11. ENVIRONMENT

Environmentally conscious action is firmly integrated into the voestalpine Group's corporate philosophy. This concerns all areas of the production chain and focuses on the most economical use possible of resources—especially raw materials and energy—as well as on efforts to minimize the environmental impact of processes and products.

To achieve these goals, we utilize the best available technologies in voestalpine's production plants and continually work to boost efficiency, lower emissions, and reduce the consumption of energy in connection with the existent system of steel production. Our intensive work to research new, environmentally friendly production processes and, not least, to refine materials and products makes material contributions to the company's environmental footprint as well.

All of these activities are managed through transparent and efficient environmental management systems (EMSs) that have been widely implemented in the voestalpine Group.

voestalpine is committed to the following principles at all of its production facilities:

- >> To take comprehensive responsibility for our products
- >> To optimize the production processes
- >> To establish environmental management systems
- >> To integrate employees into these processes and ensure environmentally conscious conduct on the part of every one of them and
- >> To engage in open and professional dialogues

As a result of these consistent efforts, voestalpine has become a leader in the European steel industry, for example, with respect to emission intensity and resource efficiency.


41: Niobium
Nb
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Environmental protection is a core component of voestalpine's Corporate Responsibility Strategy. The following principles are enshrined in it.

Emissions in the Air, Soil, and Water: minimize using the Best Available Technologies

Process-related emissions cannot be entirely avoided due to the chemical-physical properties of existent production processes. We operate our production facilities pursuant to the principle of using the best available technologies as appropriate and in economically viable fashion. We also develop new approaches in order to minimize environmentally relevant effects on the air, soil, and water to the greatest extent possible.

Circular Economy & Life Cycle Assessment

We support holistic, comprehensive, and integrated analyses and assessments of materials ("life cycle assessments") as well as of all process and value chains within the parameters of the circular economy.

Energy and Climate Policy

Commitment to low-carbon production: We are meeting the challenge of decarbonizing the economic system in the long term not only through comprehensive research and development of new technologies, frequently via cross-sector cooperation agreements and projects. We also engage in an open and constructive dialogue with stakeholders such as political decision makers, the scientific community, technical colleges and universities as well as environmental organizations.

11.1 ENVIRONMENTAL MANAGEMENT SYSTEMS

About 60% of the 130 Group companies worldwide that are included in internal environmental data management use an environmental management system (EMS) pursuant to ISO 14001. These entities account for 100% of the company's crude steel production. About 15% of our facilities have also been validated under the EU's Eco-Management and Audit Scheme (EMAS), and more than 20% utilize a certified energy management standard pursuant to ISO 50001. The implementation of ISO 14001 at the Group's facility in Corpus Christi, Texas, USA, will be completed by the end of the business year 2019/20.

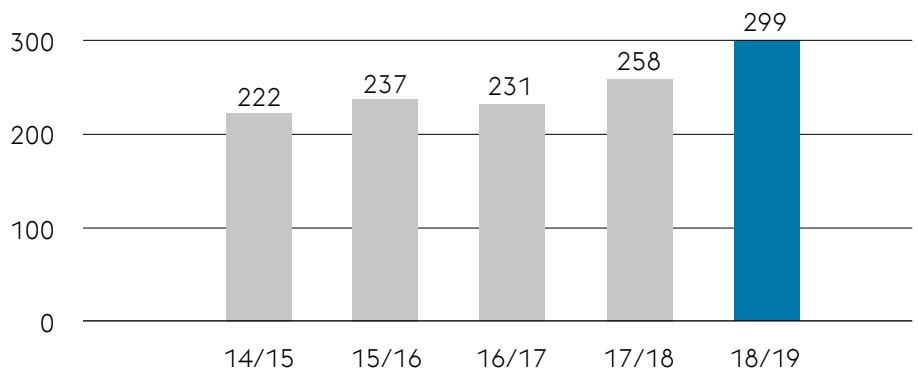
In September 2018, voestalpine was awarded the EMAS prize for the best environmental team by the Austrian Ministry of Sustainability and Tourism on account of the scope, effect, and communication of the company's policies under the Eco-Management and Audit Scheme.

