



SUSTAINABILITY AT SCHWENK

Information on the business, ecological and
social environment of our building materials

Reporting year: 2021
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Foreword

Dear readers,

The transformation to increased sustainability shapes our daily thoughts and actions. We are proud of what we have achieved and highly motivated to drive the change forward with all our might. For us, sustainability is not just a current trend, but the basis for future-oriented business and long-term success in our company and in society.

As a family business in its fifth generation, we have always had future generations in mind when making our decisions. We are continuously working on the development of climate-compatible processes, products and solutions with an eye for quality and innovation. We do not just incorporate our value chain as a manufacturer of building materials into this process, we also integrate additional activities such as environmentally-compatible transport, agriculture and forestry as well as reforestation into our sustainability concept.

We take our responsibility for people, nature and the environment seriously, concentrating on vital topics such as employee health, sustainable supply and conservation of raw materials as well as climate protection. With regard to sustainability, we endeavour to set standards in technology and to do more than simply comply with legal regulations and requirements. We have shown that we can fulfil this aspiration in the past through our pioneering work on the introduction of new technologies such as SCR, DeCONOX and ExMercury equipment. We are also continuously driving forward the use of alternative fuels taking a leading role on this within our building materials group.

The global reduction of CO₂ emissions is one of the central challenges of our age and requires political, business and technical solutions. We are determined to be part of the solution and will continue our contributions towards this end. Our goal is to be CO₂-neutral by 2050. The construction of a CO₂-neutral cement plant is a significant milestone on the path to a technical solution. We plan to achieve this target by 2030.

However, this can only be achieved with sufficient amounts of renewable energy, fair competitive conditions and appropriate infrastructure for the storage and/or use of CO₂.



Picture: Thomas Spannagl | SCHWENK

In parallel to the above, we are also working intensively to reduce our CO₂ emissions throughout our whole value chain. Therefore, we are dedicating substantial financial resources combined with our total commitment to preparing the path for future generations in the company and in our society.

In the following pages, you can read about our current and future approach to these challenges.

Do you have any feedback? We looking forward to hearing about your ideas.

With best wishes,

Thomas Spannagl
CEO

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About this sustainability information

Sustainability is a permanent component of our corporate strategy. It is a broad field and is reflected in a very wide range of areas and tasks at SCHWENK. In our first group level report "Sustainability at SCHWENK", we consolidate and describe our diversity in sustainability commitment for the 2021. The report is intended in particular for our employees, our customers, and interested trade professionals.

References to persons in the following text always refer to all genders.

The following pages describe both well-known and completely new applications and solutions. We consider that it is important to describe sustainability holistically and to present both background and context.

Our focus for 2021 is on the SCHWENK Building Materials Group in Germany, Northern Europe and Lithuania and covers the four divisions of cement, sand & gravel, concrete and pumps. We also select specific topics in different divisions for more detailed discussion. This offers a more in-depth view of the different areas of our supply chain.

On our focus pages, our employees provide answers to current urgent questions in the form of interviews.

This sustainability information has been compiled and designed primarily by an internal project team with the support of various divisions. This information will be updated or re-issued on an annual basis.

The project team

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- Thomas Spannagl CEO SCHWENK Building Materials Group
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- Giedre Kundrotiene Legal and HR Director Lithuania
- Artūras Zaremba CEO SCHWENK Lithuania
- Dr Hendrik Möller Member of the Executive Board
- Dr Markus Schauer Technical Manager Raw Materials Supply/ Environmental Protection
- Michael Schmitt Technical Manager Integrated Management System (IMS)

THE SCHWENK GROUP



Picture: Headquarters Ulm | SCHWENK

GENERAL INFORMATION

SCHWENK was founded in Ulm in 1847 making it one of the oldest family-owned companies in the German building materials industry. Our core business is divided into four divisions: cement, sand & gravel, concrete and pumps.

The constituents of our building materials are limestone, crushed rock, sand and gravel. We procure our raw materials primarily from our own deposits and extraction sites. Together they form the basic ingredients for manufacturing concrete. When combined with our concrete pumping services and our high-quality consulting services, we can supply a complete range of services for our customers.

Internationally, SCHWENK is represented on the market by a large number of partnerships and subsidiaries: They form a wide-ranging portfolio – from suppliers of building materials through research companies to the farming and agriculture business.

Our business divisions



Cement



Sand & Gravel



Concrete



Pumps

SCHWENK GLOBAL

Along with our partnerships we are present in many European countries and also in Namibia.



■ Participations at and over 50% ■ Participations over 25%



OUR COMPASS

ONE GOAL - ONE DIRECTION

The compass symbolises our common understanding of the vision, mission and values described below. Our vision defines the goal that we want to achieve by implementing our mission. Our values, built on the foundation of a family business, are firmly rooted in our daily actions.

Picture: SCHWENK employees | SCHWENK

OUR UNDERSTANDING

VISION

Sustainable building solutions for generations to come

MISSION

To develop net-zero CO₂ products and processes with our partners by combining excellent people with innovative technology.

Values



FOR FUTURE GENERATIONS



TWO STEPS AHEAD



MORE THAN THE SUM OF OUR PARTS

FOUNDATION

Family values:
responsibility, honesty, trust and mutual support

STRATEGY

Corporate strategy and outlook

As a family business in its fifth generation, we are aware of our responsibility towards people, nature, environment and climate. We think across generations and place particular focus on the sustainability of our building material solutions.

Our core market is Europe - where we combine our strengths in the various regions to offer high-quality solutions for our customers. To this end, our cement, sand & gravel, concrete, and concrete pump business units operate in a vertically integrated value chain and create synergies.

With our selected investments in research and development, it is our aim to stay an innovation leader in the industry. In cooperation with universities and science centres, we are working on the development of future production processes and emission reduction technologies. At the same time, we are continuously investing in our business units to further increase efficiency on the basis of the latest technologies

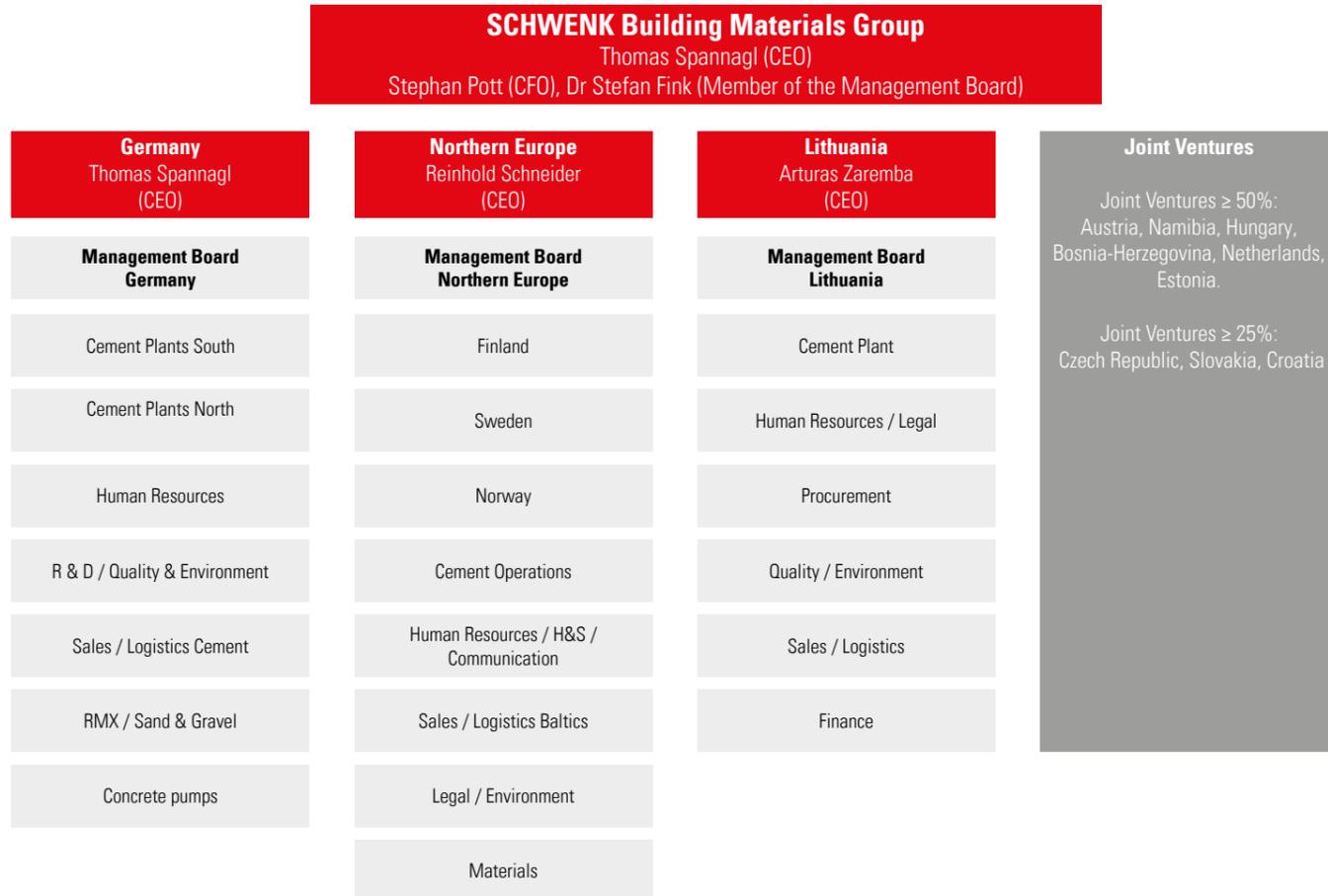
and to achieve our targeted climate goals. We build trusting and open relationships with communities and stakeholders and place great importance on qualified and motivated employees as the core of our success.

Governance structure

The SCHWENK Building Materials Group has grown continuously over many years. Today, it comprises a large number of shareholdings and subsidiaries with a focus on Europe.

The SCHWENK Building Materials Group has a decentralised structure, with local managers in the individual regions. The regions are each structured according to business units. Flat hierarchies and lean organisational structures support rapid decision-making processes and fast implementation.

COMPANY STRUCTURE

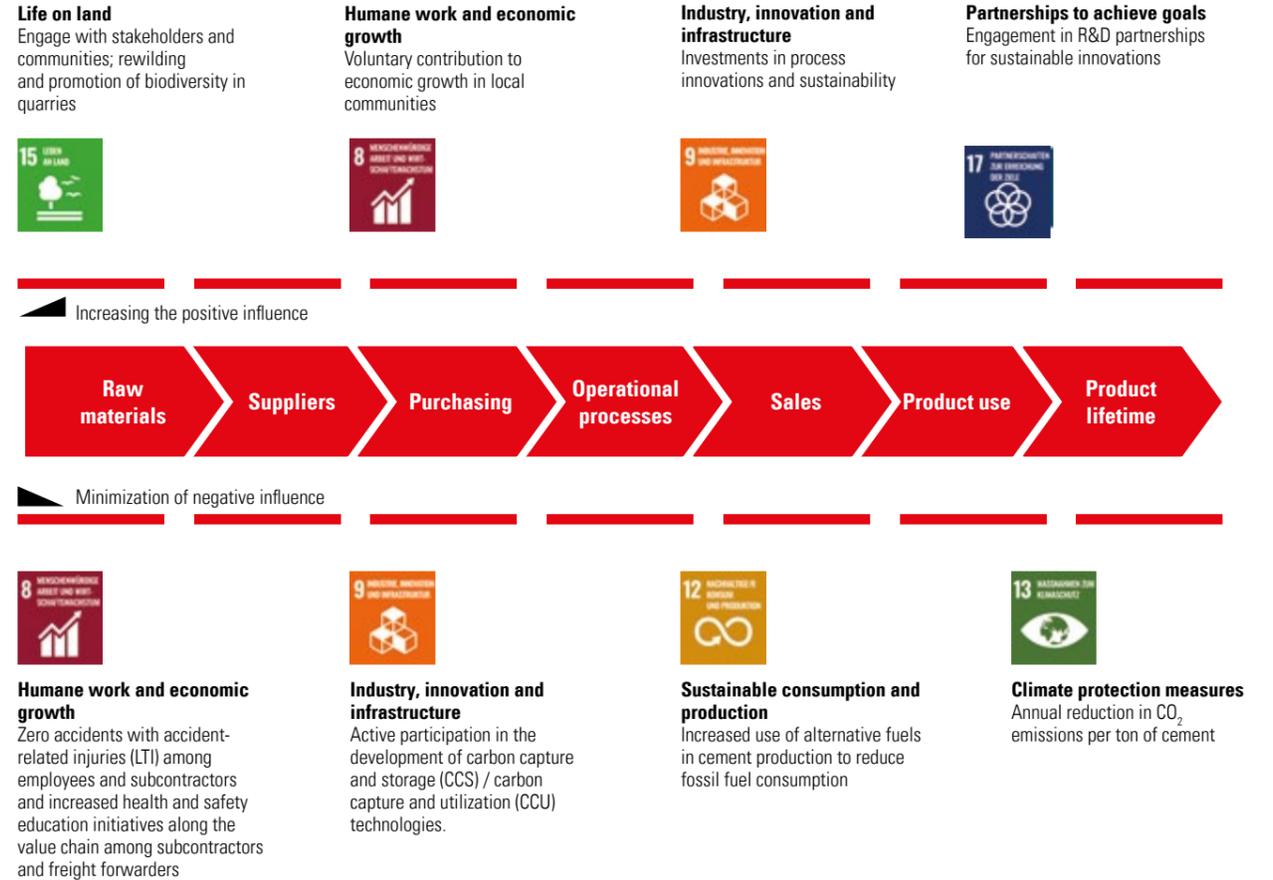


SUSTAINABILITY GOALS

With our vision, mission and values, we also support all 17 UN Sustainable Development Goals (SDGs). In line with our sustainability goals, we focus on seven main topics which have been defined and elaborated by an internal working group.



Picture: UN Sustainable Development Goals, SDGs | www.bmz.de



COMPLIANCE – HAND-IN-HAND WITH OUR PRINCIPLES

You can use the contact form on our website to send questions or suggestions to us at any time.

Picture: Cement Plant Broceni | SCHWENK

Compliance with legal and internal company regulations

For us, general compliance with all legal and regulatory requirements as well as internal company regulations is key. We expect the same from our partners. The good reputation of our company is based on moral and ethical behaviour and fair competition.

Management requires both employees and suppliers to refrain from participation in any form of corrupt practice, such as extortion, fraud or bribery. Our compliance directives include detailed instructions for action.

COMPLIANCE MANAGEMENT SYSTEM



MANAGEMENT SYSTEMS

The integrated management system as the hub

Our integrated management system (IMS) regulates all processes, instruments and sequences in the company. The system is based on DIN EN ISO 9001 (Occupational health and safety), DIN EN ISO 9001 (Quality), DIN EN 197-2 (Product), DIN EN ISO 14001 (Environment), DIN EN ISO 50001 (Energy) and the monitoring regulations for monitoring and reporting CO₂ emissions. Certifications of the systems set a standard at SCHWENK. The standard is checked, assured and continuously improved by internal and external audits.



MANAGEMENT OF RISKS AND OPPORTUNITIES

The internal early warning system

Our risk management is based on a careful weighing up of business opportunities and risks. It is an important tool for the early identification of factors that could lead to deviations. Our risk management, therefore, is a basic prerequisite for the derivation and implementation of preventive measures. In principle, we consider various external influencing factors when weighing up opportunities and risks.

- Economic developments: Willingness to invest in the construction industry as well as economic developments and cost drivers such as energy prices.
- Procurement markets and supply chains: Availability of raw materials, operating supplies, energy, fuels, personnel, spare parts, etc., as well as the availability of new products and services. Supplier structures and logistics partners.
- Legal framework: Compliance and adherence to regulations and laws as well as changing legislation.
- Technological developments: New processes, CO₂ reduction technologies and process optimization.



AUDIT AND CONSULTATION

The basis for compliance with specifications and continuous improvement

Our internal auditing departments see themselves as service providers for the SCHWENK Building Materials Group. Their objective is to support the management of the various entities to meet their specifications and targets, to increase efficiency, economy and returns and to secure company assets. So they work with the organisation to achieve the targets. They apply a systematic and targeted approach to evaluate and optimise the efficiency of the auditing mechanisms and management and monitoring processes.



TRAINING AND E-LEARNING

Internalising and living the defined actions and regulations

Regular training combined with e-learning ensures that our employees are continuously familiarised with all currently valid compliance rules. We support active continuing education activities and are consistently expanding our offerings in IT-based continuing education and training.

GROUP STATISTICS

Our business, ecological and social statistics are based on the SCHWENK Building Materials Group in Germany, Northern Europe and Lithuania.

