

Production

Principles, Processes and Instruments

Production in harmony with the environment is a matter of great importance for Wienerberger. For us, the conservation of resources is a key aspect in production. In particular, we focus on the responsible use of raw materials, energy and water. We constantly work on contributing to the fight against climate change through greater energy efficiency and the reduction of our CO₂ emissions. At the same time, we strive to increase the amount of recycled material used in all business units, provided this is technically and economically feasible.

Research and development (R&D) are among the priorities of Wienerberger's strategic planning. One of the core activities of R&D is to optimize production processes and to develop innovative products and services (see chapter "Products" from page 74). R&D expenditure in 2017 amounted to € 11 million, which corresponds to 0.4% of the Group's revenues.

Environmentally relevant aspects have also been integrated into the company's quality management systems (QMS), which are certified according to ISO 9001 at almost all our production sites. Where appropriate, some production sites have also been certified according to ISO 14001 (Environmental Management Systems). Moreover, all Steinzeug-Keramo production sites and the Pipelife site in Germany have already been certified according to DIN EN ISO 50001:2011 (Energy Management Systems).

Technical controlling systems have been installed in all production areas of the Wienerberger Group. These systems record all production-related data required for the management of the company and permit the internal benchmarking of production sites against one another.

Results of our 2014 Materiality Analysis

The results of our materiality analysis on environmental aspects in production and on our supply chains are outlined on page 58 of our 2016 Sustainability Report.

The results of our materiality analysis provide the basis for our five-year plan of action, the Wienerberger Sustainability Roadmap 2020. The production-related targets and measures of the Wienerberger Sustainability Roadmap 2020 are summarized at the end of this chapter under "Targets and Measures Relating to Production".

Collection of Indicators, Restatements

The data contained in this chapter, unless otherwise indicated, exclusively refer to our production sites. In the course of the further development of data collection throughout the Wienerberger Group, the indicators concerned were adjusted accordingly. In the interest of transparency and comparability, the previous year's figures were restated. All adjustments and restatements made are explained in the following and, in addition, referred to in footnotes to the tables.

Since 2017, strategic decisions regarding sustainability management at the Pipelife production site in North America have no longer been taken by the Pipelife Business Unit, but by the North America Division. In the reporting period, however, the production site is no longer part of Pipelife's and not yet part of North America's Sustainability Roadmap 2020. This change has an impact on the indicators relating to Pipelife's and North America's quantitative targets, but it does not influence the production-related indicators, which are presented by product group. The integration of the production site into the Sustainability Roadmap 2020 is being prepared.

All non-financial indicators are calculated on the basis of non-rounded values. Electronic data processing may result in rounding differences.

Restatements

Waste quantity at Semmelrock: Following an update of the data base, the waste quantities reported by Semmelrock for 2016 were corrected and the indicators of the Wienerberger Group were restated for 2016. The waste quantity indicators for other reporting years are not concerned by this adjustment.

Percentage of recycled material at Pipelife: Following an update of the data base, the indicator regarding the percentage of recycled material used per ton of products produced reported by Pipelife in the 2016 Sustainability Report was restated. The corresponding indicators for other reporting years are not concerned by this adjustment.

Net addition to inventories in m² at Clay Building Materials Europe (CBME): Following an update of the data base, the net addition to inventories in m² in the roof product group reported by CBME in the 2016 Sustainability Report for the reporting year 2016 was restated. The corresponding indicators for other reporting years are not concerned by this adjustment.

Index of specific energy consumption at CBME: Following an update of the data base, the indices in % based on kWh/ton (2010 = 100%) reported by CBME in the 2016 Sustainability Report for 2015 and 2016 were restated.

Index of specific energy consumption in ceramic pipe production: Following an update of the data base, the index of specific energy consumption in ceramic pipe production reported by Steinzeug-Keramo in the 2016 Sustainability Report for the reporting year 2016 was restated. The adjustment has no influence on the indicator published for the Wienerberger Group's entire ceramic production. The indicators regarding the index of specific energy consumption in ceramic pipe production for other reporting years are not concerned by this adjustment.

Volumes Sold by Product Group

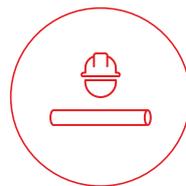
The following diagram illustrates the total volumes of products supplied by the Wienerberger Group for building construction and infrastructure solutions in 2017.