11.2 OPERATING EXPENSES FOR ENVIRONMENTAL PROTECTION SYSTEMS

The company's environmental expenditures reflect the stringent nature of its standards regarding the environment and environmental technology. Current operating expenses related to environmental investments in the past ten years exceed EUR 2.3 billion.

ENVIRONMENTAL EXPENDITURES voestalpine AG

In millions of euros



Environmental expenditures in the business year 2018/19 have grown to EUR 299.1 million due to the significant increase in costs associated with the EU emissions trading system (EU ETS). Because of the dramatic increase in the price of the CO_2 certificates by 61.7%, the resulting expense (which is recognized in net profit or loss) in the business year 2018/19 for purchasing emissions trading certificates was EUR 69 million and thus EUR 36 million higher year over year.

In the reporting period, EU emissions trading already accounted for fully 23% of the current environmental funds. About 24% of these funds were spent on waste recycling, reuse, and disposal; 34% went toward clean air activities at the operating level; and 16% were spent on measures to protect the aquatic environment.

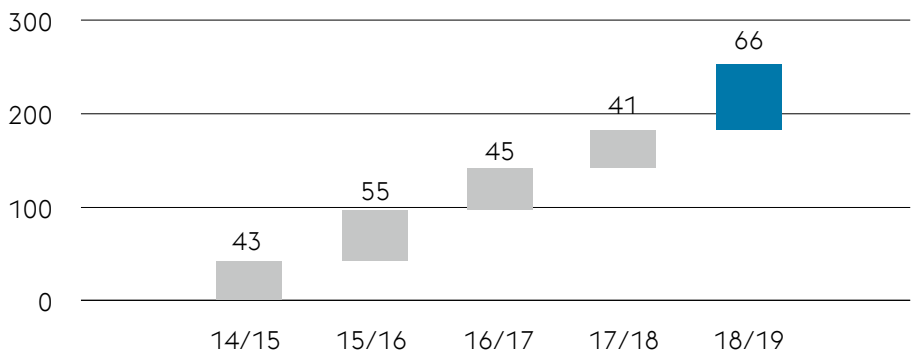
11.3 ENVIRONMENTAL INVESTMENTS

Group-wide, some EUR 400 million were spent in the past ten years on investment projects having a clearly allocable environmental impact.

New environmentally relevant investments rose from EUR 40.7 million in the business year 2017/18 to EUR 66.2 million in the business year 2018/19. This increase stems mainly from two major projects in the Steel Division and the High Performance Metals Division, respectively.

ENVIRONMENTAL INVESTMENTS voestalpine AG

Cumulative, in millions of euros



In the **Steel Division,** Blast Furnace A (the Group's largest individual blast furnace) at the Linz, Austria, site saw a complete overhaul. More efficient filter systems were introduced and extensive supplementary steps were taken to ensure blast furnace gas cleaning and dedusting. The rehabilitation work on the areal of the division's Linz-based coking plant that has been contaminated since World War II has been ongoing since 2011. The work to remove highly contaminated areas in the eastern portion of the areal by way of so-called hot spot excavation continued in the business year 2018/19. Additional investments were made at the Corpus Christi plant in the United States to suppress dust emissions.

The **High Performance Metals Division** has lowered its specific energy consumption by acquiring a new forging press with automated system controls and by putting in place new, energy-efficient furnaces.
In the **Metal Engineering Division,** additional steps have been taken to suppress dust, for instance, by misting the production lines near the blast furnaces in Donawitz, Austria, as well as by installing dust-suction equipment at the annealing furnace in Kindberg, Austria.

The **Metal Forming Division** invested in the expansion of its in-house generation of hydropower and thus the production of renewable energy, which the voestalpine Group has already pursued in the past at several sites. During the reporting period, a more powerful turbine was installed in one of the existent hydroelectric plants, and the power plant on the whole—all the way to its control systems—was brought up to specifications. Steps aimed at using electromobility as the intracompany mode of transportation were accelerated in a number of this division's companies.