OVERVIEW OF OUR DIVISIONS

We invest continuously in our plants and equipment. In 2021, we invested approximately

40.3 million euros



CEMENT

6+1 plants

6 fully integrated cement plants and 1 grinding plant.



SAND & GRAVEL

10 plants

10 sand & gravel plants as well as numerous shareholdings.



CONCRETE

139 plants

139 ready-mix concrete plants as well as numerous shareholdings.

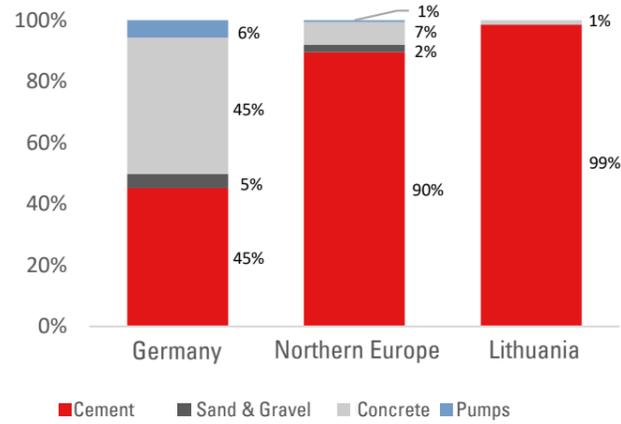


PUMPS

203 vehicles

203 concrete pump vehicles as well as numerous shareholdings.

Percentage share of the divisions in total revenue for 2021



Sales	2019	2020	2021
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Germany

Cement	3.8 million t	4.1 million t	4.0 million t
Sand & Gravel	3.1 million t	3.0 million t	2.7 million t
Concrete	3.9 million m ³	3.9 million m ³	3.7 million m ³
Concrete pumps	3.5 million m ³	3.4 million m ³	3.1 million m ³

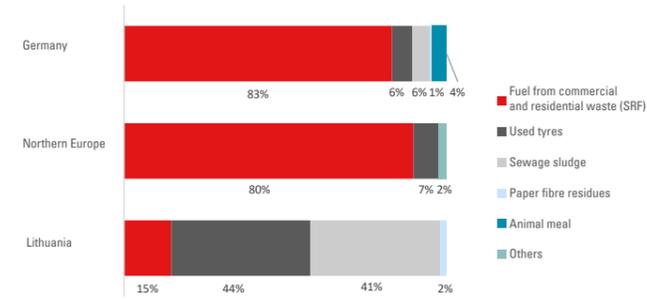
Northern Europe

Cement	1.6 million t	1.5 million t	1.5 million t
Sand & Gravel	0.8 million t	0.7 million t	0.8 million t
Concrete	0.2 million m ³	0.1 million m ³	0.2 million m ³
Concrete pumps	0.1 million m ³	0.1 million m ³	0.1 million m ³

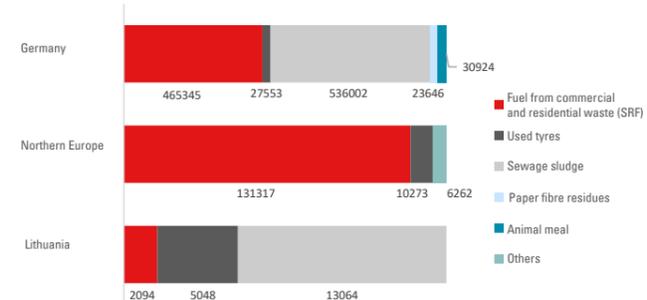
Lithuania

Cement	-	1.2 million t	1.4 million t
Sand & Gravel	-	-	-
Concrete	-	0.05 million m ³	0.02 million m ³
Concrete pumps	-	-	-

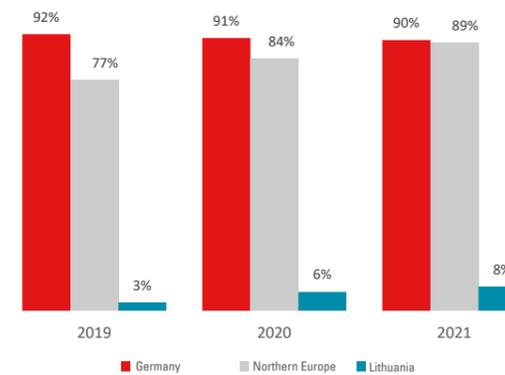
Alternative fuel mix in clinker production based on fuel energy consumption in 2021 as a percentage.



Alternative fuel mix in clinker production based on volume input in 2021 in tons



Development of alternative fuel consumption based on fuel energy consumption



CLIMATE PROTECTION INDICATORS

See also: Climate protection p 24

	2019	2020	2021
Germany			
Specific net CO ₂ emissions (per ton cement equivalent)	435	432	438
Specific net CO ₂ emissions (per ton clinker)	528	534	537
Clinker/cement factor	79.7%	78.7%	79.4%
Proportion of alternative fuels	92.3%	91.0%	90.3%
Proportion of biomass	31.6%	31.0%	32.1%

Northern Europe

Specific net CO ₂ emissions (per ton cement equivalent)	543	512	495
Specific net CO ₂ emissions (per ton clinker)	606	578	569
Clinker/cement factor	89.6%	88.6%	87.0%
Proportion of alternative fuels	77.0%	84.1%	89.5%
Proportion of biomass	35.1%	39.4%	44.7%

Lithuania

Specific net CO ₂ emissions (per ton cement equivalent)	788	730	738
Specific net CO ₂ emissions (per ton clinker)	891	837	837
Clinker/cement factor	87.7%	86.6%	86.1%
Proportion of alternative fuels	2.8%	6.3%	8.1%
Proportion of biomass	1.0%	4.0%	5.0%

FIRMLY ROOTED

How the new agriculture and forestry company combines many years of tradition at SCHWENK.

An interview with Wolfgang Monz, authorised representative of Agrosilva GmbH & Co. KG.

If you take a look at SCHWENK companies one name in particular stands out – Agrosilva GmbH & Co. KG. What is behind Agrosilva and how long has this company existed?

Agro stands for fields, pastures, land ownership, farmlands – the agricultural part. Silva translates as forest, tree, timber and thus covers the forestry part. Agrosilva is a 100% subsidiary of SCHWENK and is still very new. The idea of establishing a separate company came up in 2019. The company was registered on 3 March 2020.

A building materials company with an agricultural and forestry company. Is that a good match?

SCHWENK has had a forestry operation for around 20 years. Establishing a company was simply an extension of that. In addition, all generations of our owners are and always have been very attuned to nature. Their principles also define the company. This means that nature, agriculture and forestry have always been a permanent component of SCHWENK.

A building materials company such as SCHWENK produces a large amount of CO₂. Does Agrosilva help to compensate for this?

The company was not established to compensate for the CO₂ emissions at SCHWENK. However, our agriculture and forestry

business does make a small but important contribution – particularly in the context of the climate discussions within our building materials group.

Agriculture and forestry is the only sector in the group that binds net CO₂ and thus removes it permanently from the atmosphere. Plants and reforestation are one of the factors involved in this. The other factor is the soil, which permanently binds the carbon dioxide in the humus. Our sustainable forestry and the annual growth in our forests absorbs around 10-15 tons of CO₂ per hectare and year.

The build-up of humus, which is even higher on farmland than on the forest floor, permanently removes 2-3 tons of CO₂ per hectare and year from the atmosphere. This means that our total absorption rate per year is around 24,000 to 25,000 tons of CO₂. That is about as much as the entire SCHWENK fleet emits over all divisions including quarry vehicles, our mixer trucks, other trucks, pumps and business vehicles. In view of the above, it can be said that the SCHWENK fleet is CO₂-neutral.

Why do you consider Agrosilva so special?

Well, in the first place I find it very exciting that this company can be part of a large building materials group such as SCHWENK. As I noted at the beginning, it is not a separate component but is closely connected to the principles of the entire group. We are given full support for the structure and its continuing development. Our agricultural and forestry activities are in part linked to activities already conducted by previous generations of our owners. Our shareholder Eduard Schleicher has only recently told me that his great-grandfather, Kommerzienrat Dr.-Ing. e. h. Carl Schwenk, owned a working farm in Blaustein. This means that Agrosilva is following an old tradition.

What topics are you currently focusing on?

Among other things, we are currently working on internal processes to optimise our structures and improve the already very high animal welfare standards as well as the satisfaction of our core staff. We are also expanding the regenerative form of farming in conjunction with targeted feeding in the dairy sector.

Recently, we launched a field trial in the area of aerobic agricultural management, which aims to convert organic manure from animal production in such a way that the organic matter content of soils on our farmland increases at an above-average rate. On the one hand, this results in higher water and nutrient storage and on the other should definitely lead to significantly higher permanent CO₂ sequestration in our soils.

The Oberschelklingen farm is also part of Agrosilva. Can you tell us a bit more about this?

The farm in Oberschelklingen has been part of Agrosilva since 2021 and is an essential part of our agricultural business. Attached to the farm is the newly remodelled Schelklinger farm shop. There we sell our own and other home-made and regional products exclusively. The Schelklinger farm shop is run by the St. Konradhaus Foundation. We have also installed a photovoltaic system of almost 2,000 m² on the farm property, which produces enough renewable electricity to supply most of the farm.

If you look five years into the future - what are the big issues at Agrosilva?

The Company will continue to be strategically and economically aligned. For us, the aim is continuous and sustainable growth.

That sounds exciting. Thank you Mr. Monz for these insights and good luck for the future.

With pleasure and many thanks for the good wishes.

Interview: May 2020

Update: October 2022



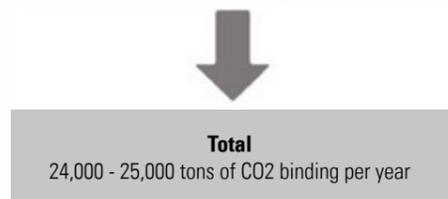
Picture: Wolfgang Monz | SCHWENK

Agricultural business - plant production
1,500 tons of CO₂ binding per year



Sustainable forest management
18,000 tons of CO₂ binding per year

Soil and humus
4,900 tons of CO₂ binding per year



Our forests **compensate for approx. 24,000 tons of CO₂** annually, which is approximately as much as the amount emitted by the complete SCHWENK fleet of vehicles. Mathematically speaking **this makes our fleet CO₂-neutral.**

PRODUCTION



Picture: Collage of all business units | SCHWENK

SECURING AND CONSERVING RAW MATERIALS

The manufacture of cement and concrete requires raw materials such as limestone, aggregates, gravel and sand. The spatial distribution and quality of the raw materials are essential components in our strategy for the supply and conservation of raw materials.

We find our raw materials through geological exploration using digital methods of mapping and analysis. Methods such as 3D mapping using drones and photogrammetry, exploratory drilling with geochemical analysis and the calculation and visualisation of deposit models are only some of the technologies that we use. The resulting knowledge of the spatial distribution of deposits enables us to contact landholders and licensing authorities at an early stage and to secure the deposits for the long term.

Competing claims for usage, even in areas with high-quality raw materials, are increasingly restricting and endangering the availability of raw materials. Sand and gravel deposits in particular, which are used as raw materials for the manufacture of concrete, are likely to become increasingly scarce in the short and medium term with a restriction on the number of deposits available for raw materials extraction. Our usage of natural resources is increasingly based on the application of technology that enables us to use the available raw materials in our quarries to the fullest possible extent. This includes the use of online analysers for quality control and mixing beds for homogenisation of the raw material for our cement plants. We also use rock crushers in our gravel plants to make full use of oversized rocks.

ALTERNATIVE RAW MATERIALS

At SCHWENK we have been able to replace more than 10% of natural raw materials with alternative materials. They are combined with the natural raw materials to ensure that they meet our high quality standards. This conserves natural raw materials and closes material cycles. Examples of alternative raw materials include used foundry sand, sludge from processing potable water supplies and also calcined limestone from soda production.

■ See also: [Climate protection](#) | [Raw materials](#) p. 25

ADDITIONAL COMPONENTS

Additional components for the production of cements with reduced clinker content include not only natural raw materials such as limestone or pozzolan but also alternative components such as fly ash from power plants or granulated slag from steel production.

>130 years

This is the number of years for which raw materials in our quarries will be available. This kind of long-term thought and action create security and predictability – also for the regions around our sites.

SECURING RAW MATERIALS

The manufacture of one ton of cement requires up to 1.5 tons of raw materials. Only a small number of geological deposits with the chemical and mineralogical quality and long-term availability is suitable for cement production. For this reason, securing these local deposits for the long term has top priority at SCHWENK.

Our five principles:

- Proactive geological exploration
- Securing ownership at an early stage by purchase or excavation contracts
- Spatial planning safeguarding in regional raw material planning programs
- Transparent approval processes with consultation of the local population at an early stage
- Prompt rewilding of excavated areas

CONSERVING RAW MATERIALS

Deposits of natural cement raw materials are local in nature and thus finite and cannot be replicated. This is why we do all we can to conserve these resources as long as possible. We want to ensure that they can be used by future generations.

Our actions for conservation of natural raw materials:

- Developing products and production methods with reduced raw materials requirements
- Using alternative raw materials
- Using excavation and processing technologies to minimise the unusable portion
- As complete as possible utilization of the raw materials

IN HARMONY WITH NATURE

FROM EXCAVATION TO RESTORATION

LAND USE AND BIODIVERSITY

The removal of raw materials in our quarries and mines is a short-term land use. However, it always involves significant encroachment on nature and the landscape. It may also have a detrimental effect on the local population. When we submit an application to open a quarry, consultation with the local population - at the earliest possible stage - is very important to us.

We consider suggestions and objections from local people at information meetings and work with them to develop environmentally compatible quarrying processes. The required approvals and licences are then obtained in close consultation with the relevant approval authorities. The process is based on the applicable legal regulations for protection of the environment.

CONCEPTS FOR LIMITING ENCROACHMENT ON NATURE AND THE ENVIRONMENT

Quarry projects involve encroachment on nature and the landscape that could last for several decades. For this reason, we implement concepts for mitigation which include measures to promote the protection of nature and biodiversity during the operational phase. We make an effort to keep the area required for our work as small as possible. So we make an effort to use the natural raw materials as fully as possible and we try to use alternative raw materials.

AFTER-USE - RECULTIVATION AND RENATURING

After-use of our quarries is defined in the form of a landscape conservation plan at the initial planning stage for a new quarry. The plan includes a schedule and objectives for recultivation and renaturing.

Landscape conservation plans are prepared for all of our quarries. Our many decades of experience in working with this type of planning has shown that technical and natural conditions tend to develop dynamically and are continuously changing during the operational phase of a quarry project. Therefore, we have developed dynamic concepts at specific sites to define targets for after-use and we have been able to implement them successfully.

Plans for after-use over a manageable period of a few years are defined in the course of regular inspections with licensing authorities and nature conservation organisations. We also include options for modifying plans based on the dynamics of natural developments. We are sure that such concepts will become increasingly significant – particularly when the speed of climate change is considered.



After-use: Solar panel system in the Darast gravel pit



After-use at the Riedheim gravel pit



Result of a dynamic after-use plan with the example of the Mergelstetten quarry

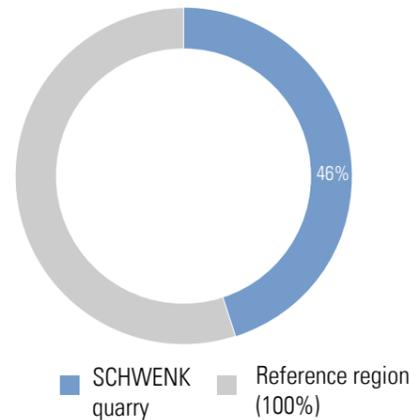


Renaturing of the Aufhausen quarry

NATURAL HABITATS FOR ENDANGERED ANIMALS AND PLANTS

CONSERVATION OF NATURE AND WILDLIFE IN OUR EXTRACTION SITES

Operating quarries and sand and gravel pits provide space for endangered animals and plants even during their operating phase. We regularly record biodiversity data for use in preparing biodiversity management plans to determine the biodiversity values of our extraction sites and to develop measures for the promotion of species protection. We also initiate and promote a range of projects for species protection.



We currently have an average of 385 species of plants recorded in our quarries. This makes up around 46% of all plant species that could be found in the relevant reference region (Ordnance survey map TK25), although the area occupied by all our quarries makes up less than 1% of the total area of this region. Our quarries therefore represent a hot spot for biodiversity.



Dr Markus Schauer, Technical Manager Raw Materials Supply/Environmental Protection | SCHWENK

“TEMPORARY NATURE”

Over the total lifetime of our extraction sites specific areas tend to develop where no quarrying operations take place for several years. Endangered species and habitats that can no longer find living space in the surrounding cultural landscape, get a chance to settle here.