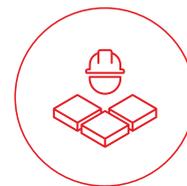
167,000
houses built



293,000
roofs covered



648,000
km pipes laid



12,000,000
m² surface paved

Environmental Aspects in Production: Energy Efficiency

The following indicators on energy consumption refer to the entire Wienerberger Group. Compared with the previous year, the Group's total energy consumption increased by 3.9% in 2017. The main reason for the increase is the higher volume of brick and plastic pipe production as well as the increase in concrete paver

production at some production sites. Changes in the product mix in plastic pipe and concrete paver production also led to an increase in energy consumption in absolute terms in 2017. The share of renewable energy sources in the consumption of electricity, based on kWh per ton, increased significantly to 37% in 2017, up by 19.4 percentage points from the previous year.

Energy consumption ¹⁾ in GWh	2015	2016	2017	Chg. in %
Natural gas	6,302	6,331	6,665	+5.3
Coal	191	114	50	-56.2
Fuel oil	11	7	7	-1.0
Liquefied natural gas	48	60	55	-8.7
Electricity	1,076	1,078	1,112	+3.2
Wienerberger Group	7,628	7,591	7,889	+3.9
Share of renewable energy in the consumption of electric energy	27%	31%	37%	+19.4

1) Total energy consumption includes energy consumed in production, but excludes administration, except for countries where separate accounting is not possible. // All non-financial indicators are calculated on the basis of non-rounded values. Electronic data processing may result in rounding differences.

Continuous efforts are being made by Wienerberger to convert its production processes to low-emission energy sources. As in previous years, the substitution of coal, liquefied natural gas and fuel oil by other sources of energy is clearly reflected in the figures for 2017. The North America Division succeeded in converting all its main production sites completely from coal to natural gas in 2017. The Group-wide consumption of coal was reduced by more than half in 2017 compared to the previous year's level (-56.2%).

Specific energy consumption

The specific energy consumption (calculated as an index in % based on kWh/ton) reflects the development of the individual product groups over time, with the values reported for a specific reference year serving as the basis for index calculation. Up to 2016, the figures from 2010 were used as a basis. However, given recent changes

in the methods of data collection and the integration of new product groups in 2016 (see 2016 Sustainability Report, pages 58 and 59, collection of indicators, restatements), 2010 can no longer be used as the reference year for certain product groups, as the data are no longer comparable. This concerns data on ceramic pipes as well as concrete products in North America. Since 2016, we have therefore used the indicators of 2013 as the new reference value for the index of specific energy consumption (based on kWh/ton) for the entire Wienerberger Group.

In 2017, specific energy consumption dropped by 0.8% from the previous year's level in the Wienerberger Group as a whole and by 1.7% in ceramic production. Compared to the baseline year 2013, the reduction amounted to 0.9% for the Wienerberger Group and 2.4% for ceramic production.

Index of specific energy consumption ¹⁾ <i>in % based on kWh/ton (2013 = 100%)</i>	2015 ²⁾	2016	2017	Chg. against 2016 in %	Chg. against 2013 in %
Clay blocks	94.4	93.4	91.2	-2.3	-8.8
Roof tiles	89.1	87.9	87.8	-0.1	-12.2
Facing bricks	99.7	101.7	101.1	-0.6	+1.1
Ceramic pipes ³⁾	103.1	111.8	122.0	+9.1	+22.0
Ceramic production	101.7	99.3	97.6	-1.7	-2.4
Plastic pipes	97.1	100.8	101.5	+0.7	+1.5
Concrete and calcium silicate products North America	108.2	102.7	100.3	-2.4	+0.3
Concrete pavers	93.7	98.1	100.1	+2.0	+0.1
Wienerberger Group	101.3	100.0	99.1	-0.8	-0.9

1) Total energy consumption includes energy consumed in production, but excludes administration, except for countries where separate accounting is not possible. // 2) Tondach Gleinstätten included from 2015. // 3) The indicators for 2016 were restated on account of an update of the data base and the index based thereon was recalculated for 2016.

In 2017, Wienerberger's continuous efforts to reduce specific energy consumption were particularly successful in the Clay Building Materials Europe (CBME) Division. The higher volume of production and the associated optimal utilization of capacities at the CBME production sites made an additional contribution to the reduction of specific energy consumption. In particular, specific energy consumption decreased by 2.3% in clay block production. Throughout 2017, CBME continued the rollout of the "Plant Improvement Program". Details on the current program and CBME's ongoing activities aimed at enhancing energy efficiency are described on page 61 of the 2016 Sustainability Report.