11.4 AIR EMISSIONS

Major air pollutants generated in the production of steel are greenhouse gases (in particular CO_2) as well as sulfur dioxide (SO_2), nitrous oxides (NO_X), and dust. voestalpine fully complies with the statutory limits regarding all of these emissions. These parameters are verified and their annual loads determined by means of continuous measurements, periodic analyses, and material flow analyses.

voestalpine endeavors to minimize air pollutants generated during production on account of purely technical processes to the greatest extent possible. For one, this is accomplished by the continuous optimization of technical processes (so-called "process integrated (PI) measures") and, for another, by way of state-of-the-art scrubbing facilities that minimize remaining emissions (so-called "end-of-pipe measures").

Technical limitations make it impossible so far to entirely avoid process-related emissions resulting from required raw materials and existent production processes. We have succeeded in lowering emission levels to the technologically achievable minimum thanks to the environmental measures that were launched as early as in the mid-1980s and have been pursued since then with the help of extensive investments, both technically and financially.

An analysis of the past three decades shows that the specific emissions of the voestalpine Group (i.e., per ton of crude steel) have been reduced as follows: CO_2 by 20%, SO_2 and NO_x by 75% and dust by 95%.

11.4.1 GREENHOUSE GAS EMISSIONS

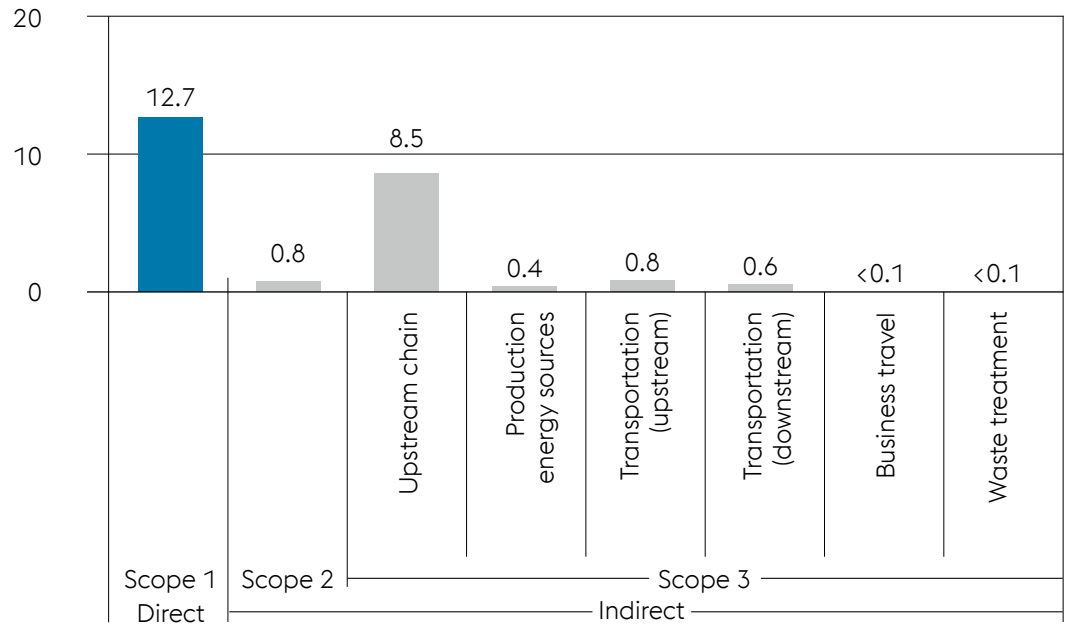
The direct greenhouse gas (GHG) emissions of the approximately 130 production facilities of voestalpine in the calendar year 2018 were 12.7 million tons; the two Austrian plants that produce crude steel (Linz and Donawitz) account for 85% of this amount.

voestalpine places great value on transparency and thus has participated in the Carbon Disclosure Project (CDP) among others since 2017. To this end, the greenhouse gas emissions were tallied and externally verified in comprehensive fashion for all production facilities along the entire value chain in accordance with ISO 14064-3.

In 2018, voestalpine was given the CDP's high "B" rating for its transparency in climate reporting and its activities with respect to both climate protection and climate strategy.