We systematically promote such sites by implementing the concept of "Temporary Nature". This involves exempting areas in the quarries from operational use for several years and identifying them as stepping stone or migratory biotopes. This gives nature time to recover and develop biodiversity. These biotopes and environments migrate in the most literal sense of the word through the quarry over time. This has enabled us to establish environments for the yellow-bellied toad, the sand martin, rare plants such as the sarsaparilla and other species.



REINTRODUCTION OF THE PARTRIDGE

Implementation of a research project with cage breeding and provision of the preferred habitat (open land).



FALLOW DEER PROJECT

We are introducing new methods for the maintenance and development of open-land biotopes in our quarries, such as planting low-nutrient grassland. In this case, we are supporting fallow deer in an area of more than 100 ha.



MONITORING BREEDING BIRDS

Observing spring migrants in the NATURA 2000 site and nature reserve "Sātiņu dīķi" in Latvia to monitor specially protected bird species. In addition to grey geese, pale geese, wild geese and small swans, white-tailed eagles, ospreys and black storks also use the optimal conditions in the nature reserve as resting, feeding and breeding sites.



MONITORING MIGRATORY BIRDS

Monitoring of migratory birds in the autumn in the NATURA 2000 site and nature reserve "Sātiņu dīķi" in Latvia. The nature reserve is also an important place for various migratory birds in autumn. In addition to the spring migrants, cormorants, peregrine falcons, lesser spotted woodpeckers and other bird species can be seen in the area in autumn.



ECOLOGICAL ACCOUNTING PROJECTS

We are supporting biodiversity and the establishment of biotope networks with various projects such as the maintenance and development of mixed orchards and the development of wildflower strips, meadows and hedges in neglected fields.



MONITORING THE YELLOW-BELLIED TOAD

Our quarries are preferred habitats for the yellow-bellied toad. We continuously record developing migratory biotopes to enable biotope development and quarrying operations to co-exist.

Our main levers

for climate protection and energy efficiency are



Raw material



Fuel



Processes and innovations

CLIMATE PROTECTION

As producers of building materials such as cements, special building materials and concrete we are part of resource and energy-intensive primary industry. Our manufacturing processes, particularly the cement clinker production, is connected with CO₂ emissions. The cement industry throughout Germany annually emits approximately 20 million tons of CO₂. Efforts have long been underway to reduce CO₂ emissions for the sake of climate protection. The Kyoto protocol defines three mechanisms for reaching global climate protection targets. The best-known mechanism is emissions trading, which is regulated by an EU Directive for companies in Europe. A number of emissions permits is allocated to specific types of industry and is reduced from period to period. Companies that have already made great efforts for climate protection can sell excess permits.

If the allocated number of permits is insufficient to meet commitments, emissions permits must be purchased. We calculate annual CO₂ emissions and prepare emission reports for our cement plants based on the EU monitoring directive and monitoring plans. We surrender the corresponding number of emissions permits via our emissions trading accounts in accordance with verified emissions reports. Our target is to reduce CO₂ emissions by 200 kg CO₂/t of clinker from 1990 to 2030. By decreasing the proportion of clinker in the cements over the same period we aim to reduce specific CO₂ emissions per ton of cement equivalent by 38%. By 2019 emissions had already been reduced to 21%.



RAW MATERIAL

What is SCHWENK doing to conserve natural raw materials and to close the material cycle in meaningful way?

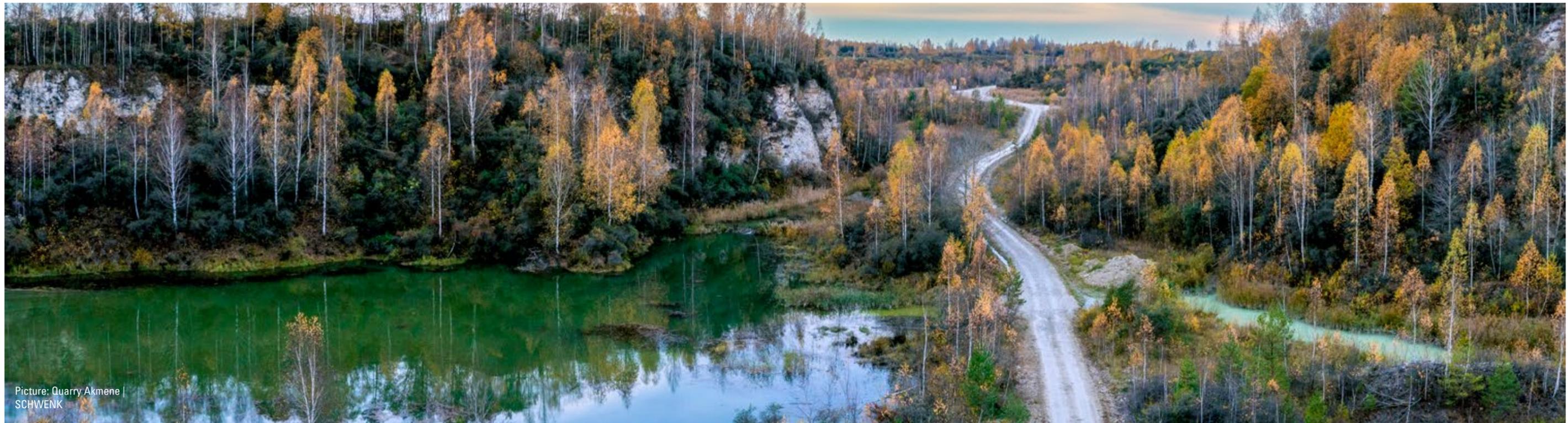
The manufacture of cement and concrete requires high volumes of natural raw materials. They are obtained by excavating the primary material required from quarries or sand and gravel pits. These materials are the main basis for the production of cement and concrete. Because natural deposits are finite and also for ecological reasons, alternative raw materials and ash from alternative fuels are becoming increasingly important. At SCHWENK we have replaced more than 10% of natural raw materials with alternative materials. They are combined with the natural raw materials in such a way that we can maintain the high quality of our products. The addition of alternative raw materials not only saves natural raw materials and closes material cycles, it also reduces CO₂ emissions.

MORE THAN 10%

of natural raw materials for cement manufacture have already been replaced at SCHWENK by alternative substitute materials.



Picture: Quarry mining Broceň | SCHWENK



How does the use of alternative raw materials reduce CO₂ emissions?

Approximately two thirds of CO₂ emissions in the cement manufacturing process are due to the raw materials. The emissions are already contained in the limestone. The first stage of cement manufacture is to calcine the limestone to form clinker and then grind the clinker to cement. The following two options are available to save on CO₂ emissions: see graphic.

Use of alternative raw materials in clinker production

With the rotary kiln, cement production includes a high temperature process. A wide range of very different raw materials is completely decomposed, melted and converted to new mineral phases at extremely high temperatures (approx. 2,000 °C gas temperature and approx. 1,450 °C material temperature). Limestone (CaCO₃) is the most important raw material for clinker production. The integrated CO₂ is released during the calcination process. This is referred to as “decarbonisation”: CaCO₃ becomes CaO and CO₂. Alternative raw materials, which are already “decarbonised” and thus contain less or absolutely no CO₂ in the starting material do not release CO₂ in the clinker burning process.

Clinker producers should preferentially use this process for reasons of environmental protection. So long as the chemical composition of the starting and ending materials – with reference to the chemistry of the fuel ashes – meets the requirements of the “recipe” for the chemical composition of the final Portland cement clinker, the choice of the type and origin of the raw materials put into the rotary kiln is very flexible. Whether the silicate or silicon components required for the production of clinker come from natural sand from a sand pit or whether used foundry sand is utilised is virtually irrelevant for the chemical composition of the clinker. The natural and alternative raw materials are equivalent in their capacity for use in the extremely high processing temperatures in the rotary kiln, so long as the chemical composition is comparable. Unfortunately, the availability of calcium oxide-containing alternative raw materials that also contain no or little CO₂ is very limited.

For this reason, SCHWENK selects sites that have access to sources of appropriate alternative raw materials such as used casting sand, broken concrete from roof tile production, filter dust from steel manufacture or residual materials that contain aluminium. Materials of this type have already been in use for clinker production for many years. The preconditions for technical and legal approval for the use of alternative raw materials must of course be in place.

In this context, our Bernburg site has a special feature. We share a quarry with SOLVAY AG, a manufacturer of soda. Soda manufacture requires CO₂, which is produced from limestone in the SOLVAY process. The remaining CaO, referred to as limestone lenses, is used in the Bernburg cement plant with limestone to produce clinker. Exploitation of the synergy of two completely different industrial processes has enabled the Bernburg plant to reduce its CO₂ footprint in clinker production to the lowest specific level of all SCHWENK cement plants.

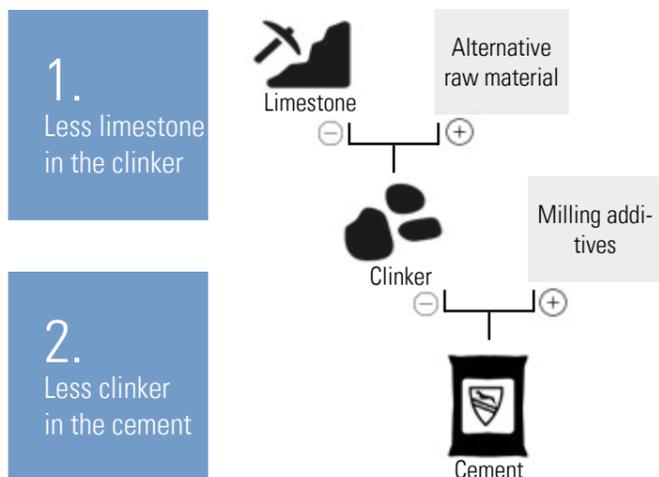
Use of secondary cementitious materials

A high-temperature process is not required for grinding cement clinker with a wide range of granulates. In addition to clinker, limestone meal, gypsum, fly ash, granulated slag, natural pozzolan or volcanic ash are the most important materials for grinding cement. Almost nothing is changed other than the fineness. And incidentally, materials that can no longer be used in their own material cycles are added to the material cycle of building materials production.

This additional use saves valuable resources. The substitute materials used for cement manufacturing must therefore be subject to strictly defined quality standards before they can be used. So the options for the use of alternative raw materials in cement grinding are significantly more restricted compared to clinker production. The regional availability of the additives is the deciding factor in the

manufacture of cement with the lowest possible proportion of clinker. SCHWENK is also experimenting with different processes in this area. We are conducting research projects to test the suitability of very fine material from concrete recycling (RCF= recycled concrete fines or crushed concrete) as an alternative milling additive.

Other projects have already demonstrated that innovative recycling processes for used concrete (referred to as electrohydraulic pulsing) can be used to separate the additives (gravel and sand) in used concrete completely from the cement matrix (bonded hardened cement). The sand and gravel recycled in this way can be used for manufacturing concrete. The remaining cement stone can be used in the rotary kiln calcination process and also in cement grinding.



IN THE LEAD

The use of alternative fuels at SCHWENK is the rule, not the exception. We have been leaders in the cement industry in this field for many years.

We have now replaced more than 90% of natural fuel coal with alternative fuels in all our German plants. This has enabled us to save many millions of tons of CO₂ over the years. This has also helped us remain competitive.

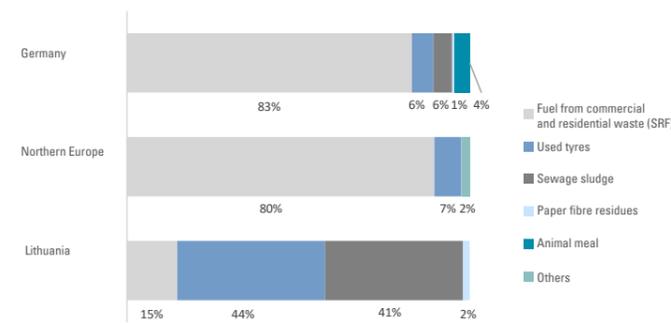
We also aim to maximise the use of alternative fuels at our plants in Northern Europe and Lithuania. Since acquiring a majority shareholding in Lithuania in 2020, we are developing the site to continuously increasing alternative fuel use.

FUEL

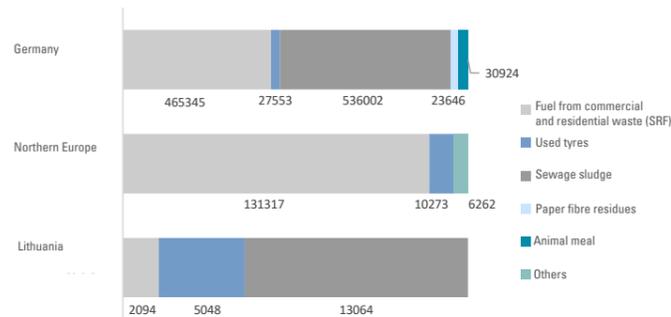
CO₂ emissions are generated in the rotary kiln during the clinker calcination process by the use of energy from the fuel to generate the processing heat. This forms approximately one third of CO₂ emissions in the cement manufacturing process. The use of alternative fuels replaces fossil energy sources such as oil, natural gas or coal. With high biogenic proportions, they contribute to the reduction of CO₂ emissions and thus to protection of the climate.

Alternative fuels include dried sewage sludge or fuels derived from commercial and residential waste (SRF). Organic pollutants are burnt completely at temperatures over 2000 degrees Celsius. The mineral components from the ash are completely integrated into the cement clinker and help to save natural raw materials. This means that the fuels used in cement manufacture are fully utilised not only for their energy content but also for their material content.

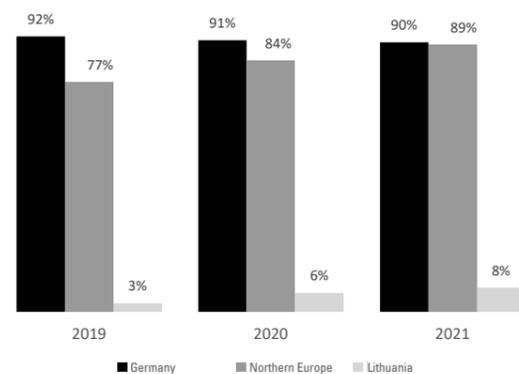
Alternative fuel mix in clinker production based on the fuel energy consumption in 2021 as a percentage



Alternative fuel mix in clinker production based on volumes used in 2021 in tons



Development of alternative fuel consumption based on fuel energy consumption



What is the difference between an “alternative fuel” and “waste/refuse”?

Alternative fuels are accurately composed mixtures of specially sorted and prepared waste streams (for an optimal combustion process and thus a consistently high-quality product). They enable the recycling of energy and materials. The biogenic proportion also improves the environmental footprint.

The latter aspect has become more important in emissions trading, particularly in recent years, something that is not common knowledge. The deciding factor is whether the fuel components consist of biogenic (renewable) materials (paper, cardboard, wood etc.) or residues derived from crude oil (such as plastics). The higher the biogenic part of the alternative fuel (wood, paper, cardboard, natural rubber, animal fat etc.) used in the rotary kiln, the higher the improvement in environmental footprint in terms of CO₂. In addition to the absolute quantity of fuels that we use in the rotary kiln, the biogenic proportion of the fuel has become very important for the economical operation of our plants and to keep them as climate-neutral as possible.



Used tyres
Biogenic component: 27%



SRF
Biogenic component: 26-35%



Sewage sludge
Biogenic component: 75-85%



Paper fibre residues
Biogenic component: 70-90%



Animal meal
Biogenic component: 100%



Waste wood
Biogenic component: 100%

Why does SCHWENK burn sewage sludge?

Sewage sludge from municipal sewage treatment plants was formerly spread primarily on farm fields as fertiliser. However, due to the ever-increasing proportion of questionable content in the sludge, such as drug residues or microplastics, the legislation now favours thermal processing as the best solution. Sewage sludge contains 75-85% biogenic carbon content from paper, soap and digestive products. When dried, sewage sludge has a heating or fuel value equivalent to the brown coal dust that we formerly used as fuel. The composition of sewage sludge fits very well into the “recipe” for clinker production. SCHWENK recognised the economical and ecological benefits of burning sewage sludge in the rotary kiln at an early stage. We have invested in storage capacity, transport, drying and process technology and we are now one of the largest industrial processors of sewage sludge in all of Germany.

In terms of comprehensive utilisation, our company SCHWENK Latvia used, among other things, an organically contaminated soil material - in very small and controlled quantities. The material comes from the restoration of historically polluted sludge ponds. In 2020, the cleaning work was completed and the conditioned sludge was delivered to the Broceni cement plant for further use as an alternative fuel. All the material was safely stored in specially equipped and monitored warehouses and introduced into the clinker burning process during 2022.

What are the limits to alternative fuel use?