The rise in specific energy consumption in the production of ceramic and plastic pipes as well as concrete pavers in 2017, as compared to the previous year's values, was again due partly to further developments in the product mix toward products requiring more energy in production, and partly to lower capacity utilization in ceramic pipe production and at some concrete paver production sites.

The Clay Building Materials Europe Division has developed new roof tile and facing brick products, one of the objectives being to increase resource efficiency and to further improve the product properties. Therefore, the index of specific energy consumption for these two product groups is also shown per square meter of product surface.

Index of specific energy consumption CBME ¹⁾ <i>in % based on kWh/m² (2013 = 100%)</i>	2015 ²⁾	2016	2017	Chg. against 2016 in %	Chg. against 2013 in %
Roof tiles ³⁾	88.0	84.4	83.6	-1.0	-16.4
Facing bricks	93.5	95.6	95.2	-0.5	-4.8

1) Clay Building Materials Europe: total energy consumption includes energy consumed in production, but excludes administration, except for countries where separate accounting is not possible. // 2) Tondach Gleinstätten included from 2015. // 3) Following an update of the data base, net additions to inventories in m² reported for 2016 were restated and the index based thereon was recalculated for 2016.

For Clay Building Materials Europe (bricks) and Pipelife (plastic pipes), we refer to the figures from 2010 as the reference value for the quantitative energy efficiency targets to be reached by 2020. Therefore, the index of specific energy consumption for most product groups can also be shown relative to 2010 as the reference year (excluding concrete and calcium silicate products in

North America and ceramic pipes). The target of minus 20% in clay block production was attained in 2016 and even exceeded in 2017 (-22.5%). In roof tile production, we are on track (-14.3%) to reach the target in the near future. In the other product groups, we will continue to step up our efforts in order to reach our self-imposed targets in 2020.

Index of specific energy consumption ¹⁾ <i>in % based on kWh/ton (2010 = 100%)</i>	2015 ²⁾	2016	2017	Chg. against 2016 in %	Chg. against 2010 in %
Clay blocks	80.2	79.3	77.5	-2.3	-22.5
Roof tiles	87.0	85.8	85.7	-0.1	-14.3
Facing bricks, CBME only	96.7	98.4	98.0	-0.4	-2.0
Facing bricks incl. North America	102.2	104.3	103.6	-0.6	+3.6
Plastic pipes	94.6	98.2	98.9	+0.7	-1.1
Concrete pavers	88.9	93.1	95.0	+2.0	-5.0
CBME total ³⁾	92.0	89.9	88.3	-1.7	-11.7

1) Total energy consumption includes energy consumed in production, but excludes administration, except for countries where separate accounting is not possible. // 2) Tondach Gleinstätten included from 2015. // 3) Following an update of the data base, the indices reported by CBME for 2015 and 2016 were restated.

Environmental Aspects in Production: Climate Protection and CO₂ Emissions

For the collection of CO₂ emission data, we apply the method of the European Union Emissions Trading Scheme (ETS system), which only records direct CO₂ emissions resulting from production processes, excluding indirect CO₂ emissions resulting from the use of electricity. Accordingly, the only relevant data are CO₂ emissions from our ceramic production (bricks and ceramic pipes; Scope 1).

CO₂ emissions from primary energy sources vary in line with energy consumption, whereas so-called process emissions result from the raw material and, in clay block production, from the use of poreforming agents. The increase in CO₂ emissions in absolute terms within the ETS system results partly from further developments in the product mix in some product groups and partly from the higher volume of production due to more incoming orders in Clay Building Materials Europe. Electric energy is used in the production of plastic pipes and concrete pavers, with the related CO₂ emissions being attributed to the electric power producer.

CO₂ emissions <i>in kilotons per year</i>	2015	2016	2017	Chg. in %
From primary energy sources	1,080	1,074	1,126	+4.8
From processes	718	720	800	+11.2
Total - covered by ETS ¹⁾	1,798	1,793	1,926	+7.4
Plants not covered by ETS ²⁾	266	253	245	-3.0
From biogenic materials ³⁾	240	249	268	+7.7

1) Source: Community Independent Transaction Log (CITL) // 2) Calculation in accordance with national rules (Switzerland) or EU standard emission factors. For plants in the USA, CO₂ process emissions are also reported. // 3) Quantities derived from Wienerberger's CO₂ monitoring in accordance with national rules.