DIRECT AND INDIRECT GHG EMISSIONS

In million tons of CO_2e



11.4.2 SO_2 EMISSIONS

The use of particular raw materials—e.g., coal and coke—introduces sulfur into the production process. In turn, this creates sulfur dioxide (SO_2) during particular processing steps and when by-products (coke oven gas (COG) and blast furnace gas (BFG)) are used for thermal recycling.

The specific SO_2 emissions in the calendar year 2018 were 0.44 kg/t of product, but the absolute SO_2 emissions were lower due to the idling of the plant during the complete overhaul of Blast Furnace A at the Group's Linz site.

SO_2 EMISSIONS

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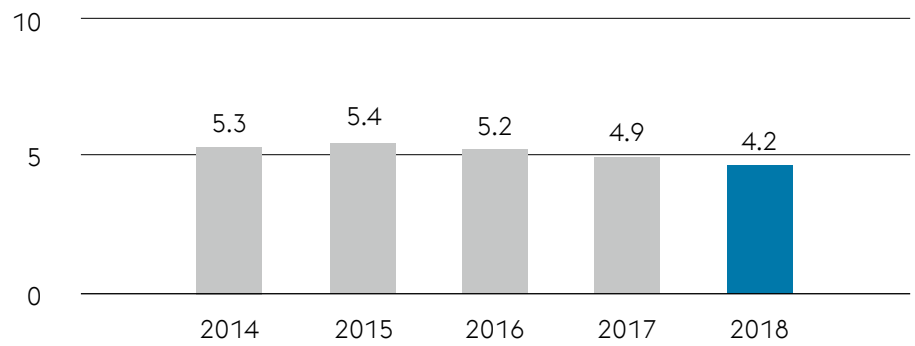
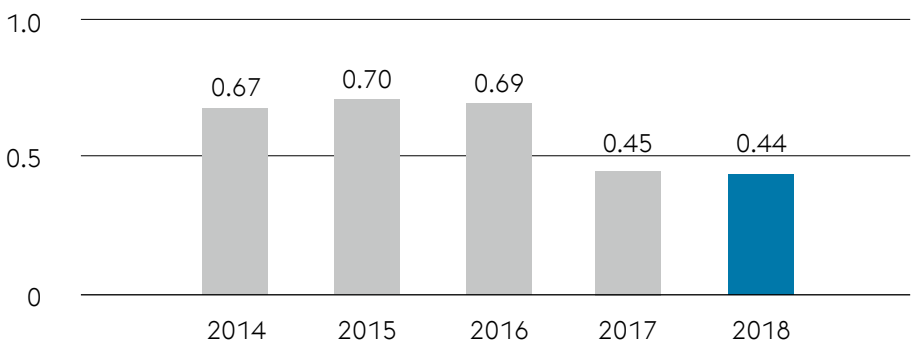


SPECIFIC SO_2 EMISSIONS

kg/t of product



11.4.3 NO_X EMISSIONS

In steel production, nitrogen oxides result from the operation of industrial furnaces and from thermal recycling of the by-product gases. voestalpine's absolute NO_X emissions in the calendar year 2018 were about 4.9 kt, and the specific NO_X emissions were about the same as in the previous year.