Organic pollutants are burnt completely at temperatures over 2000 degrees Celsius. However, not everything that could theoretically be used as fuel in our kilns would be considered practical.

As a result, SCHWENK group management has undertaken not to use fuels containing commonly restricted waste as defined in the CSI Guidelines for Co-Processing Fuels and Raw Materials in Cement Manufacturing.

19.7 million
tons of CO₂
from 8.9 million tons of coal -
This is how much CO₂ or fossil fuel we have saved since 1990 by using our alternative fuels.

536,000
tons of sewage sludge
is incinerated annually, thus avoiding fossil CO₂ emissions of approx.

63,000
tons.
We also help to ensure that no organic pollutants from sewage sludge enter our food chain via the fields.

600,000
tons of SRF
are burnt annually.

In accordance with CSI Guidelines commonly restricted waste includes:

- Electrical and electronic waste (e-waste)
- Whole batteries
- Radioactive waste from the nuclear industry
- Explosives and ammunition
- Corrosive waste, including mineral acids

PROCESSES AND INNOVATIONS

The cement manufacturing process is one of the most energy-efficient industrial processes overall. Average efficiency is around 80%. Compared with the most modern coal-fired power plants with an efficiency of <50% that is extremely efficient. We traditionally use as much as possible of the heat emitted by the combustion process in our plants.



FOR RAW MATERIALS

We use the waste heat from our kiln to dry moist raw materials such as clay, marl or limestone.



FOR FUELS

We also use the waste heat from the kiln in large BGS or sewage sludge dryers to prepare our fuels for use. The dryer they are, the more efficient and consistent they are.



FOR THE NEIGHBOURS

We also do a good deed for the neighbours and the whole community at our plant in Karlstadt near Würzburg with the unused waste heat: we use it to heat the local open-air swimming pool.



FOR ENERGY EFFICIENCY

At SCHWENK, we have an energy team that continuously monitors energy use as part of DIN EN ISO 50001 certification as well as developing and coordinating measures to continuously optimise energy use and reduce the fuels used. All major energy consumers in our plants are equipped with separate consumption measuring devices for this purpose. This enables us to track, analyse, plan and optimise energy consumption in detail.

In addition to reducing specific electricity requirements, the main focus is on improving thermal energy efficiency and reducing CO₂ emissions in clinker production. In this way, specific CO₂ emissions per ton of cement have been consistently reduced in recent years.

Another goal is to continuously increase the amount of green electricity through our own photovoltaic projects and plants for the utilisation of production heat for electricity generation. In addition, we aim to increase the percentage of electricity from green energy sources by participating in new construction projects for the generation of green electricity or by purchasing electricity from renewable generation plants.



Picture: Quarry Bernburg | SCHWENK

INNOVATIONS TO PROTECT OUR CLIMATE

THE TARGET FOR 2050

The long-term target for Germany is to be as carbon-neutral as possible by 2050. SCHWENK accepts this challenge and is taking an active part in various research projects – including projects for the development of innovative binding agents and manufacturing processes.

Celitement

Celitements are high-quality hydraulic binders produced by a patented, energy-efficient process. They are characterised by low limestone consumption and low carbon dioxide emissions during production. We are optimising this new type of hydraulic binder and conducting the first industrial production trials at users' facilities. We use state-of-the-art analytical facilities and benefit from many years of experience in the field of building materials.

■ See also: In focus: CO₂ reduction p. 50

Cement Innovation for Climate

"CI4C" - Cement Innovation for Climate is a joint venture on the part of the four European cement manufacturers Buzzi Unicem - Dyckerhoff, Heidelberg Materials AG, SCHWENK Zement GmbH & Co. KG and Vicat. The aim of this venture is to realise a research project entitled "catch4climate", which will investigate the practical applicability of oxyfuel technology in the cement manufacturing process.

■ See also: In focus: CO₂ reduction p. 50



Picture: DeCONOx plant Allmendingen | SCHWENK

EMISSIONS AND AMBIENT POLLUTION

AIR POLLUTION CONTROL

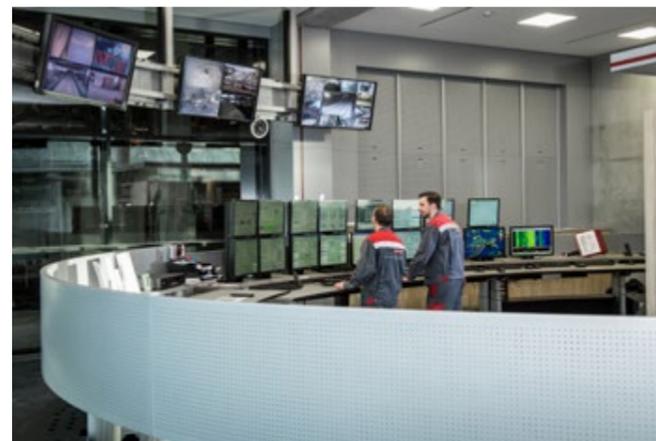
While the excavation and processing of raw materials and the production of building materials primarily produces noise and dust, a number of different air pollutants are also a relevant factor in the kilns of our cement plants. We comply with the legislation for protection of the environment and are subject to close monitoring by the authorities.

We are consistently investing above-average amounts in the best available environmental technology at all our sites. This ensures that our plants' emissions are regularly below the applicable limits and benchmarks. It also means that we are achieving our targets of reducing emissions of air pollutants to below the legally required amount. Our actions are making significant contributions to the protection of health and the climate.

EMISSION REDUCTION TECHNOLOGY

The use of modern fabric filters for removal of dust and the entrapment of dusting aggregates is standard practice in our plants. We use road-watering systems in our quarries to minimise the diffusion of dust. We are also leaders in the development and application of innovative emission reduction technology. This means that we exceed the currently applicable regulations for the use of the best available technology (BAT).

We use SCR plants to minimise NOx and NH3 emissions at our Karlstadt and Mergelstetten cement plants and we also have a DeCONOx system in our Allmendingen cement plant.



Picture: Control room at Mergelstetten | SCHWENK

We not only comply with the valid limit values for all pollutants, we also remain well below them.

Ammonia (NH ₃) emissions in mg/m ³	2019	2020	2021
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Limit value Germany	30	30	30
SCHWENK Germany	10.9	7.8	7.1
Limit value Northern Europe	50	50	50
SCHWENK Northern Europe	1.4	1.7	6.2
Limit value Lithuania	30	30	30
SCHWENK Lithuania	0.6	0.9	0.7

NOx emissions in mg/m ³	2019	2020	2021
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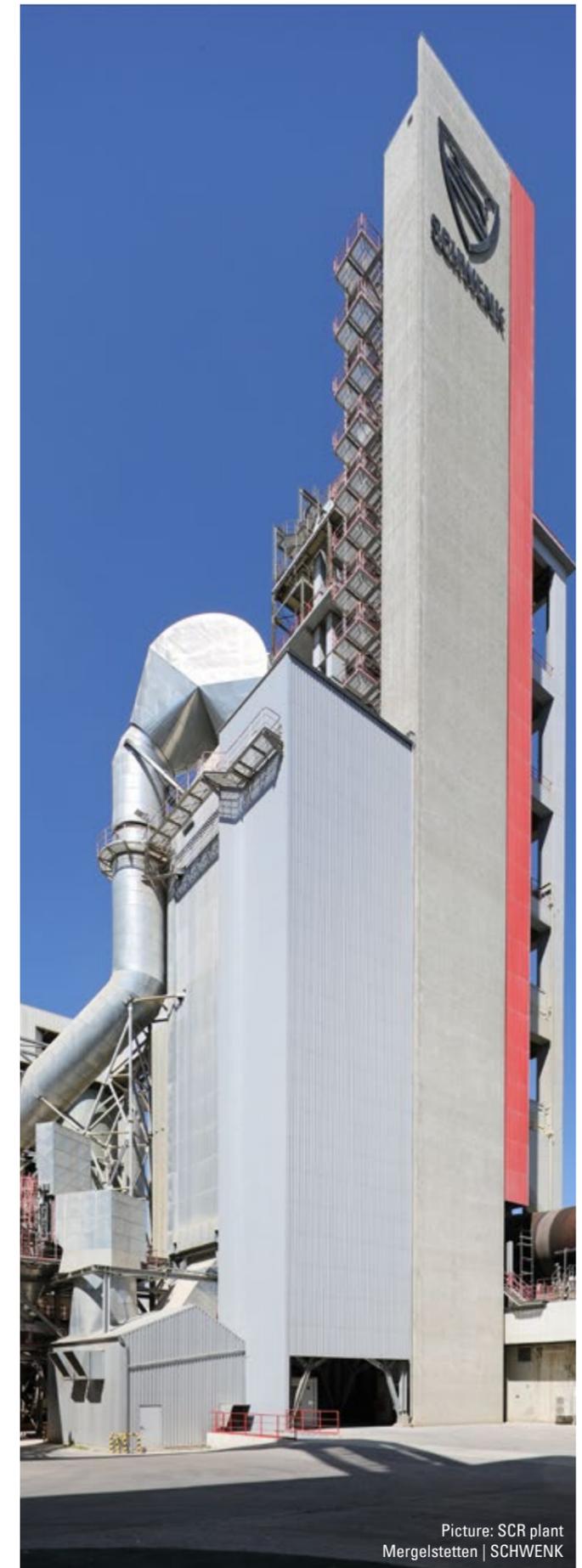
Limit value Germany	200	200	200
SCHWENK Germany	190.8	176.1	183.8
Limit value Northern Europe	500	500	500
SCHWENK Northern Europe	460.6	412.2	399.9
Limit value Lithuania	500	500	500
SCHWENK Lithuania	437.5	330.2	381.3

Dust emissions in mg/m ³	2019	2020	2021
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Limit value Germany	10	10	10
SCHWENK Germany	2.7	4.0	4.0
Limit value Northern Europe	20	20	20
SCHWENK Northern Europe	6.1	6.0	9.0
Limit value Lithuania	20	20	20
SCHWENK Lithuania	2.7	5.1	9.7

Mercury emissions in µg/m ³	2019	2020	2021
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Limit value Germany	30	30	30
SCHWENK Germany	9.7	11.4	8.2
Limit value Northern Europe	50	50	50
SCHWENK Northern Europe	6.4	0.04	0.2
Limit value Lithuania	50	50	50
SCHWENK Lithuania	0.2	0.5	4.1



Picture: SCR plant Mergelstetten | SCHWENK



SUPPLY CHAIN AND LOGISTICS

SUSTAINABLE PROCUREMENT

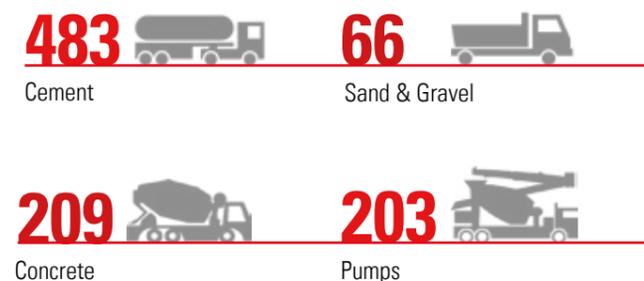
In all procurement processes, the realisation of optimal materials management as well as customer, team and process orientation are guiding principles of our actions. The basic requirement is that the compliance principles of our company, as well as other binding obligations, are observed, while ensuring that environmental protection, occupational health and safety, social aspects, and energy efficiency are taken into account. The responsible procurement of resources is also a criterion in the procurement of raw materials. We require our suppliers to implement suitable measures to continuously improve the principles mentioned above. Furthermore, we reserve the right to terminate the business relationship with a supplier if specifications and regulations are not complied with.

SUSTAINABLE LOGISTICS

SCHWENK focuses on reliable, punctual and cost-efficient delivery to our customers. Even with wide fluctuations in customer demand, we remain a reliable partner with deliveries almost always at the precise time promised. In addition to our strong customer orientation, sustainable logistics has always been one of our principles. This becomes particularly clear in the long-term and diverse relationships that we maintain with our logistics partners.

Our building materials are naturally very heavy. For the sake of sustainability, we try to use barges and rail transport as much as possible to transport raw materials and deliver building materials. We prefer to work closely with local, generally small to medium-sized transport companies for transport by road. The emphasis on local means that in most cases drivers are able to go home to their families at night. Our way of working also strengthens regional economies.

Our transport fleet



Transport by rail

Our subsidiary BELog gives us in-house expertise in rail transport. We are planning to use rail transport more in the future for materials such as sand, gravel, clinker and cement. Our terminal in Rostock harbour allows us to supply our terminals in Norway and Sweden. We are continuously establishing additional supply lines, including to customers with direct rail connections or connections via transshipment rail terminals.

Transport by barge

Our cement plant in Karlstadt has a direct connection to the River Main. We receive important raw materials and ship cement and cement clinker by barge from this harbour. We have maintained a continuing relationship with a number of locally based, in some cases family-owned, shipping companies for many years. In difficult cases, they help us to supply our customers that have access to canals.

Transport by road

Our partly outsourced fleet of silo trailers, tippers, mixer trucks and concrete pumps uses almost exclusively engines that conform to the latest EURO 6 standard. We are already using alternative fuels such as CNG (compressed natural gas) and LNG (liquefied natural gas) in regions with an appropriate network of fuelling stations. We are also considering hydrogen-driven and electric vehicles for short distances and very small loads. Regardless of what type of engines will be used in the future, we are planning a significant expansion of the decarbonisation of our truck fleet.

We use a modern and fully integrated fleet management system that digitally assigns tasks to drivers to optimise our routes and processes. This has significantly improved the speed and flexibility of our logistics. Our order and dispatch receiving system is noted for its closeness to customers. By close cooperation we can avoid unnecessary travel and respond quickly to changes. Modern loading systems also assist us in reducing the transport of "air". They ensure that freight capacity is fully exploited without exceeding the permissible total weight. This enables us to avoid many unnecessary loads, particularly on the road.



BELog train in front of the Bernburg cement plant | SCHWENK



Harbour at the Karlstadt cement plant | SCHWENK



Cement silo semi-trailer at the Broceni plant | SCHWENK



Concrete mixer truck in front of the SCHWENK headquarters | SCHWENK

SELECTION, MONITORING AND ASSESSMENT OF LOGISTICS PARTNERS

Our small to medium-sized logistics partners are selected based on their sustainability. We focus on items such as compliance with environmental standards, safety regulations and identification with our company. We assess our selections once a year and our partners are subjected to a transparent, fair and traceable evaluation. Achievement of the best environmental standard is an important target. To ensure that our partners can maintain a sustainable business, we decided in 2018 to reimburse the costs for the road toll extension and adjustment to the polluter pays principle (i.e. down to the last kilometre) directly to our transport contractors. Only contractors who comply with the EURO 6 standard can take advantage of these cost benefits, establishing another strong incentive for compliance with the latest environmental standards.



SAVING, RECYCLING, UPGRADING

Picture: Alternative fuel SRF | SCHWENK

TWO CYCLES - ONE TARGET

Material cycle: Recycling of building materials that we have produced and processed.

Residual material flows: Recycling residual material flows from other industries that we integrate into our manufacturing process.

RECYCLING ECONOMY

USE OF RAW MATERIALS AND FUELS

When defining the term "recycling economy", SCHWENK distinguishes between the material cycle of recycling the building materials that we have manufactured and processed and the recycling of residual material flows from other industries that we integrate into our manufacturing process. By using alternative raw materials and fuels we can integrate materials that cannot be recycled in their original material cycles into the cycle of building materials production.

Examples of fuels

We recycle short fibres from paper recycling that can no longer be used in the paper and cardboard production cycle. They supply valuable energy. The conversion of these materials to cement clinker moves them into the cycle of building materials production and the subsequent recycling process. The same applies for alternative fuels such as biological sludges, animal and bone meal, old tyres, old plastic and paper and textile residues.

Examples of raw materials

Alternative raw materials include dust from metal manufacturing and processing industries, granulated slag from steel production, fly ash or synthetic gypsum (REA gypsum) from coal-fired power stations and used casting sand. Similarly to alternative fuels, these residual materials can no longer be used in their original material cycles. Their use in the manufacture of cement and clinker transforms them into a product that gives them a "new life" in a new material cycle.



Picture: Sand & gravel plant Schwarz | SCHWENK

WASTE MANAGEMENT

At SCHWENK, we act according to the principles of the circular economy and take care of production waste generated in our business units responsibly. We sort the materials generated during the manufacturing process and then deliver them to certified disposal companies. The majority of substances generated during the production process are recycled - they return to other production cycles as raw materials and are thus used for the manufacture of new products.

directly fall out of the concrete matrix. We are working to develop options for use of this material in clinker production and also in cement grinding (RCF=recycled concrete fines or crushed stone fines). In our ready mix plants, we are working on the technical options for adding or even completely replacing natural additives with recycled additives on request. Concrete and reinforced concrete are ideally suited for recycling into building materials at the end of their useful life. We are continuously experimenting with what is materially and technically possible and applying this in operating practice.