Specific CO₂ emissions

Within the framework of the materiality analysis performed in 2014, our stakeholders only ranked fuel-related CO₂ emissions, which can be directly influenced by Wienerberger, as a material aspect in the fight against climate change. This is also reflected in the target definition of the Clay Building Materials Europe Division for the reduction of specific CO₂ emissions from primary energy sources by 20%, as compared with 2010.

Changes in specific energy consumption provide an approximate basis for the assessment of target attainment, as the volume of CO₂ emissions correlates with the quantity and composition of primary energy sources used. Reductions can be achieved through efficiency enhance-

ment in production (i.e. lower energy consumption per ton of products produced), on the one hand, and the replacement of CO₂-intensive fuels (coal, fuel oil) by less CO₂-intensive or renewable energy sources, on the other hand. Thus, the ongoing conversion to natural gas as a fuel also contributes to the reduction of specific CO₂ emissions.

On account of the transition to the third trading period of the European Union Emissions Trading System, emission data collected in 2013 are used as the new reference base for the calculation of specific CO₂ emissions from primary energy sources (in % based on kg CO₂/ton).

Index of specific CO₂ emissions ¹⁾ <i>in % based on kg CO₂/ton (2013 = 100%)</i>	2015 ²⁾	2016	2017	Chg. against 2016 in %	Chg. against 2013 in %
Clay blocks		92.1	89.6	-2.8	-10.4
Roof tiles		87.1	87.4	+0.3	-12.6
Facing bricks		95.0	93.0	-2.0	-7.0
Ceramic pipes		111.9	123.8	+10.7	+23.8
Ceramic production	99.4	96.1	93.9	-2.3	-6.1

1) Specific CO₂ emissions exclusively refer to fuel emissions. // 2) Tondach Gleinstätten included from 2015.

In ceramic production, the index of specific CO₂ emissions from primary energy sources in kg CO₂ per ton of products produced was reduced by a satisfactory 2.3%, as compared to the previous year (see page 57). The reduction in specific CO₂ emission were most pronounced in the production of clay blocks (-2.8%) and facing bricks (-2.0%). Specific CO₂ emissions in roof tile production increased slightly in 2017 (+0.3%), although specific energy consumption declined (-0.1%). This is due to the slight increase in specific thermal energy consumption in roof tile production, while the specific consumption of electric energy dropped significantly. The following table (index of specific CO₂ emissions in % based on kg CO₂/m²) shows that specific CO₂ emissions per m² of roof tiles produced were reduced in 2017. The main factors accounting for the 10.7% increase over the previous year's value in the production of ceramic pipes are further developments in the product mix and the lower level of capacity utilization at some production lines.

Specific CO₂ emissions from primary energy sources in ceramic production dropped more strongly (-2.3% as compared to 2016) than specific energy consumption (-1.7%). This is due to the consistent substitution of CO₂-intensive energy sources, such as coal and fuel oil, by natural gas.

The Clay Building Materials Europe Division developed new roof tile and facing brick products, one of the objectives being to increase resource efficiency and to further improve the product properties. To reflect this development more clearly, the index of specific CO₂ emissions from primary energy sources for these two product groups is also shown per square meter of product surface. Based on this indicator as well, emission volumes were found to develop in parallel with the reduction of thermal energy consumption.

Index of specific CO₂ emissions CBME ¹⁾ <i>in % based on kg CO₂/m² (2013 = 100%)</i>	2015 ²⁾	2016	2017	Chg. against 2016 in %	Chg. against 2013 in %
Roof tiles ³⁾	86.9	83.7	83.2	-0.6	-16.8
Facing bricks	91.7	93.6	93.2	-0.4	-6.8

1) Specific CO₂ emissions exclusively refer to fuel emissions. // 2) Tondach Gleinstätten included from 2015. // 3) Following an update of the data base, net additions to inventories in m² reported for 2016 were restated and the index based thereon was recalculated for 2016.

Information on the carbon footprint generated upstream of concrete paver production (Scope 2) and specific indirect CO₂ emissions from electricity used in plastic pipe production is contained on page 64 of the 2016 Sustainability Report.

Environmental Aspects in Production: Resource Efficiency and Waste Management

Wienerberger is making a continuous effort to increase resource efficiency in production and, at the same time, further improve the properties of its products. Our particular focus is on reducing raw material consumption

and using secondary raw materials in those areas of production where it is economically and technically feasible. We are also working on a continuous reduction of scrap rates and the recycling of production waste and residual substances into production. Figures on the total amount of raw materials used in the Wienerberger Group cannot be disclosed for reasons of data protection and industrial secrecy.