NO_x EMISSIONS

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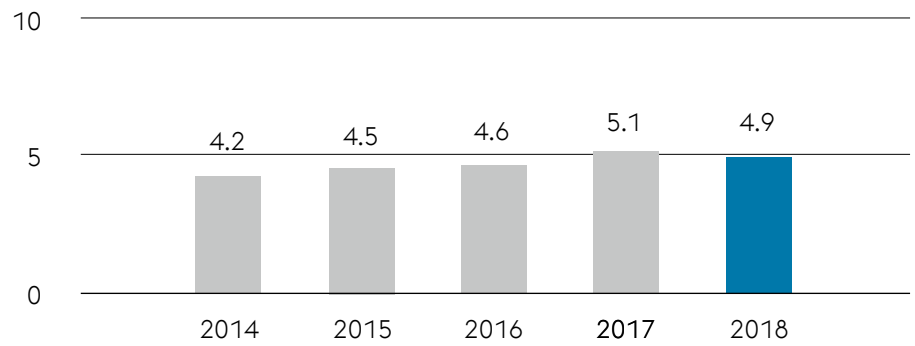
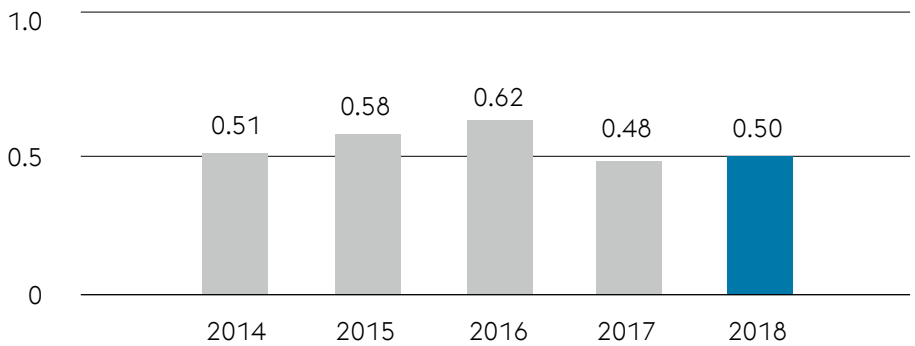


SPECIFIC NO_x EMISSIONS

kg/t of product



11.4.4 CAPTURED DUST EMISSIONS

Dust-laden exhaust air and exhaust gases occurring during production are captured and channeled to dedusting systems using state-of-the-art measures and precautions. While absolute dust emissions rose in 2017 due to the start of full operations at the direct reduction plant in Corpus Christi, Texas, USA, a slight decline was recorded in 2018. At 37 g/t of product, voestalpine's specific dust emissions during the reporting period remained at a very low level.

CAPTURED DUST EMISSIONS

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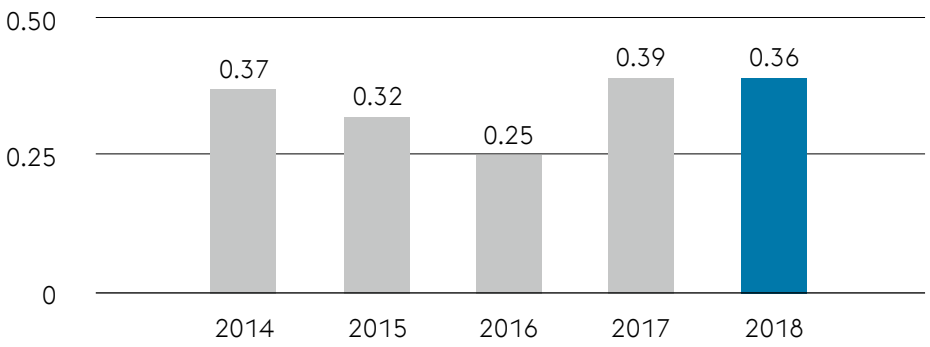
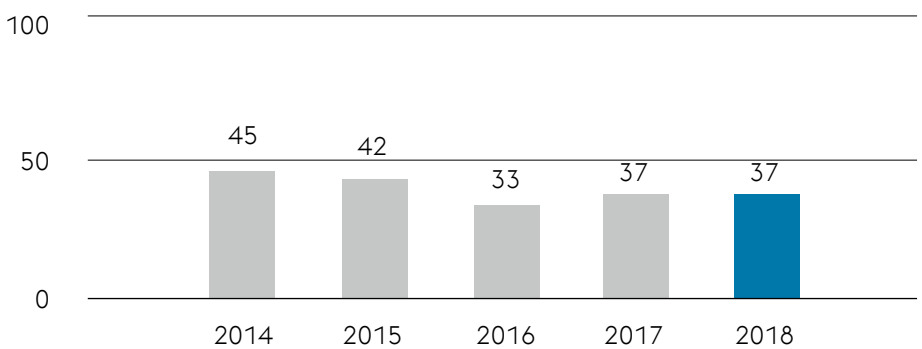


SPECIFIC CAPTURED DUST EMISSIONS

g/t of product



11.4.5 ORGANIC AIR POLLUTANTS

Organic air pollutants (VOC) are primarily process related, resulting from the thermal process stages in crude steel production and/or in the respective combustion processes. Regenerative afterburning was installed at the Linz facility in connection with the drying of coal; 2018 was the first year during which it was in operation throughout.