■ See also: Climate protection p. 24

RECYCLING ECONOMY IN BUILDING MATERIALS

There is a significant shortage of natural raw materials in the face of the increasing demand for raw materials. A recycling economy dedicated to efficient use of resources is becoming more important for securing supplies of raw materials. The building industry in particular is forced to think and act in material cycles with the requirements for greater energy and resource efficiency. The residues of building materials left after an initial stage of use should be recycled as completely as possible. The lifecycle of a building should be considered at the planning, design, erection and usage stages. The composition of the building materials must therefore be considered for recycling during the manufacturing process. We at SCHWENK make sure that we not only comply with material limit values at the usage stage but we also guarantee recycling as completely as possible at the end of the lifecycle. Even now the greater part of old concrete manufactured with cement is recycled for road and footpath building or for manufacturing recycled additives. Recycling and the most comprehensive possible reuse of mineral building wastes or building residues, including in the cement manufacturing process, is in our view becoming ever more important. When recycling old concrete, very fine particles that cannot be used

WATER MANAGEMENT

Water is a limited and therefore essential resource, particularly in this time of climate change. We are dependent on water for combining with cement, sand and gravel to manufacture concrete. Water is also used in many other ways during the production process.

In cement manufacture

All SCHWENK cement plants have access to large quarries from which we obtain our raw materials: limestone, marl, clay and sand. We place great emphasis on protection of the ground water. We regularly measure and analyse the development of the water table during the excavation process. In some cases, our cement plants are located in water conservation areas. In these plants, all stored raw materials, auxiliary materials and operating materials must be stored so as to eliminate any potential for water pollution, even in the event of an accident. In quarries where water storage is required to prevent flooding, pumping is required to remove water from some areas. We use this water to supply our cement works wherever possible. We are increasingly using the option of decentralised seepage areas to return water from precipitation to the water table immediately. We not only use water in the production process, we also simultaneously release large volumes of water. This occurs while drying raw materials and fuels and also during calcination in the rotary kiln. In addition to the release of CO₂, every combustion process releases a comparable volume of water (H₂O). When you drive past a cement plant in cool weather, you can see the condensed water vapour rising from the chimney. Depending on the location, 20-25 tons of water can be released from our chimneys every hour.

Water management cement 2021	Germany	Northern Europe	Lithuania
Drinking water consumed	139 million l	0.75 million l	16.3 million l
Average specific water consumption per ton cement	193 l/t	40 l/t	1240 l/t

During excavation of sand & gravel

Water management is just as important when excavating sand and gravel as in the operation of quarries for cement plants. We operate sandpits in the dry layers above the water table and also gravel pits below the water table. Special excavators dig the gravel directly out of the water. We take great care in the process to ensure that the machines and technology cannot pollute the water. After the excavation natural lakes are left – as well as lakes that can be used for swimming. The water available on site is used for washing gravel and is returned to the water table after use.

During manufacture of concrete

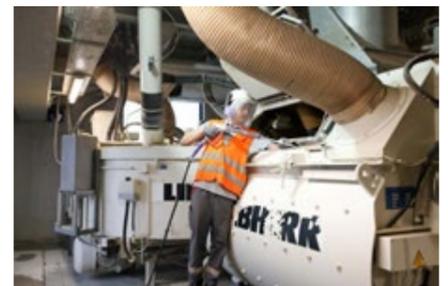
Concrete consists primarily of sand and gravel, cement and water. A cubic metre of ready-mix concrete requires approximately 180 litres of water for manufacture. More water is required for cleaning mixers or silo trucks after delivery of ready-mix concrete. This results in mud from washing and residual water which should be returned to the concrete manufacturing cycle as far as possible. All of our ready-mix plants are fitted with water recycling systems.



Water vapour at the Allmendingen plant | SCHWENK



Dredger at the Borgsdorf plant | SCHWENK



Cleaning the mixer in the ready-mix plant | SCHWENK

RECYCLED BUILDING MATERIALS

As well as possessing excellent technical properties, concrete and mortar are building materials which in principle can be almost completely recycled. In principle, all constituents of concrete can be considered a component of a recycling economy and can be re-used completely in the manufacture of concrete and cement, depending on the available options and the technical effort required.

We have participated in various projects to demonstrate the available options for the use of recycled aggregate in concrete manufacture. If customers request it we therefore supply ready-mix concrete with recycled additives – interesting examples of successfully implemented construction projects can be seen. The properties of recyclable additive are in some cases different from those of natural raw materials. This must be considered and taken into account accordingly to prevent new problems arising from an apparently reasonable solution to the original problem.



Processed recycled aggregates at Fees | Heinrich Feeß GmbH & Co. KG

RECYCLED CONCRETE IN USE

Regulations allow the use of recycled concrete in a defined area of the concrete structure for internal and external building parts up to strength class C30/37. The special characteristics of the recycled aggregate must be taken into account in the manufacture of the concrete in the ready mix plant. Processing at the construction site with installation and post-installation treatment is no different from standard concrete.

This means that recycled concrete can also be used to construct permanent and visually striking structures.

FROM RED TO GREY

Even though the recycled aggregate is very different in colour from standard aggregates, the completed structure shows no indication of which aggregate was used.



Picture: Recycled concrete aggregate 2/16 type 2 | Heinrich Feeß GmbH & Co. KG



Picture: Concrete exterior facade | SCHWENK

PRODUCTS AND SOLUTIONS



Picture: Bridge in Dresden | SCHWENK

CUSTOMER ORIENTATION

ENVIRONMENTAL RELEVANCE OF OUR PRODUCTS

We are surrounded every day by a wide range of products and structures that were erected with concrete and cement. We often take little notice of this building material. It has become an integral part of our environment. Its continuing success is becoming part of a global challenge: climate change. The more building material is manufactured, the greater the volume of CO₂ emissions. The CO₂ naturally contained in the limestone is released in the manufacture of cement. It makes up around two thirds of the CO₂ emissions of the entire manufacturing process. High demand results cumulatively in a significant “CO₂ footprint” and thus is highly relevant to the environment. From a global point of view, it is the sheer mass of cement and concrete used every year that represents a significant factor for the climate. And demand is increasing! The reason for the growth is the population increase, urbanisation and the desire for modern infrastructure with roads, bridges and residential buildings.

We are meeting the challenge at SCHWENK!

Increased efficiency and longevity of our building materials

To improve the CO₂ balance and increase the efficiency of resource usage, we need to do “more with less”. We have already improved the performance of our building materials and are doing our best to develop them further to face the challenges of the future. Cement and concrete are ideally suited for the construction of lasting and highly robust structures. The challenge is to close the associated material cycles as much as possible.

Together as an industry

With our building materials, we meet a highly specific demand. The market requires properties of our products that we have optimised and adjusted with our customers over many decades. CO₂ balance and optimum efficiency in the use of resources means that we now also need to take into account that environmental factors are as important as economic factors. The required changes, in some cases huge changes, will demand close cooperation from all involved. This will be the only way to reduce the climate relevance of our building materials in the long term.

At SCHWENK we are convinced that environmental factors are becoming increasingly important to the extent that we are expecting a future paradigm change in the entire cement and concrete industry. This is why we are continuously researching, developing and investing in keeping our manufacturing processes, products and services as sustainable as possible. Our target is to show Europe the technical options required so we can continue to build sustainably with concrete and cement. Our ambition challenges us to keep re-inventing ourselves while at the same time not losing our competitiveness and efficiency.

CSC certification

In Germany, SCHWENK has been certified according to the CSC System Standard 2.0 (CSC= Concrete Sustainability Council) in gold for all its cement plant locations since March 2020. This globally established certification system provides high-quality proof of the sustainable extraction of raw materials and the production of building materials. In addition, we are striving for further certifications for all our business units and cement sites in Northern Europe and Lithuania.

The system assesses and evaluates environmental, social and economical operational aspects for companies in the field of cement, concrete and aggregates. The certification process has confirmed that our building materials meet the highest standards for national and international systems for the assessment of the sustainability of buildings and structures (DNGD, LEED, BREEAM). In Germany, 25% of all buildings are already certified in accordance with such systems and the number is continuously increasing. The reason is that certified buildings have higher value and are more attractive to investors. In addition to the cement division, the first companies in our concrete division have successfully completed their certification.



Picture: SCHWENK CSC certificate | SCHWENK

PRODUCTS AND CONSULTING

We support our customers in the optimal use of our products through our cement application technology department (Anwendungstechnik Zement; ATZ), also referred to simply as “construction consulting”. In addition to cement, concrete or aggregates, we also offer services and digital consulting in the fields of quality control, logistics and consultation. The SCHWENK technology centre (Technologiezentrum; TZ) inspects and advises plant laboratories for SCHWENK companies and also for external customers. The changes pending in the area of the reduction in CO₂ intensity of our processes must remain in harmony with the advanced technical requirements of our customers for our products and services. This requires competent consulting and coordination. We provide this with ATZ, the concrete technology centre and our plant laboratories.

The increasing desire for sustainable construction can only be fulfilled by concurrent operation via many interfaces. From planners to architects to building material manufacturers, from companies commissioning buildings to government regulators – all entities involved are required to complete a building project successfully in both technical and sustainable terms. Increasing complexity is the major challenge here. Good communications and coordination, above all at an early stage, are essential to avoid an increasing number of faults, damage or planners, owners and building contractors becoming overwhelmed. By 2019 the properties of new building materials must harmonise with the practical work on the construction site. New properties of construction materials derived from the application of new technology must be securely controlled. We are committed to this through all interfaces. Our target is a solution combining the best aspects of environmental, economic and technological factors.

ACHIEVING THE TARGET TOGETHER

Individual entities in construction often work together like a well-rehearsed orchestra. A new piece of music or a new challenge must be communicated properly and rehearsed in order to achieve success for all.



Picture: Werner Rothenbacher
Application technology | SCHWENK

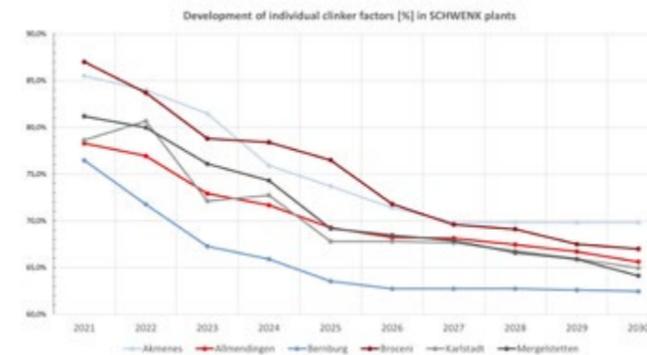
SUSTAINABILITY OF OUR PRODUCTS

Cement

Our cement is used for the production of various concrete structures, bridges, slabs, reinforced concrete and concrete paving blocks, ready mixes and the construction of heavy-duty objects, such as bridges and building foundations. We produce a variety of cements and are working to increase the number of lower clinker factor cements to support climate goals. Raw materials, production processes and products are subject to thorough testing and controls.

In cement production in Latvia for example, we currently conduct around 40 different tests on a regular basis - for processes, fuels, and cement. For this purpose, SCHWENK Latvia began major renovation and expansion of the laboratory at the Broceni cement plant in 2020, which was officially commissioned in January 2021. For several varieties of our cement, we conducted an assessment of the cement production cycle and obtained an EPD certificate. The latter analyses the ecological footprint of the cement manufacturing process - starting with the extraction of aggregates and ending with the final product. SCHWENK Latvia has an EPD certificate for the following cement types:
CEM II A-M (S-LL) 52,5 N
CEM I 52,5 N
CEM I 42,5 R
CEM I 42,5 SR-3

At our cement plants in Germany, we are currently developing new high-performance cements with a reduced clinker content of around 60 wt.%. These include the CEM II/C-M (S-LL) 42.5 N cements at the Bernburg, Karlstadt and Mergelstetten plants. CEM II/C-M (V-LL) 42.5 N cement is prepared at the Allmendingen site. The development and introduction of these cements, mainly for the ready-mix concrete sector, is an important milestone and will make a major contribution to reducing clinker factor in the coming years.



Concrete

We offer our customers technical and consulting support for more efficient use of concrete towards sustainable construction. Various tests on raw materials and products are carried out in our concrete laboratories on a regular basis or upon request. Concrete quality experts are also in close contact with cement, concrete and construction industry bodies involved in the development of industry standards and sustainable construction practices.

Aggregates

We produce certified aggregates for road construction, agriculture and the building industry. Production takes place in our quarry operations in compliance with the recognised rules of environmentally safe aggregate extraction, implementing the principles of responsible reclamation and preservation of the diversity of flora and fauna. The aggregates are manufactured and monitored in accordance with the applicable standards and regulations.

ADDED VALUE OF OUR BUILDING MATERIALS

Successful projects are characterised by the fact that on completion all parties involved are satisfied and that personal benefits, added value as well as common goals have been achieved. An increasingly important common goal is sustainable building. Our aim therefore is to supply building materials that meet the growing demands for climate protection, environmental protection, sustainability and resource efficiency. At the same time, we need to achieve added technical value – whether it is by highly consistent product qualities, simple and robust handling on the construction site or physical properties that go beyond the fulfilment of minimum standards.

As a family business, we are convinced that the investment and effort that we give to increased climate and environmental protection will bring significant added value to the company and its employees and their families, our customers and, viewed in the long term, also to society as a whole. Concrete and cement as building materials have outstanding potential for the future with their wide range of applications and excellent properties.

With good technical management, concrete building components and concrete structures can be used for a very long time, even under the most extreme conditions. This is a very positive factor when assessing the complete lifecycle of building structures. Concrete is not a disposable product! Superior and innovative planning combined with high-quality building and maintenance ensure that concrete is a building material for all who value long-term added value above short-term success.

ADDING VALUE

BUILT FOR GENERATIONS

Building with concrete means thinking long-term. The earliest uses of this material have demonstrated this. Buildings such as the Pantheon in Rome or the aqueducts have already lasted for millennia.

Picture: Reference In-Tower | SCHWENK

RESEARCH AND DEVELOPMENT

OPTIMISATION ACROSS ALL BUSINESS DIVISIONS

As a building materials group with a total of four divisions – Cement, Sand & Gravel, Concrete and Pumps – SCHWENK has a wide range of experience and expertise in the complete construction supply chain.

We cover virtually all requirements for our building materials by our own activities in practice – from our knowledge of geology and the environmentally compatible operation of our quarries, sand and gravel pits for concrete additives to the manufacture and quality control of cement, the main binding agent, through to optimisation and monitoring of high-performance concrete mixes. SCHWENK is the market leader in many parts of Germany when it comes to the most demanding applications such as pumping concrete over long distances under very high pressure.

The development of new cements with even less clinker content and new properties has immediate effects on the subsequent options for application in concrete. For example, the increased use of recycled aggregates changes the requirements for classical aggregate materials such as sand and gravel or for the construction chemistry used in concrete. Even the processing procedures for manufacturing recycled building materials may change some important durability properties.

As a building materials group, our strength lies in understanding the complex interactions involved with all divisions working together. We collaborate with universities, research centres, our industry associations and, of course, our customers to maintain a holistic view on sustainable building.

ONE DIVISION FOR ALL AND ALL FOR ONE:

Because the overall solution does not lie in individual solutions along the supply chain. At SCHWENK all divisions work closely together to improve the sustainability of building.



Picture: Concrete laboratory | SCHWENK

“Developments in the building materials field are a marathon - not a sprint!”

Our starting points

Product



Application



Process



DEVELOPING CEMENT AND CONCRETE WITH IMPROVED CO₂ BALANCE

One of our strengths is proximity to our customers and markets. Ensuring the consistency of our building materials, high reliability and supply security and consistent compliance with guaranteed properties is and remains the highest goal of our building material development. Climate change brings another factor into the focus of our research and development. The challenge associated with this requires us not only to improve our existing products and processes but also to deal with completely new technology in some cases, which can be referred to as “breakthrough technology”. This will require a high degree of effort in development and financing.

We will have to develop multiple selected and potentially promising technical approaches in parallel to comply with legal requirements and to meet the general interest in climate-neutral building materials. And of course we cannot neglect the day-to-day cooperation with our customers and continuous product development.

We are currently working on projects such as Celitement, additive manufacturing (3D-printing) and the oxyfuel process.