A total of 167,084 tons of waste was generated by Wienerberger in 2017, 1% of which was hazardous waste. As in previous years, almost all the waste generated by the

Waste

in tons



1) Following an update of the data base, the quantities of waste reported for 2016 in the 2016 Sustainability Report were corrected for concrete paver production (Semmelrock), and the indicators of the Wienerberger Group were restated for 2016. The indicators of waste quantities from other reporting years are not concerned by this restatement.

Wienerberger Group is non-hazardous waste, which was collected and recycled in 2017 at a rate of 77%.

Our supply chain

Within the framework of our business relations, we also pay attention to the observance of ecological and social standards by our suppliers. All business areas in

Europe specify their minimum standards in specific “supplier codes of conduct”, which must be signed by the suppliers upon signature of the contract and have to be strictly observed. Wienerberger is working on a Group-wide “Supplier Code of Conduct” and a system of supplier management, which takes social and ecological criteria into account. In line with the Group’s supplier management strategy, the North America Division intends to elaborate a supplier guideline aimed at promoting the re-use and/or recycling of packaging material. For other relevant aspects of our supply chain, please refer to page 65 of the 2016 Sustainability Report.

Environmental Aspects in Production: *Sparing Use of Water*

We are making every effort to use water sparingly, for instance by running it in closed circuits and drawing primarily on our own wells. Due to the significant increase of production volumes in some areas, the Wienerberger Group’s total consumption of water in 2017 was 0.7% higher than in 2016. The percentage drawn from public networks remained almost unchanged, although highly diverging developments were observed in the individual Business Units.

Water consumption		2015	2016	2017	Chg. in %
Wienerberger Group	in million m ³	4.0	4.2	4.2	+0.7
of which withdrawal from public networks	in %	34.3	33.5	33.7	-

Specific water consumption

In 2017, total specific water consumption, based on net additions to inventories, was reduced in all product groups. Besides the Wienerberger Group's

commitment to a sparing use of water, if possible in closed circuits, changes in the product mix and lower production volumes in some areas also contributed to the reduction in specific water consumption in 2017.

Specific water consumption <i>in m³/ton</i>	2015	2016	2017	Chg. in %
Brick products	0.154	0.154	0.148	-3.8
Ceramic pipes	0.228	0.263	0.242	-7.8
Plastic pipes	4.700	5.110	5.036	-1.5
Concrete pavers	0.051	0.055	0.050	-8.5
Concrete and calcium silicate products North America	0.389	0.401	0.329	-18.1

Targets and Measures Relating to Production

The following targets and measures were defined by the Managing Board of Wienerberger AG and the management of the individual Wienerberger Business Units on the basis of the materiality matrix developed in 2014. They are part of the Wienerberger Sustainability Roadmap 2020.

The data on North America and Pipelife do not include the Pipelife production site in North America. This influences the development of indicators relative to the quantitative target definitions for North America and Pipelife as compared to previous years.

Aspects of our production

Energy efficiency

Clay Building

Materials Europe

Quantitative target

- › Specific energy consumption in production is to be reduced by 20% by 2020, as compared to 2010.

2017

- › Specific energy consumption in production was 11.7% below the value of 2010 (calculated as an index in % based on kWh/ton; 2010 = 100%).
- › CBME further pursued the strategy of its R&D roadmap to reduce energy consumption.
- › Benchmarks were set and best practices exchanged.
- › The Energy Award was again given out as an incentive for the local companies.
- › Plans for the conversion of a pilot plant equipped with new technology for a significant reduction in specific energy consumption were finalized and work on the project was begun.

2018

- › The conversion of the pilot plant referred to above, originally planned for the end of 2017, is being implemented in the first half of 2018. The project had to be postponed on account of high capacity utilization and strong customer demand.
- › The findings obtained at the pilot plant will be rolled out.
- › Benchmark setting and the exchange of best practices are being continued.
- › Energy Awards will again be given out as an incentive for the local companies.
- › Specific investments are being made in order to further reduce energy consumption.

North America

Quantitative target

- › By 2017, the consumption of natural gas at selected production sites is to be reduced by 5% each, as compared to 2015.

2017

- › The consumption of natural gas at only one main production site was reduced by 4%, as compared to 2015. As a result of the conversion of selected production sites from high-emission energy sources to natural gas, the 5% target set for the reduction of natural gas consumption was not fully attained in 2017.
- › Electricity consumption at other selected production sites was further optimized.

