed products should be 100 % recyclable or reusable.

If you compare the CO₂ emitted during the production of bricks with the CO₂ that is saved when these bricks are used in applications (Scope 3 Emission), then already today the balance is not only CO₂ neutral today but even CO₂ positive. Moreover, it should be taken into account that bricks in product application are capable of absorbing CO₂ from the atmosphere and to permanently bond it (recarbonisation). Thanks to their ability to regulate the interior climate, bricks are ideal building materials. Brick walls keep homes warm in winter and cool in summer and are therefore sustain-

able and resource-saving, while creating a pleasant interior climate.

cfi: *What does digitalization mean for your entire business processes with external partners?*

JR: The digitalization projects in production and supply chain mentioned earlier include activities in respect of suppliers and digital solutions for the support of our partners and customers in the construction industry, For instance, with the All4Roof Tool for roof planning or renovation, we have created a mobile design tool for construction engineers or roofers.

At the construction site, topics like pre-fabricated elements and the use of robots are becoming more important. On the one hand, to shorten construction times, and on the other hand, to compensate for the increasing shortage of skilled labour.

cfi: *How is the sustainability programme being realised when it comes to topics like employees and corporate ethics?*

JR: The health and safety of our employees, who are the core of our success, have the highest priority. Job stability and the creation of new jobs, especially in digitalization, are some of the Group's fundamental principles.

For us, the mathematician and data analyst are needed just as much as the geologist or mineralogist, the process engineer, the electrician, the metalworker and the machine operator. Moreover, access to skills development, training and apprenticeships as well as the option for professional to advance the career, diversity and equal opportunities, irrespective of gender, culture, language, religion, age, etc. are promoted.

Together, we want to further develop the traditional material ceramic as a very high-quality building material within the system of the Wienerberger Building Solutions as an attractive building material for climate-neutral building in the future.

The diversity of the natural raw material clay has been impressing people for thousands of years. People feel secure in brick-built homes and enjoy the comfortable indoor climate. Clay building materials provide scope for every idea and give every building a unique, natural and sustainable surface.

cfi: *Thank you for talking to us.* KS

The BRICK BAUHAUS 2050

For resource-friendly, sustainable, healthy-living and climate-neutral construction, a concept was developed that builds on the climate-friendly properties of clay brick, this is the BRICK BAUHAUS 2050. Combined with the right energy supply and building services as well as the selection of a suitable location, this concept can meet requirements for ecological, economic and social sustainability in the lifecycle of buildings as well as those of the European Green Deal.

For us and future generations, the BRICK BAUHAUS 2050 concept secures better and healthier living thanks to its energy performance in the year cycle, clean solar energy and renewable energy technologies, healthy soil, biodiversity, and recyclable products with a long life, contributing to domestic value creation. All these benefits of this brick-built home are summarised in the following.

Ecology

Climate-neutrality

Construction and running of the building cause the emission of so little CO₂ that the forecast global warming caused by our need for living space remains limited to 1,5 °C up to the year 2050.

Climate resilience

The building does not overheat in the summer and is equipped to cope with extreme weather events and energy supply failure.

Nature conservation

Land consumption is optimized, environment impact caused by the manufacture, transport and use of building materials is reduced, green and open spaces are maximised while biodiversity is promoted.

Economics

Regionality and recycling economy

Regional, domestic and recyclable building materials and products are used.

Energy sector coupling

The preferred use of local energy sources, such as solar energy, enables long-term flexibility in the running of the building.

Affordability and economic efficiency

Cost analyses over a period of 100 years, analysis that goes beyond just the costs of construction.

Social quality

Health and comfort

The building provides a pleasant interior climate, supporting the health of its occupants.

Social inclusion, safety and security

The building comprises a mix of different apartments, low-cost and quality living space, providing a safe and secure environment.