Product technology: Celitement – a completely new type of hydraulic binding agent

With Celitement, SCHWENK has a completely new and globally patented binder system with excellent technical and good ecological qualities. Based on the results of basic research at the Karlsruhe Institute of Technology (KIT), we have developed the product and production process to industrial maturity over the past few years. At the beginning of 2020, SCHWENK took over Celitement GmbH in its entirety, including the pilot plant. The planning for a first industrial reference plant is almost complete. Depending on the final evaluations of numerous trials with sample material from the pilot plant, SCHWENK will decide on the investment in a first industrial plant. Celitement is one of the very few developments in the field of innovative binding agents that has managed the transition from research to industrial practice. Projects of this type need the long-term approach of a family business like SCHWENK for successful implementation.

Application technology: Additive manufacturing (3D printing) with short carbon fibres

Using a special extrusion process, we are working with a partner in the building industry to develop a process for manufacturing innovative finished parts without using reinforcing steel by additive manufacturing. We see the industrial prefabrication of concrete components as a possible way of introducing innovative building practices that also save resources to the industry. We are interested in bringing increases in productivity that have long been implemented in other industries to the manufacture of concrete. This will require the development of not only machinery and processing technology but also the right binder. A particular challenge in the field of additive concrete building is the achievement of product characteristics that are normally achieved by the use of reinforcing steel. In contrast to many other “3D concrete printing” concepts, our initial focus was on the development of building materials with oriented short fibres derived from specially treated carbon fibres. When correctly combined and applied, these materials can achieve not only the well-known high compressive strength of cement mortar but also extremely high flexural strength. We are pursuing and promoting the development of innovative 3D printing processes in concrete construction so we can align our products to the new requirements of these technologies at an early stage. Technology such as this requires close cooperation and collaboration with materials scientists, mechanical engineers and toolmakers, computer and IT specialists as well as planners and structural engineers.

Processing technology in cement manufacture: The oxyfuel process

The manufacture of building materials such as cement of consistent quality demands a high degree of familiarity and experience with the industrial processing technology for cement manufacture. The process of developing a cement plant as free from CO₂ as possible is a very ambitious project. The target is to trap the CO₂, which cannot be eliminated in the process, using carbon capture technology. Once liquefied it can be stored underground (CCS = Carbon Capture & Storage) or combined with hydrogen in a wide range of processes to form other products such as synthetic fuels (CCU = Carbon Capture & Use).

Two basic approaches to separating CO₂ in cement plants are available:

1. The CO₂ can be separated from the typical exhaust gas flow from the chimney. The disadvantage of what is referred to as post-combustion technology is the very high volume of exhaust gas. Air consists of 78% nitrogen (N₂). The carbon capture process requires nitrogen and CO₂ to be separated. This requires a high investment in plant technology and high power and heat requirements during operation.
2. An alternative is oxyfuel technology. This process uses pure oxygen for combustion in clinker manufacture, which significantly reduces the volume of gas that must be cleaned. SCHWENK, along with three partners in the cement industry, has decided to set up an initial research and development plant using this technology at Mergelstetten. The company set up for this purpose, Cement Innovation For Climate (CI4C), will manage the project over subsequent years.

PIONEER PLANT AT MERGELSTETTEN

Our Mergelstetten cement plant will be the site of the first research and development oxyfuel plant



Picture: Cement plant Mergelstetten | SCHWENK

NEW BINDING AGENTS; PRODUCTS AND TECHNOLOGY

Step by step to CO₂ reduction

An interview with Dr Hendrik Möller, Member of the Executive Board and Managing Director of Celitement GmbH, Bastian Elterlein, Member of the Executive Board and responsible for Sales and Logistics and Dr Georg Locher, Technology / Project.



Picture: Dr Hendrik Möller | SCHWENK

Dear Dr Möller, You are Managing Director of Celitement GmbH & Co. KG and we interviewed you on the binding agent developed there for the last sustainability information in Autumn 2020. What has happened since then?

We've invested heavily and increased the production capacity of the pilot plant to about 5 tonnes per week since the beginning of 2022. That's a tiny amount compared with one of our cement works, which makes a cement mill in a few minutes. That's a ten-fold increased compared to earlier though, when we were only able to product approx. 500 kilograms per week. It allows our innovators, the partners with whom we test the practical application of this new binding agent, to conduct industrial application trials too.

Since my last interview, we have successfully conducted numerous large-scale practical trials with several tonnes of Celitement in a wide variety of applications. So recently we've produced the world's first industrial aerated concrete and were able to replace all of the cement portion by Celitement. We're now beginning experiments in the context of the tests for building approval of Celitement by the

DIBt (German Institute for Construction Technology) in Berlin. This is the first approval procedure in Germany for a new binding agent that can be used to replace Portland cement in all applications. A lot has happened as a result, especially in the area of market preparation.

How much better is the CO₂ balance of Celitement compared to Portland cement?

That is difficult to answer. Let's start with the basis of the comparison. What sort of cement are you thinking of? The European cement standard includes 27 types of cement, soon to be 30. Even if no reliable figures based on measurements at an industrial Celitement plant are available as yet, in our opinion pure Celitement is now at least 30 percent better than an average European ground clinker. Higher savings of up to about 50 percent are also possible, depending on the recipe for the starting raw materials and how far we can optimise the process.

However, ultimately the volume of CO₂ per tonne that a single binding agent emits is not really relevant. What is relevant is the CO₂ burden of the structures or building products manufactured with it. This is where efficiency and technological performance become a factor, where the "green" cements or special binding agents such as Celitement can still have some advantages.

So what happens to the pilot plant in Karlsruhe when Celitement is produced on an industrial scale?

This plant will, of course, continue to operate because we've developed a unique technical centre worldwide here for the SCHWENK Building Materials Group, which offers valuable opportunities for many other developmental fields in the cement sector besides the production and further development of Celitement.

Our various milling plants provide us with the means to dry and mill a wide range of different cement milling additives there for example. For the development of new composite elements such as CEM II/C-M which have to contain up to three other milling additives besides clinker, it is very important to be able to conduct concrete trials at an early stage. To do so, you need up to one tonne of material fast. To date, we haven't been able to put this into practice this so easily at SCHWENK.

The mills in the plants are too big for this and the laboratory mills in the cement laboratories are somewhat too small. So the size of the plant in Karlsruhe is just right. We have already milled many interesting materials there for the future ranging from various kinds of slag through material for recycled concrete to natural pozzolans. Our autoclaves can also be used for experiments in numerous other building material groups. Autoclaving is used in aerated concrete, sand-lime brick or fibre cement for example.

Moreover, the plant is also used for design and dimensioning tests for plant engineering. Depending on the raw material base, the process and guarantees for industrial plant can be optimised. I used to work in cement plant construction. You have pilot plants there too, so you can run design tests for new cement plants. We don't want to build just one Celitement industrial plant.

Which brings us to the last question. When do you think the first industrial reference plant will go into operation?

That's the question I'm asked most frequently at present. We've made an application for building authority approval at this stage so that Celitement customers from an industrial plant can use it to construct structural components in the near future. If everything goes well, we'll be holding the DIBt approval in our hands in just over two years.

Many thanks for the update Dr Möller.

It has been a pleasure.

Besides Celitement, SCHWENK is also working on new CO₂-reduced cements. What exactly do you mean by that Mr Elterlein?

We achieve CO₂ reduction with these cements by using an efficient mixture of clinker and various milling additives as the main constituents. These could be ground limestone, fly ash, granulated slag or pozzolans.

At SCHWENK, we talk in terms of CO₂-reduced cement types with a clinker content (reinforced) of less than 70 % and hence with a milling additive content of more than 30%.

Incidentally, we have marked these cements clearly in our price lists. With the types available as bag goods, we have also supplied each bag with our focus point for sustainability to increase awareness directly with the user.

How many CO₂-reduced products does SCHWENK already have in the programme and where are you heading?

15 out of 36 cement types available in our price list for 2023 meet the criterion described above. Four different CO₂-reduced cement types are available to our clients as bag goods.

For future years, we are working on further clinker-efficient cement types which we subject to extensive cement and concrete technology as well as practical testing before we apply for plant-specific approval.



Picture: Bastian Elterlein | SCHWENK

What are the challenges involved in CO₂-reduced cements?

I'd like to mention an internal and a client-side aspect here. Firstly, the availability, logistics and storage of these additional massive material flows are a challenge, which is connected with high materials costs and investments in the plant.

For the client's part, using the correct type of cement for the exposure class in question makes the whole matter more complex. So interior components with significantly CO₂-reduced cements are easily produced although other cements may have to be used for directly adjacent external components. This means that convenient "one-size-fits-all cements" have to be replaced by 2 cements in some instances and increased attention is required on the building sites when installing the concrete. We are happy to address these challenges with our clients for the potential CO₂-reductions that are made possible.

That sounds like an exciting future. Thank you, Mr Elterlein.

Thank you too.

IN FOCUS: CO₂ REDUCTION

CO₂ can not only be saved using new binding materials or new products, however. Technical measures offer solutions as well. Dr Locher, what technical options are there on the market at present?

Amine washing is the only market mature option at present which is established in the chemical industry and is already used in other industries such as waste incineration for example. In addition, there is a high number of other processes which are being studied and further developed in the technical and scientific sphere and in industry. The development effort which is required from the original concept to the industrial plant is frequently supported in terms of both time and finance. We're talking here about development costs over ten years and costs that far exceed 100 million Euros until a technology has been developed which means that approx. 2,000 t CO₂ daily can be removed in the average German cement plants. This is why many technologies are still in their infancy and will probably not reach the point of technical readiness for large-scale use in this decade.

I also assume that not just one individual technology will be used in the future. Rather the choice of the best solution depends on the conditions that prevail on site, particularly the availability of thermal and electrical energy. Currently, about ten processes are increasingly the subject of expert discussion including the oxyfuel technologies which we find particularly interesting. But obviously we are also following developments in other technologies very closely.

And what path has SCHWENK chosen?

With our partners in Konsortium CI4C (Cement Innovation for Climate), we are currently constructing, on the premises of the SCHWENK cement plant in Mergelstetten, our own research and development facility on a semi-industrial cycle for almost complete CO₂ removal from the exhaust gas from cement factories. The pure-oxyfuel process (from oxy for oxygen and fuel) used in Mergelstetten is a clinker combustion process in which, instead of air, pure oxygen is put into the oven to guarantee heat generation excluding atmospheric nitrogen by burning primary and alternative fuels. In this way, the CO₂ portion in the waste gas is increased to approx. 90 percent and hence the potential for CO₂ removal is greatly increased. The aim is to remove 100 percent of CO₂ emissions cost effectively.

In addition, we have been able to save a high amount of CO₂ in recent years by massive investment in our plants. Through improved technical plants, we are able to replace fossil fuels in production almost completely by alternative fuels.



Picture: Dr Georg Locher | SCHWENK

What do you see as the biggest challenge for technical solutions?

Society and industry, above all in Europe and other industrialised countries, are currently striving to achieve an optimally climate-friendly world by 2050 (or even by 2045). That leaves us at least 20 years to make the necessary changes.

From the technical perspective, the construction of CO₂ infrastructure is of decisive importance. This infrastructure must be available when, at the end of this decade, large amounts of CO₂ must be removed and transported not just from the cement industry. A further challenge consists of providing large quantities of renewable electrical energy and of green hydrogen as well, to transform the CO₂ removed into chemical products, e.g. into aviation fuel. However, I see these technical challenges as less serious than the political and social challenges. Many agreements and undertakings have been made on the highest political level (national and international) but the local and regional actors have been only partly involved in the decision – so industry is faced with question marks in relation to implementing the measures. It is to be feared that, although we can remove CO₂ at our plants, it will prove impossible to convert it into chemical products or to transport it. But I can see the positive in this – we make a constructive contribution and solve our problems.

Very nice closing words. Thank you very much, Dr Locher.

It has been a pleasure.



A STRONG NETWORK

FOR RESEARCH AND DEVELOPMENT

COOPERATION WITH PARTNERS AND UNIVERSITIES

We have maintained and expanded a network with a wide range of partners for many years. We use the network to find out about and continue the development of the latest methods and processes – particularly in the field of CO₂-reduction. Because the construction industry is dominated by small and medium enterprises, the average expenditure on research and development is not comparable with other industries such as the automotive industry. This makes it even more important for us to work closely with reliable partners.

In **1879**

we started working with the Test Institute for Building Materials directed by Dr Wilhelm Michaëlis.

In **1894**

we started working with the Royal Technical University in Stuttgart (today the Otto Graf Institute).

COOPERATION PARTNERS IN THE R&D NETWORK

R&D

MIP Polymerforschung Mainz	MPA Berlin Brandenburg	University of Stuttgart and MPA Stuttgart
EMPA Zürich	University of Augsburg	University of Weimar
KIT Karlsruhe	TU Clausthal	TU Munich
Bergakademie Freiberg	MFPA Leipzig	TU Aachen
BASF Construction Chemicals	FH Nuremberg	University of Erlangen
		Fraunhofer Inst. for Silicate Technology
		HBC Hochschule Biberach
		Riga University of Technology
		University of Ulm



SIX DECENTRALISED SCHWENK LABORATORIES

Our laboratories at the cement plants are competent contacts for our network.

Picture: Cement laboratory | SCHWENK

PEOPLE AND ENVIRONMENT



Picture: SCHWENK employees | SCHWENK

EMPLOYEES AND EMPLOYMENT

PEOPLE AT THE CENTRE

Highly qualified and motivated employees are a decisive guarantee for the success of our company. Through attractive working conditions and targeted development measures, we create framework conditions that allow our employees to be successful. This is how we lay the foundation for sustainable corporate development. For us as a manufacturing company, occupational safety and employee health have the highest priority.

We are proud to be a traditional family business. It is important to us that our employees have a modern and safe working environment. As a company, SCHWENK takes responsibility for the protection of its employees, their health and for sustainable business. For us, a good human resources policy means creating framework conditions for our employees within which they can develop their strengths and achieve the best results. Appropriate remuneration and attractive social benefits contribute to this, as do targeted, individual development measures and an atmosphere of fairness and appreciation.

Our leadership principles describe fundamental and binding principles with regard to employee management. They provide our managers with valuable guidelines for everyday management - for example, with regard to responsible action, employee development and transparent communication at eye level.

EMPLOYMENT AND EMPLOYEE PARTICIPATION

Workplace co-determination has been firmly established and proved its worth in several of our companies over many decades. Management, human resources management (HRM) and employee representatives are in constant constructive dialogue with each other. Dialogue with the trade union is just as open and fair in the given contexts. As a family business, we have always been strongly committed to social issues out of conviction.

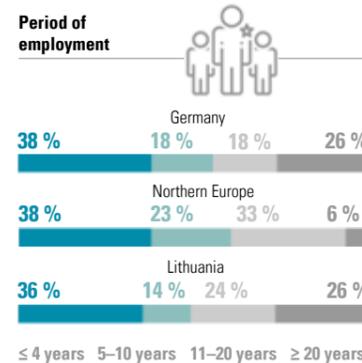
Number of employees

At the SCHWENK Building Materials Group, we employ around 3,160 people. These are divided among our four business units cement, sand and gravel, concrete and concrete pumps in Germany, Northern Europe and Lithuania.

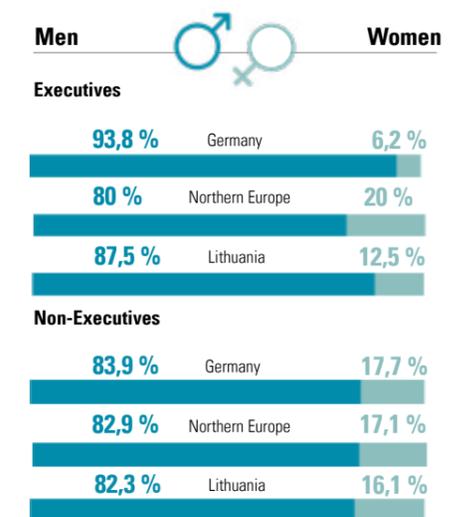
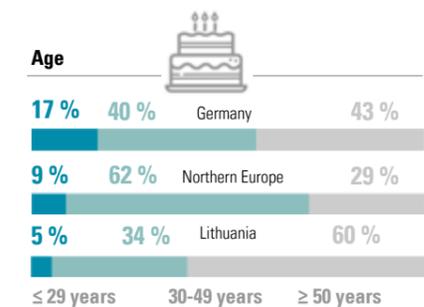
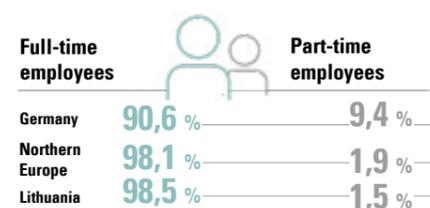
3,160 employees

Period of employment

We are especially proud of their many years of loyalty to the company. Around 45% of our employees have been with us for more than 10 years, making them an essential part of the SCHWENK family.