2018

- › The North America Division will reduce its specific energy consumption (fuel and electricity) at all main production sites by another 2% compared to 2017 (calculated as an index in % based on kWh/ton).
 - › Appropriate measures to reduce energy consumption are being implemented and monitored.
-

Energy efficiency

Pipelife

Quantitative target

- › By 2020, specific energy consumption in production is to be reduced by 20%, as compared to 2010.

2017

- › Specific energy consumption in production was 5% above the comparable value of 2010.
- › The increase in specific energy consumption was analyzed and the main factors of influence were identified. The increase is primarily due to further developments in the product mix.
- › Projects aimed at reducing energy consumption in production were carried out at various production sites within the framework of “Energy Treasure Hunts”.
- › Local electricity saving initiatives were implemented.
- › The results of these local initiatives were analyzed and communicated internally via an interactive tool.
- › The performance of the individual local companies was compared.
- › Best practice examples were exchanged and benchmarks were set.

2018

- › The targets set for the reduction of specific energy consumption are being evaluated on the basis of the results of the analysis performed in 2017.
- › The processes described above are being continued.
- › The results are updated, analyzed and communicated internally via an interactive tool.
- › The performance of the individual local companies is compared.
- › Best practice examples are exchanged and benchmarks set.

Semmelrock

2017

- › Findings resulting from measures to enhance energy efficiency taken at a new production plant in Austria were rolled out to other country organizations.
- › A plan of action was elaborated for Semmelrock’s other production plants.

2018

- › The measures referred to above are being continued.

Steinzeug-Keramo

2017

- › Energy efficiency monitoring was continued at the production sites.
- › Internal quantitative targets were defined for individual production lines.
- › The working group set up in cooperation with CBME in the previous year continued its activities and regular exchanges of scientific data with Clay Building Materials Europe took place.
- › Projects aimed at a continuous increase in energy efficiency were implemented.

2018

- › The processes described above are being continued.
 - › As in the previous year, best practice examples are exchanged and benchmarks set.
-

Climate action
**Clay Building
Materials Europe**
Quantitative target

- › By 2020, specific CO₂ emissions from primary energy sources in production are to be reduced by 20% from their 2010 level.

2017

- › Specific CO₂ emissions from primary energy sources in production amounted to 96% of the value reported in 2013 (calculated as an index in % based on kg CO₂/ton; 2013=100%. Following the transition to the third EU emissions trading period in 2013, the level of CO₂ emissions in 2013 is now referred to as the new baseline for future developments).
- › CBME further pursued the strategy of its R&D Roadmap to reduce energy consumption and, consequently, specific CO₂ emissions from primary energy sources.
- › The Energy Award was again given out as an incentive for local companies.
- › Specific investments were made to reduce the volume of specific CO₂ emissions from primary energy sources.
- › Plans for the conversion of a pilot plant equipped with new technology for a significant reduction in specific energy consumption and the related specific CO₂ emissions were finalized and work on the project was begun.

2018

- › The conversion of the pilot plant referred to above, originally scheduled for the end of 2017, is being implemented in the first half of 2018. The project was postponed due to high capacity utilization and strong customer demand.
- › The essential findings from the pilot plant will be rolled out.
- › Benchmark setting and the exchange of best practices is being continued.
- › Energy Awards will again be given out as an incentive for the local companies to step up their efforts.
- › CBME will further pursue the strategy of its R&D Roadmap to reduce specific CO₂ emissions from primary energy sources.

North America
Quantitative target

- › Conversion of all main production sites from coal to natural gas by 2017.

2017

- › The target of converting 100% of the production lines at all main production sites from coal to natural gas was surpassed. All the Division's active production lines were converted from high-emission coal to low-emission natural gas.

2018

- › Additional measures aimed at reducing emissions are being evaluated.
-

Climate action

Pipelife

Quantitative target

- › By 2020, specific indirect CO₂ emissions (from electricity in production) are to be reduced by 20%, as compared to 2010.

2017

- › Indirect CO₂ emissions (from electricity in production) were 16% below the reference value of 2010 and slightly above the previous year's value as a result of further developments in the product mix.
- › Projects aimed at reducing specific CO₂ emissions were carried out at various production sites within the framework of "Energy Treasure Hunts".
- › Local initiatives to reduce emissions were implemented.
- › The results of the projects and initiatives aimed at reducing specific indirect CO₂ emissions from electricity in production were analyzed and communicated via an interactive tool.