This made it possible to de facto eliminate VOC emissions from this area of the facility, which had a significant effect on the absolute VOC emissions of the Group on the whole. The specific VOC emissions fell to a new minimum level of 24 g/t of product.

VOC EMISSIONS

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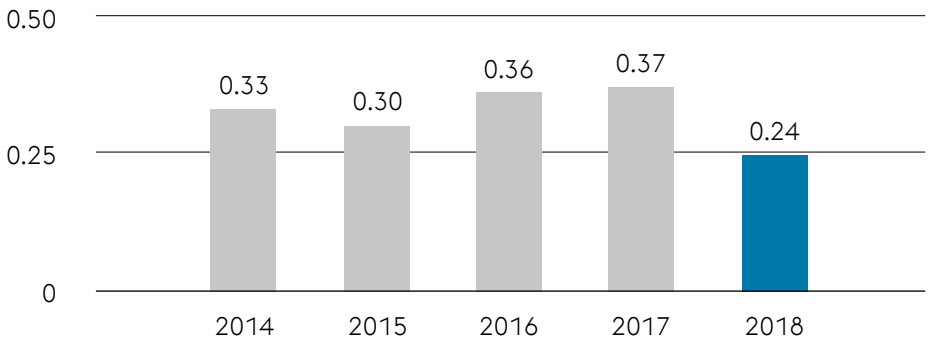
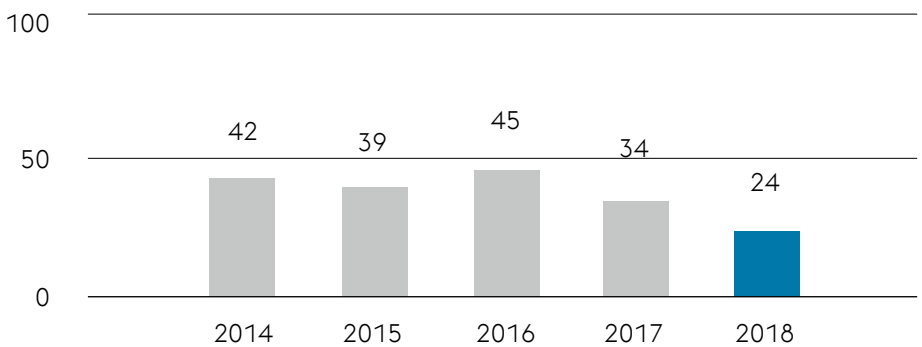


SPECIFIC VOC EMISSIONS

g/t of product



11.5 WATER MANAGEMENT

Water is used in the production of both pig iron and crude steel for cooling and generating steam; it is one of the most important consumables and auxiliary materials. It goes without saying that voestalpine conserves water resources as a matter of course—especially taking the local environment into account. This is achieved by means of circular systems and the repeated use of process water, among other things.

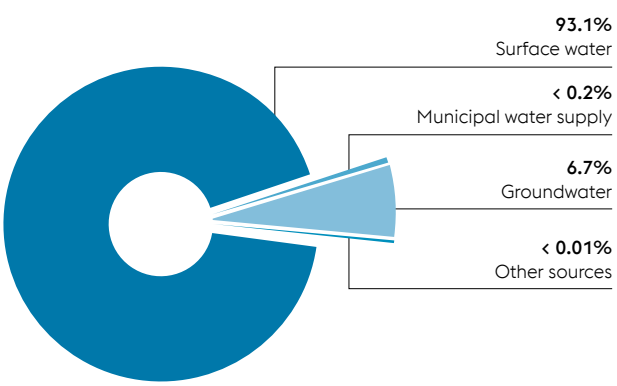
In keeping with ISO 14046, voestalpine applies an integrated life cycle assessment approach to its circular water economy throughout all production steps and locations.