Employee distribution





Picture: Nico Häber trainee | SCHWENK

SECURE AND FLEXIBLE

FLEXIBLE WORKING HOURS

In the interest of flexible working hours, we offer our employees models such as trust-based working hours, flexitime, working time accounts, part-time and leaves of absence and hybrid work. For older employees, we offer individual partial retirement arrangements on a case-by-case basis. The part-time rate among our employees is up to five per cent on average.

REMUNERATION POLICY AND WORKING TIME REGULATION

Our remuneration policy is based on the market standards for companies in the industry. In almost all companies we are bound by collective bargaining agreements and reward our employees' commitment with competitive wages and salaries. The size of the German company pension scheme corresponds to the usual market standards.

With regard to working time regulations, we strictly adhere to the legal requirements. Our compliance guidelines, according to which those affected can report possible violations individually, support compliance with all regulations made.

PERSONNEL DEVELOPMENT

Goal-oriented and tailor-made personnel development measures make a significant contribution to our company's success. They specifically promote our employees' competencies and ability to act. Personnel development is therefore one of our managers' central tasks. At SCHWENK, it essentially consists of the following three components.

Tasks and responsibilities

By being assigned tasks and responsibilities, e. g. ad-hoc project assignments, employees are developed professionally and personally in their daily work environment. With a regular appraisal interview, to which every employee is entitled, we create the conditions required to identify specifically our high performers and high potentials and to promote and further develop them in a customised manner by means of individual development plans. This is linked to systematic succession planning for all management and key positions. This is a central and personnel-related risk management process and is carried out in close coordination between managers and the HRM department in each region.

Coaching

Coaching is another building block. Within the framework of continuous feedback, exchange and discussions, our managers support each individual employee in his or her development.

Training

Internal and external training, advanced training and further education provide additional support for employees as needed. The internal promotion of junior staff is an integral part of our personnel development measures. In Germany and Latvia there is a development program that supports young high potentials in their further career planning.



Picture: Employees and trainee coordinators | SCHWENK



Hannes Rattunde, Industrial mechanic | SCHWENK



Alina Urbanski, Building materials inspector | SCHWENK



Toni Angermann, Electronics technician | SCHWENK



Nina Krenzer, Bachelor of Science Wirtschaftsinformatik | SCHWENK

TRAINING AND CONTINUING EDUCATION

Training

In addition to the activities described, training has always been a very high priority at SCHWENK to secure the next generation of qualified employees. In 2021, we offered a total of 12 different commercial and industrial-technical apprenticeship occupations as well as two dual courses of study. Overall, we achieved a vocational training quota of 5.2% in 2021. There are differences here depending on the region and business segment, as dual vocational training is a firmly established model in Germany. We are particularly proud of the fact that, in the same year, 91% of our trainees started their careers at SCHWENK after passing their exams and performing well. We offer our trainers and training officers internal and external qualification measures to further professionalise their work with young people.

In addition to the actual training, we also regularly offer pupils and students the opportunity to gain practical experience in the context of internships, final theses and student traineeships to gain practical experience of working life and to get to know SCHWENK as a potential employer. In Latvia we have a scholarship program to promote STEM studies in vocational schools and universities. This is particularly well promoted among students in the region where we operate our cement plant.

5.2 %
trainee quota

12
different commercial and
technical occupations

91 %
employment of trainees

Continuing education

When it comes to further education, it is important to us to offer employees needs-oriented and customised development opportunities. In terms of methods, we pay attention to the appropriate mix of on-the-job and off-the-job measures. In Latvia, for example, "Step into my shoes", an internal experience-sharing programme, is organised every year. Employees visit different departments, which deepens knowledge transfer and promotes internal networking. Furthermore, we specifically promote extra-occupational qualification measures such as more extensive, long-term training and additional qualifications. This is to ensure that the professional development interests of our employees in the company are linked to the company's aim and strategic goals.

In 2021, our central focus was once more the topic of occupational health and safety in our training activities. In all development measures, we ensure that what has been learned is reflected in and transferred to the learners' operational practice. Appropriately designed tools and processes systematically promote this transfer and increase the sustainable effectiveness of the measures. Responsibility for this is always shared between the learner and his or her manager, who we see as the first personnel developers of their employees and who we hold accountable accordingly.

DIGITAL LEARNING

In the field of occupational safety, we have already gained very good experience with online instruction. We have extended this to the IT sector and offer online training on various software solutions. In the future, the range of digital learning formats and content is to be extended to other specialist and subject areas. The modernisation of the IT infrastructure and the introduction of cloud-based collaboration tools also promote new, virtual forms of cooperation.

MANAGEMENT DEVELOPMENT

We offer our executives specific management training. In addition, we encourage reflection on one's own leadership role as well as the mutual exchange of experiences in the form of individual coaching and collegial case consultation. These offers enable leaders to develop solutions and ideas for everyday leadership. Despite the tense Corona situation, we were able to implement several offers in person, which were accepted by many leaders. In the future, we would like to strategically anchor leadership development even more firmly. In addition to continuing to offer annual focus topics, for example, a structured introduction for new executives at SCHWENK should be the focus.

WORKING
TOGETHER
TOWARDS
ONE GOAL

For the development of our employees
and our company



Picture: Tobias Schullar, TZ Central Laboratory North | SCHWENK

DIVERSITY

MAKES ALL THE DIFFERENCE

DIVERSITY MANAGEMENT

We expect all managers and employees of our company, without exception, to behave in a legally and ethically correct manner at all times. SCHWENK is committed to the core labour standards of the International Labour Organization (ILO) and the United Nations Universal Declaration of Human Rights. We expect our workforce and our business partners to consistently comply with these central guidelines and recommendations. In Northern Europe, we have established a Code of Ethics which is an integral part of our governance model and compliance with it is a mandatory requirement for our employees and collaboration partners. A separate whistleblowing channel has been created to report instances of misconduct.

Diversity as a success factor

We recruit and promote employees exclusively on the basis of their professional qualifications and experience in performing the job in question and do not allow personal characteristics or convictions to influence our decision. We firmly believe that people are particularly motivated to work when they and their work performance are valued free of prejudice. The diversity of our workforce contributes to the success of our company. The different backgrounds and ways of thinking and seeing release additional potential for creativity and innovation. In this way, they make a valuable contribution to the design of processes and the development of customer solutions. We think it is important that a common understanding of the company and a uniform system of values form the link between diversity and unity. Against this background, we are proud to employ people from a total of 25 different nations in our company.

Generation management

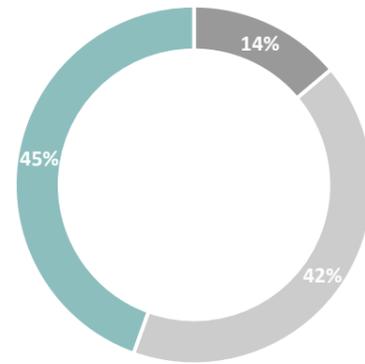
By means of forward-looking and systematically updated personnel planning, we ensure a balanced relationship between retirees leaving the company, the vocational training of junior staff and external recruitment so that staffing risks are avoided with foresight. We are particularly pleased to see how our employees support and encourage each other across generations on a daily basis. This happens, for example, through the sharing of professional and process knowledge built up over many years on the one hand and the efficient use of modern technologies and software/communication solutions on the other.

Compatibility of job and family

As a family business, we have always placed great importance on family values. Depending on their domestic situation, the needs of our employees can vary greatly: from building a house to planning a family and to taking care of relatives. We support our employees by being aware of the individual situation, assessing applicable actions and developing individual solutions. Examples of how we assist can be flexible working hours and arrangements for working from home.

45.4 years
is the average age of our employees

Our people fall into the following age groups:



■ 16-29 years ■ 30-49 years ■ >50 years

Communication

Targeted and dialogue-oriented communication is the core of our cooperation and promotes a focussed exchange of knowledge. With a wide range of online and offline communication platforms, we can align the exchange of information to specific target groups, bring transparency to corporate processes and make information available at all times.

SCHWENK has been using the social intranet SCHWENK One as its main communication channel since 2020. It is used for all kinds of announcements and also as a dialogue-oriented exchange platform and to share documents in real time. This is complemented by the digital collaboration platform Microsoft Teams, which offers an excellent solution for fast, cross-border formal and informal exchange. Furthermore, announcements are published at all our sites via digital or analogue infoboards, which ensure widespread access to information.

Despite the increasing importance of digital channels, we see regular personal communication as an essential part of internal communication. For this reason, our digital channels are completed by personal formats specific to target groups and topics. At our plants, for example, early meetings are the basis for daily collaboration. In addition, regular marketplace discussions at headquarters and annual company meetings provide the perfect platform for communication and enable open dialogue.



Picture: SCHWENK employees | SCHWENK

OCCUPATIONAL HEALTH AND SAFETY

Safe and healthy working conditions are an important foundation for the success of our company. This applies to our employees and to all persons who enter our facilities or who could be put at risk by our activities and products. Every accident means human suffering for the victims and their families. Therefore, the prevention of work-related injuries, health problems and diseases is top priority for us. In cases of doubt, occupational health and safety always takes priority. All employees are required to take active responsibility for occupational health and safety in their areas of work and to take an active part in improving health and safety at work. We promote the competence, risk awareness and responsibility of all employees by personal training courses and e-learning activities.

With the MISSION ZERO campaign, we are pursuing the goal in Germany and Northern Europe of accident-free working and also preventing near-accidents. Our common motto applies to all processes: "we work safely or not at all". The fact that we take this seriously must be authentically practised by all supervisors at all times.



Picture: Concrete pump with secure stand, BPD Vogtland | SCHWENK

Accident rate (LTIFR) * 2021	Cement	Sand & Gravel	Concrete	Pumps
Germany	4.2	45.2	31.3	74.9
Northern Europe	4.5	0.0	0.0	-
Lithuania	2.4	-	8.9	-

*Number of accidents among all our employees resulting in at least one day off work per 1,000,000 working hours.



Picture: Safety equipment
Karlstadt | SCHWENK



Picture: Safety equipment
Latvia | SCHWENK

SAFE AND HEALTHY

More than 90 percent of occupational health and safety management systems in our German plants are certified with "Sicher mit System" [Systematically safe] certification by the Social Accident Insurance Institution.

We have established management systems for health and safety at work. This provides a structured procedure for the planning and implementation of measures for the prevention of work-related accidents, occupational diseases and other work-related health hazards and for effective first aid. The provision of safe and healthy workplaces, the detection of risks and opportunities and the continuous improvement of our occupational and health performance are the priority.

The health and safety of third parties is also important to us. The rules for the protection of visitors to our facilities are described in binding guidelines. Our pump and ready-mix trucks have turning sensors and camera systems, specifically for the protection of pedestrians and cyclists on the road. We provide checklists to construction managers and our pump operators for setting up concrete pumps. They cover all

safety aspects for our machines and building sites. Trained safety coaches support our pump operators on site with site inspections and inspections of the vehicle equipment and the driver's protective equipment to ensure health and safety.

OUR MISSION ZERO

Health and safety is our core value and main priority. We strongly believe that zero accidents is the only result that is good enough, when it comes to incidents and accidents. This is the goal we set ourselves anew every day and attach great importance to keeping it alive.

Dmitrijs Danilenko, Health and Safety manager in SCHWENK Latvia, talks about Mission Zero initiatives in 2021.

What is Mission Zero?

It is our goal – zero harm, zero accidents and incidents at work. Everybody should feel safe at work and return home safe and sound. That is our strong belief, core value and principle. Mission Zero also stands for all activities and programs we have for reaching this goal and is based on 14 roadmap elements.

What are those elements?

Fourteen elements cover various areas of risks that we face every day and aspects of health and wellbeing we should think about to keep ourselves in good shape. By highlighting each of these areas separately we hope to make them more memorable and create associations. In developing the roadmap we followed previous experience, best practices and statistics on work-related incidents and accidents, as well as pursuing extensive discussions with field managers about the most important issues to focus on.

Indeed, when looking at all 14 elements, they seem very detailed.

As a heavy industry, ours is a high-risk industry involving matters worth detailed analysis. For example, fire safety is a separate element and includes a variety of aspects – both smoking in places where it is forbidden, threat of explosion, fire safety at materials storage, ability to react in emergencies etc. Besides, our goal is to ensure that our employees take this knowledge home with them and apply it in their private life. As I said, everything is based on our experience.

In 2021 SCHWENK Latvia launched the Mission Zero training programme. Tell us more about that.

All company employees participate in live training sessions going through all 14 roadmap elements. The training consists of 8 main topics and lasts a whole working day. During the day, we manage to analyse several case studies, investigate accidents, and practice convincing people to act safely, thus preventing a potential accident. In the future, we plan to adapt this program to the training of cooperation partners.

What is the most challenging aspect of achieving the Mission Zero goal?

The target which we set ourselves anew every day. Now that I can state that health and safety is deeply embedded in our DNA, all other actions and decisions are undertaken and implemented through this perspective. But we still need to work really hard to maintain awareness that health and safety starts with every one of us. That each day without injuries is just one step forward and this goal is set again and again with every new day. They say that biggest enemy of tomorrow's success is often yesterday's success, and this is where we can see the truth of this very clearly – even after long and happy periods of zero accidents we can't forget that we should keep our minds and eyes open.

What do you think helps?

The most important thing is that H&S becomes part of our individual values that we take home to our families. On a practical level, I'd say that our risk reporting tool is a big help – each employee is invited to report potential risks, any hazards that have been overlooked or just share their ideas on improvements. We receive more than 1700 risk cards annually. This helps a lot to improve the environment and empowers people to be engaged. Of course, a strong team is the biggest helper at those times when something's not working.

Do you have any other plans regarding Mission Zero?

Our goal is to take this initiative outside the confines of our company – establish a nationwide initiative uniting employers from various fields and working together towards life with zero harm.

Many Thanks Dmitrijs Danilenko

No problem, it was a pleasure.

Interview: November 2022



Picture: Mission Zero Campaign | SCHWENK



Picture: Dmitrijs Danilenko | SCHWENK



Picture: Mission Zero Training | SCHWENK



Our sticker is shaped like a shield. Equipped for everyday work, it reminds us daily of our common mission!



HEALTHY LIVING

Picture: Irene Walter and Christiop Schulze (Training Island Manager Ulm-Augsburg-Kempten) | SCHWENK

THE DUTY OF US ALL

The promotion of employee health always needs to strike a balance between working conditions, individual behaviour and personal responsibility.

HEALTH MANAGEMENT

Healthy and top-performing employees are a significant factor in the success of our company. Since 2013, we have combined our activities in the field of health into a company health management system.

The aim of our holistic approach is to implement and promote a comprehensive and preventive health policy. This includes areas such as improving awareness of health issues among employees and management, promoting well-being in the workplace and reducing health risks and stress. We offer a wide range of measures, activities and programmes designed to meet the needs of our employees. We conduct regular employee surveys of to ensure continuous improvement and adaptation of our services.



TIPS

Quick and easy – tips for everyday use on the intranet

We regularly post targeted exercises and information in the field of health on the intranet. Employees can take part in small learning units which give tips on how to improve their health and integrate these improvements into everyday life. The continuous enrichment of the content provides a wide range of information for all employees.



PREVENTION

The basis for early action

Medical prevention is an important part of maintaining health. We support participation in preventive medical examinations with local offers and as part of our bonus programme.



COMMUNICATION

From training to workshop

Training and workshops for our managers ensure that they can conduct communications processes, such as employee interviews, successfully. We maintain a communications culture that provides open and regular information on health topics to promote and reinforce awareness of health among employees.



COURSES

Preventive action for physical and mental health

Some of our sites have various exercise programmes for maintaining health and fitness. Employees can participate in an internal SCHWENK course during breaks or after work. The options range from fitness training to back exercises through to yoga. We also work with Jobrad, a company bike-leasing plan, designed to promote healthier and environmentally friendly movement.



BONUS PROGRAMME

Collect points

The bonus programme is an important part of prevention. Employees can collect points by healthy behaviour, even at home, and convert them into prizes.



RISK ASSESSMENT

Guide to our offers

The risk assessment of psychological stress is an important field of action for occupational health and safety and for health in particular. Specific offers in this area are derived from our regular surveys of employees.

UNITED AGAINST COVID

2021 was the second year of the pandemic. Although we all had adjusted to the new normal, epidemiological challenges remained very high and human fatigue made it even harder to maintain the focus on staying safe and healthy.

Linda Sedlere, SCHWENK Latvia Director Human Resources, Communication, Health and Safety tells us more about what was important for getting through these tough times.

What was the main challenge in 2021 in the context of managing the pandemic?

The tiredness and fatigue we all experienced from the pandemic. If 2020 came with very active crisis management, launching new processes and adjusting our work to the new normal, 2021 brought the familiar yet never-ending process of physical distancing, extra safety measures and loneliness. It was a challenge for everybody to maintain the newly established procedures with the same commitment as before.