2018

- › The processes described above are being continued.
- › The performance of the individual local companies is compared.
- › Best practice examples are being exchanged and benchmarks set.

Semmelrock

2017

- › Mix optimization, minimized use of cement and/or use of a binder with a lower percentage of cement clinker were evaluated.
- › Optimized formulations were rolled out.

2018

- › Further possibilities of minimizing the use of cement and/or using a binder with a lower percentage of cement clinker are being studied in cooperation with external partners.

Steinzeug-Keramo

2017

- › 100% of the electricity consumed came from renewable sources.
- › Within the framework of re-certification in accordance with Cradle to Cradle®, 5% of the annual CO₂ emissions generated at the company's production sites were offset through climate protection projects.
- › Internal quantitative targets were defined for individual production lines.
- › A working group organized regular exchanges of scientific data with Clay Building Materials Europe.

2018

- › 100% of the electricity consumed comes from renewable sources.
 - › Within the framework of environmental certification, 5% of the annual CO₂ emissions generated at the company's production sites will again be offset through climate protection projects.
-

Resource efficiency and waste management

Clay Building

Materials Europe

2017

- › The measures recommended on the basis of a study on the use of secondary raw materials, resource efficiency and waste management in brick production completed in 2016 were implemented.
- › A guideline for the use of additives was adopted and a new format of annual raw material reporting was introduced.

2018

- › The internally defined priority projects and initiatives will be implemented.
-

North America

2017

- › The closed resource cycle was further optimized.
- › New possibilities of using secondary materials as additives were tested.
- › An internal initiative was launched to identify sources of waste and reduce the volume of waste generated.
- › The recycling of packaging materials was extended.
- › The sale of products in “bulk bags” (stable, re-usable containers) instead of paper bags was implemented.

2018

- › The measures described above are being continued.
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Semmelrock

Quantitative target

- › The scrap rate in production is to be reduced by 50% by 2017. In 2014 (reference value) the scrap rate was 4.7%.

2017

- › The scrap rate in production was reduced by 45.3% from the value reported in 2014 and the target set for 2017 was almost attained. The scrap rate in 2017 was 2.6%, while the target for 2017 had been set at 2.4%.
 - › The central laboratory monitored the scrap rate in production on a monthly basis, taking into account previous findings and changes in the product portfolio.
 - › The scrap rate data were analyzed, individual production lines were classified according to the data obtained, and targeted optimization measures were taken.
-

Resource efficiency and waste management

Semmelrock

2018

- › A new target for the reduction of the scrap rate in production is defined.
- › The scrap rate is to be further reduced through the optimization of technologies, tools and processes as well as by raising our employees' awareness for resource efficiency in the plants.
- › The best practice measures implemented are being analyzed and further optimization measures will be derived from the results obtained.
- › Studies on a closed resource cycle in production are performed.
- › Future possibilities of concrete recycling, with a special focus on the re-use of dry scrap, are being evaluated.

Water

Pipelife

Quantitative target

- › The consumption of water from public networks is to be reduced to 0.55 m³ per ton of products produced by 2020.

2017

- › The consumption of water from public networks increased significantly over the previous year's level from 0.81 m³/ton in 2016 to 0.95 m³/ton in 2017, the main reason being the further development in the product mix.
- › The results of local initiatives were analyzed and communicated internally via an interactive tool.

2018

- › Further initiatives will be launched on the basis of the findings obtained.

Semmelrock

2017

- › The well-established practice of process water recycling was rolled out to two additional paver plants.
- › Work on a new technology for optimized water recycling in slab production was continued.

2018

- › A new technology for optimized water recycling in slab production will be introduced at a new production line.
-

Aspects along our supply chain

Availability of raw materials

Clay Building

2017

Materials Europe

- › All relevant clay pits and their characteristics were monitored and measures were taken to ensure the availability of raw materials.
- › A raw material availability benchmark was defined.

2018

- › The measures described above are being implemented and rolled out to newly acquired sites.
-

North America

2017

- › Continuous monitoring of raw material availability from own clay pits for at least ten years of operation on the basis of the “raw material availability map” was performed.

2018

- › The measures described above are being implemented consistently.
-

Pipelife

2017

- › A strategy for the avoidance of supply shortages was implemented on the basis of a list of the main product groups and their suppliers.

2018

- › The strategy for the avoidance of supply shortages is being continued.
-

Semmelrock

2017

- › The raw material procurement strategy was adapted step by step for application at country and plant level.