What helped you to do that?

We tried our best to create the feeling of normality even in new circumstances. The basic requirement was to maintain epidemiologically safe working conditions, so that employees could focus on their duties without fear of getting infected. As early as the start of the pandemic we changed the way we planned shift work, launched distant working models and various safety measures in all our locations. We also emphasised individual activities for increasing safety - employees and their families had an opportunity to get a Covid vaccination in the workplace, we provided a day off after vaccination and a nurse was available at our main location for ongoing tests etc. Ongoing communication and commitment were very important for consistent actions. This ensured that there were ways to obtain information and an opportunity for every individual to engage with and support corporate activities.

Do you see any long-term benefits and lessons learnt from this time?

Yes, of course. Each crisis is like a super dose of innovation and new knowledge to make our future better. I'm glad to see how health awareness has risen among all employees and it's good that we have survived the pandemic with relatively low rates of disease among employees and no interruptions of work continuity. We also see that hybrid working models work very well for many groups of employees, for whom this is a possibility in both technical and practical terms. And there is no doubt that we wash our hands and ventilate our premises more regularly. Overall, there is no doubt that we have become more resilient. Next year the focus will increasingly be on our employees'

psychological well-being, as the result of social distancing and anxiety is a new normal working environment, which is much more unpredictable.

SET OF ACTIVITIES FOR STANDING UP TO COVID AT SCHWENK LATVIA –

- Dedicated newsletter on COVID-19 statistics, preventive measures, tips for staying safe
- Weekly rapid response team meetings for management teams
- Close monitoring of cases to recognise possible contact persons at work
- On-site quick testing for employees and subcontractors available 24/7
- On-going provision of specific PPE – face covering, sanitizing equipment, air filtration etc.
- Remodelling of daily operations and work-flow – separation of shifts, transition to on-line meetings, restriction of third-party visitors to all company locations
- A holistic approach to distant working, widening its scope and opportunities
- Launching limits for the number of people present at the office
- Launching a health kit for all employees with vitamins, tests, sanitisers and face masks
- Body temperature measurement devices in specific locations
- Postponing all large gatherings and replacing them with on-line initiatives for engagement
- Promoting a healthy lifestyle through physiotherapy – transferring to fully online mode
- Launching a dedicated info-line for Q&A and Covid-19 related whistleblowing
- Vaccination against Covid organised at company locations
- Webinars and Q&A sessions with epidemiologists
- Closed group on the social network Facebook for keeping up commitment

You actually implemented a remarkable number of activities in 2021. Thanks very much for the insight into your activities in relation to Covid-19.

Thanks to you as well.

Interview: November 2022



Modern technologies and achievements of science have helped to develop vaccines against the greatest pandemic of the last century, affecting all the countries around the world. Vaccination against Covid-19 allows us to gradually return to normal daily life, and our common goal now is to achieve collective immunity. More and more colleagues in our company have been vaccinated, and each of them has their own reasons for doing so.

SOME OF OUR COLLEAGUES SHARE THEIR THOUGHTS ON,

WHY DID I GET VACCINATED AGAINST COVID-19



REINHOLD SCHNEIDER
SCHWENK Latvia Chairman of the Management Board
SCHWENK Northern Europe CEO

I am vaccinated as I want my family, my colleagues and my friends to be safe and healthy when I meet them. I feel responsible to support whole society going back to normal life without restrictions of free movement.

I want to see people smiling and not their face mask. I want to see colleagues in real life and not only on PC. I want children go back to school and university and grandparents meet them again; that's why I am vaccinated.

SCHWENK

Picture: Vaccination Campaign Poster | SCHWENK



Picture: Linda Sedlere | SCHWENK



Picture: Health & Safety Kit | SCHWENK



Picture: Door stickers, used to mark the work areas such as offices or meeting rooms | SCHWENK



Picture: Online Meeting SCHWENK Latvia | SCHWENK

SOCIETY AND ENGAGEMENT

We are represented throughout Germany with our numerous locations and companies. This supports the local economy by increasing employment, paying taxes and bringing our supply chain close to our locations. In addition to our business responsibilities, we consider it our duty to participate in public life. So we also get involved in what is happening in the region around our locations. We all benefit from open discussion, social projects and community involvement.

DONATIONS AND SPONSORSHIPS

We support selected associations and activities around our location with our donations and sponsorships. We are able to support regional environmental, social and cultural projects in our regions. This means that we contribute to the quality of life in the cities and communities where we work. We pass on the social responsibility that we practise in the company to our successors in the company in the earliest years of their employment. For example, some of our trainees organise a donation-based Christmas market every year, with the income going to community projects. We have also maintained close contacts and cooperation with schools, universities and other educational establishments for many years. We take the topic of road safety very seriously. Our "Safety with SCHWENK" programme teaches the youngest children everything they need to know about blind spots, the dangers of road traffic and how to behave correctly on the road.

BEING LOCAL AND PART OF THE COMMUNITY



Picture: Concrete mixer in front of the Ulm cathedral || SCHWENK

REGIONS, BUILDING AND CULTURE

We combine all this in our strong involvement in the association for supporting the cathedral in Ulm, the city where we started.



HUMANITARIAN AND SOCIAL PROJECTS

We make our decisions based on our responsibility to society. It is up to us to help those who most need help. We support them with a wide range of different projects.



ENVIRONMENTAL AND CLIMATE PROJECTS

Our production process means that we are encroaching on nature and the landscape – this is unfortunately unavoidable. We are fully aware of this and so we support special environmental and climate projects.



SPORTING AND CULTURAL ASSOCIATIONS

We can all experience social cohesion, community and family values in sporting and cultural associations. We want to help to make sure that our society has continuing access to a wide range of recreational options and opportunities to play various sports.



RESEARCH AND EDUCATIONAL PROJECTS

Success for us is based on continuing development. So we also support scientific projects in the field of building materials and a wide range of educational projects.

ASSOCIATIONS AND SOCIETIES

The principle of working together is also applicable to the associations and societies with which we are involved. In addition to memberships of industrial associations such as the Verein Deutscher Zementwerke e.V. (VDZ), the Cembureau and the Global Cement and Concrete Association (GCCA), which are actively involved in promoting sustainability in the construction industry, SCHWENK is also a member of a number of local associations involved in the environment, education and culture.



STAKEHOLDER RELATIONSHIPS

FOR DIALOGUE AND EXCHANGE

STAKEHOLDER COMMUNICATION

As a company, we are faced with various stakeholder requirements and expectations. To identify needs and trends, open communication and the creation of opportunities for exchange are essential for us. We identify questions, suggestions and concerns on the part of the individual stakeholder groups and develop targeted solutions. When preparing necessary requests, such as for rock extraction, we involve the local population as early as possible through information events. Together, we work out concepts for environmentally compatible rock quarrying. At our customer events, such as concrete seminars, customers have the opportunity to raise current issues and actively discuss challenges and measures with us. We promote continuous dialogue with our employees through our organisational structure, our works meetings and the intranet. With the introduction of new technical solutions and increased digitisation, we are currently working to further improve internal communication. In this way, we want to make information faster and more easily accessible and strengthen collaboration.

Relationships and open dialogue with internal and external stakeholders are an important part of our culture and our daily work. So we do whatever it takes to develop sustainable and open collaboration between employees, with our neighbours, as well as with the local community, industry, suppliers, municipalities and government institutions.



Picture: SCHWENK meeting room | SCHWENK

STAKEHOLDERS & HOW WE ENGAGE



IN FOCUS: COMMUNITY

FOR A STRONG COMMUNITY

People and the environment have always been among core values for Schwenk in all company locations. We see building strong communities and cities as part of our vision for a sustainable future.

Antra Savlevica, Communication manager in SCHWENK Latvia, talks about our community support program and what being a good neighbour really means.



Picture: Antra Savlevica | SCHWENK

So what does it mean to you – to be a good neighbour?

In Latvia we have a very special situation – Broceni city, where our cement plant is located, grew and developed in close connection with the beginnings of cement production industry in the region. We have always lived very closely side by side. There are families where many generations work in the industry. We are the only cement producer in Latvia and it makes us feel really privileged to continue the industry tradition, but at the same time we are also responsible for maintaining the legacy and innovating for the future. We are happy to have one of the most modern cement plants in Europe and this is at the heart of our efforts to increase our positive impact on our neighbours.

What are core principles of SCHWENK's community relations in Latvia?

First of all, there is open dialogue among all stakeholder groups. We interact openly not just about positive events and aspects, but also about critical issues that are of concern to the community, such as transport flow, the proximity of the industrial production facility to their homes and gardens etc. We have always accepted a high degree of responsibility for any negative impact our plant might have and been active in improving the situation as much as we can. Secondly, we also have a great community investment program, through which we support various social groups, community projects and initiatives.

Tell us more about your support programmes.

Our social investment programme is built around our values and one of our main goals is to empower communities and develop regional potential. One of our core activities is an open project competition for social projects and initiatives, implemented by community organisations and individuals. Once a year we ask for applications and provide funding for up to 10 projects covering a variety of areas – education, integration, health and safety, improvements of infrastructure, empowerment of vulnerable social groups etc. Another important area is support for STEM education. We provide scholarships for regional youth in engineering and technical

studies, our experts are involved in scientific work with young people at school and we welcome several trainees each year. The third area I would like to highlight is activities for maintaining the legacy of cement production and for supporting people, who have worked in the industry before us. We organise a special event in our location during Museum Nights in May. This is great opportunity to gain insight into historical developments, to evaluate how the industry has changed over time and to visit our plant in a guided bus tour. Apart from this, we have launched our senior support program, which is dedicated to elderly people, who used to work for the industry in previous years and might need some support nowadays.

And in 2021 you took part in a special cooperation to rebuild a historic site in Latvia..

Yes, we are happy and proud to support the renovation of a historic building in Riga – the Agenskalns market. SCHWENK provided more than 500 cubic meters of concrete for renovating the huge three-storey building. This really is a highly significant project for Latvia and Riga, as the building and market complex have been included in the list of our cultural heritage.

What do you think is the most important factor when it comes to sustainable community relations?

The most important factor is a thoroughly sustainable and responsible culture, which is part of all activity and all decisions. Also the openness and willingness to make the world a better place for our children.

Thank you Antra for sharing your way of working with the community and for describing your support programmes.

It's a pleasure. Thank you as well.

Interview: November 2022



Picture: Announcing the support program for industry seniors | SCHWENK



Picture: Museum Nights | SCHWENK



Picture: Community event during Museum Nights | SCHWENK



Picture: Notice of STEM scholarship | SCHWENK



Picture: Participants in the SCHWENK community competition | SCHWENK

APPENDIX

KPIs	SCHWENK Building Materials Group	SCHWENK Germany	SCHWENK Northern Europe	SCHWENK Lithuania
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General information

Investments	2021	2021	2021	2021
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Investments	40.3 million €	-	-	-
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Sites	2021	2021	2021	2021
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Cement plants	6	4	1	1
Sand & gravel plants	10	7	3	0
Concrete plants	139	133	5	1

Share of total sales	2021	2021	2021	2021
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Cement	-	45 %	90 %	99 %
Sand & gravel	-	5 %	2 %	0 %
Concrete	-	45 %	7 %	1 %
Pumps	-	5 %	1 %	0 %

Sales	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
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Cement	-	-	-	3.8 million t	4.1 million t	4.0 million t	1.6 million t	1.5 million t	1.5 million t	-	1.2 million t	1.4 million t
Sand & gravel	-	-	-	3.1 million t	3.0 million t	2.7 million t	0.8 million t	0.7 million t	0.8 million t	-	-	-
Concrete	-	-	-	3.9 million m ³	3.9 million m ³	3.7 million m ³	0.2 million m ³	0.1 million m ³	0.2 million m ³	-	0.05 million m ³	0.02 million m ³
Pumps	-	-	-	3.5 million m ³	3.4 million m ³	3.1 million m ³	0.1 million m ³	0.1 million m ³	0.1 million m ³	-	-	-

Climate protection

	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
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Specific net CO ₂ emissions (per ton cement equivalent)	-	-	-	435	432	438	543	512	495	788	730	738
Specific net CO ₂ emissions (per ton clinker)	-	-	-	528	534	537	606	578	569	891	837	837
Clinker/cement factor	-	-	-	79.7%	78.7%	79.4%	89.6%	88.6%	87.0%	87.7%	86.6%	86.1%
Proportion of alternative fuels	-	-	-	92.3%	91.0%	90.3%	77.0%	84.1%	89.5%	2.8%	6.3%	8.1%
Proportion of biomass	-	-	-	31.6%	31.0%	32.1%	35.1 %	39.4%	44.7%	1.0%	4.0%	5.0%

Raw materials	2021	2021	2021	2021
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Proportion of natural raw materials used in cement production that are replaced by alternative raw materials	10.77 %	13.28 %	2.42 %	3.40 %
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KPIs	SCHWENK Building Materials Group	SCHWENK Germany	SCHWENK Northern Europe	SCHWENK Lithuania
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	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
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Limit value ammonia (NH ₃) emissions in mg/m ³	-	-	-	30	30	30	50	50	50	30	30	30
Ammonia (NH ₃) emissions in mg/m ³	-	-	-	10.9	7.8	7.1	1.4	1.7	6.2	0.6	0.9	0.7
Limit value for NOx emissions in mg/m ³	-	-	-	200	200	200	500	500	500	500	500	500
NOx emissions in mg/m ³	-	-	-	190.8	176.1	183.8	460.6	412.2	399.9	437.5	330.2	381.3
Limit value for dust emissions in mg/m ³	-	-	-	10	10	10	20	20	20	20	20	20
Dust emissions in mg/m ³	-	-	-	2.7	4.0	4.0	6.1	6.0	9.0	2.7	5.1	9.7
Limit value for mercury emissions in µg/m ³	-	-	-	30	30	30	50	50	50	50	50	50
Mercury emissions in µg/m ³	-	-	-	9.7	11.4	8.2	6.4	0.04	0.2	0.2	0.5	4.1

Development Fuel use	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
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Development of alternative fuel consumption based on fuel energy consumption	-	-	-	92 %	91 %	90 %	77 %	84 %	89 %	3 %	6 %	8 %
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Alternative fuel mix in clinker production based on fuel energy consumption	2021	2021	2021	2021
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BGS	-	83 %	80 %	15 %
Used tyres	-	6 %	7 %	44 %
Sewage sludge	-	6 %	0 %	41 %
Paper fibre residues	-	1 %	0 %	0 %
Animal meal	-	4 %	0 %	0 %
Other	-	0 %	2 %	0 %

Alternative fuel mix in clinker production based on amount use	2021	2021	2021	2021
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BGS	-	465,345	131317.25	2093.56
Used tyres	-	27,553	10273.26	5048.24
Sewage sludge	-	536,002	0	13063.98
Paper fibre residues	-	23,646	0	0
Animal meal	-	30,924	0	0
Other	-	0	6262.2	0

APPENDIX

KPIs	SCHWENK Building Materials Group	SCHWENK Germany	SCHWENK Northern Europe	SCHWENK Lithuania
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■ Logistics

Vehicles	2021	2021	2021	2021
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Cement	483	-	-	-
Sand & Gravel	66	-	-	-
Concrete	209	-	-	-
Concrete pumps	203	-	-	-
Suppliers	>700	-	-	-

■ Water

Cement manufacture	2021	2021	2021	2021
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Drinking water consumed in litres	-	139 million l	0.75 million l	16.3 million l
Average specific water consumption l/t cement	-	193 l/t	40 l/t	1240 l/t

■ Employees

Employment	2021	2021	2021	2021
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Number of employees	3166	2176	378	612
Full-time employees	-	90.6 %	98.1 %	98.5 %
Part-time employees	-	9.4 %	1.9 %	1.5 %

Period of employment	2021	2021	2021	2021
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≤4 years	-	38 %	38 %	36 %
5-10 years	-	18 %	23 %	14 %
11-19 years	-	18 %	33 %	24 %
≥20 years	-	26 %	6 %	26 %

Age	2021	2021	2021	2021
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Average age	45.4	-	-	-
≤29 years	14 %	17 %	9 %	5 %
30-49 years	42 %	40 %	62 %	34 %
≥50 years	45 %	43 %	29 %	60 %

KPIs	SCHWENK Building Materials Group	SCHWENK Germany	SCHWENK Northern Europe	SCHWENK Lithuania
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Training	2021	2021	2021	2021
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Trainee ratio	5.2 %			
Number Qualified jobs	12			
Employment of trainees	91 %			

■ Occupational health and safety

Accident rate (LTIFR)	2021	2021	2021	2021
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Cement		4.2	4.5	2.4
Sand & Gravel		45.2	0.0	-
Concrete		31.3	0.0	8.9
Concrete pumps		74.9	-	-

SCHWENK Building Materials Group

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