2018

- › The measures described above are being continued.
-

Steinzeug-Keramo

2017

- › All relevant sources of supply were monitored against the internal benchmark and measures to ensure the availability of raw materials were taken.
- › Clay suppliers were audited with a view to the availability of clay from their sources.
- › An analysis of suppliers of selected raw materials was performed and appropriate measures were implemented.

2018

- › Measures to ensure the availability of raw materials are being continued.
 - › Supplier management activities are being continued.
-

Use of secondary raw materials

Clay Building Materials Europe

2017

- › A research and development project on the use of secondary raw materials in brick production was completed.
- › Based on the analysis of the use of secondary raw materials in brick production, appropriate measures were taken.

2018

- › The internally defined priority projects and initiatives are being implemented.
-

North America

2017

- › The closed resource cycle in production was continuously monitored with a view to possible improvements.
- › Further possibilities of using selected secondary materials in production are being continuously evaluated.

2018

- › The measures described above are being continued.
-

Pipelife

Quantitative target

- › By 2020, the amount of recycled material per ton of products produced is to be increased to 70 kg.

2017

- › The amount of recycled material reached 67.2 kg/ton.
- › Research projects aimed at optimizing the ratio of primary and secondary raw materials in Pipelife products were continued.
- › The technical feasibility of the use of recycled materials was further studied and production sites suited for implementation of such projects were identified.
- › The results were analyzed and applied at additional production sites.

2018

- › The research projects are being continued and the most promising results are applied at additional production sites.
-

Use of secondary raw materials

Semmelrock

2017

- › A project on recycled concrete was launched in order to define an optimal technology for efficient concrete recycling and the amount of recycled concrete to be used.

2018

- › Based on the analyses performed, the project will be redefined.
-

Steinzeug-Keramo

2017

- › All the measures required within the framework of Cradle to Cradle® certification in 2016 were implemented to obtain Cradle to Cradle® re-certification in 2018.
- › The percentages of internal and external secondary raw materials used in production were evaluated in detail for all production lines. Currently, the average percentage of secondary raw materials is 40%. This percentage is continuously re-evaluated in light of ecological, technological and economic considerations.

2018

- › Possibilities of further improving the technical properties of materials with the highest possible recycling ratio are being studied.
- › All the necessary measures required for the scheduled Cradle to Cradle® re-certification were taken.

Avoidance and/or substitution of hazardous substances

At Group level and at Business Unit level

It goes without saying that Wienerberger meets all European, national and regional legal requirements regarding the avoidance and substitution of hazardous substances. Compliance with all legal provisions is continuously monitored and the necessary measures are taken without delay, whenever need rises.

Clay Building Materials Europe

2017

- › The revised internal guideline on the avoidance of hazardous substances was finalized and implemented throughout the Business Unit. The revised guideline provides for even stricter classification of inputs and contains clear, binding instructions for the production sites.
- › An annual raw material report with new disclosure requirements was drafted.

2018

- › The measures are being implemented according to the new guideline.
 - › On the basis of the new requirements laid down in the raw material report, compliance with the revised guideline will be monitored in cooperation with Internal Audit.
-

Protection of local residents, nature conservation and re-use of clay pits

*Clay Building**Materials Europe***2017**

- › The supplier code of conduct was made available to all local companies as a binding instrument. It demands that suppliers respect human rights and the principles of environmental protection.
- › Documents signed by suppliers are being administered centrally.
- › A new supplier management structure was elaborated for certain areas.

2018

- › The new supplier management structure is being implemented in selected areas.
-

*North America***2017**

- › The regular annual checks for dust emissions and water quality were performed at all production sites.
- › Open and transparent communication with local residents and local authorities was continued.

2018

- › The aforementioned measures are being continued.
-

*Pipelife***2017**

- › The “Pipelife Supplier Code of Conduct” for a responsible way of dealing with people and the natural environment continued to apply.

2018

- › The “Pipelife Supplier Code of Conduct” continues to apply.
-

Protection of local residents, nature conservation and re-use of clay pits

*Semmelrock***2017**

- › The supplier code of conduct was made available to all country organizations.
- › A solution for the central administration of supplier documents was developed.

2018

- › The supplier code of conduct will be applied in negotiations with suppliers by all country organizations as a binding instrument.
- › The supplier code of conduct will be published by all country organizations on their websites.

*Steinzeug-Keramo***2017**

- › Measures relating to nature conservation and the meaningful re-use of clay pits were implemented in accordance with the company's own standards.
- › A supplier audit was performed.

2018

- › The measures described above will be continued.
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