Determining the "blue water consumption" (i.e., the net consumption of freshwater) and the water scarcity footprint of every production facility involves conducting a detailed analysis of the ways they contribute to the water scarcity of a region, taking local hydrogeological conditions into account.

voestalpine used approximately 687 million m^3 of water in the calendar year 2018, but some 93% of this amount was used solely for cooling purposes. The water was sourced from surface water and returned to the source in the same quality. Accordingly, the company's direct blue water consumption in the calendar year 2018 was 12.7 million m^3 or 1.32 m^3/t of product. Upstream steel production accounted for most of the indirect blue water consumption of 48.6 million m^3 or 5.03 m^3/t of product.

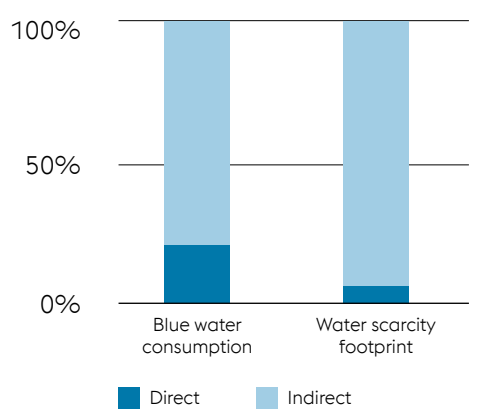
The impact of voestalpine's process plants on local water systems thus is relatively low and does not aggravate conditions in regions already affected by water scarcity. There are the findings of an externally verified study on the determination of the water scarcity footprint in 2018, which plotted a Group-wide analysis of the production activities along the entire value chain (i.e., from cradle to gate).

WATER EXTRACTION 2018



WATER FOOTPRINT voestalpine AG

In %



11.6 WASTE AND RECYCLING MANAGEMENT

In addition to conserving resources in both production and processing, voestalpine also focuses on improving the useful life of its products as well as their reusability and recoverability. voestalpine endeavors to achieve the most complete possible circular economy, even with respect to by-products resulting from production as well as residual products and waste.

Steel is considered a permanent material, i.e., a raw material that may be recycled any number of times without any loss in quality. The steel mills of the High Performance Metals Division operate electric furnaces and produce highest-grade steel products from own and third-party scrap as well as alloy additives. In 2018, the recycling rate of iron relative to the product output at voestalpine's crude steel production plants in Linz and Donawitz was 30.0%*.

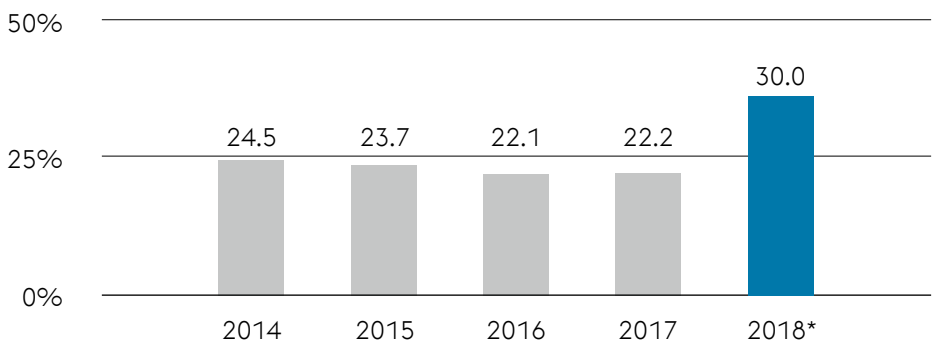
Process management in the integrated steel mills is optimized on an ongoing basis to ensure a high degree of internal recycling and external utilization of residual products and waste from both the production machinery and the downstream machinery (e.g., filter dust and mill scale). Furthermore, products, residual materials, and waste that accumulate externally are also utilized in voestalpine's production plants—scrap, in particular, but also plastic pellets as well as waste oil and used grease.

Due to their ingredients, many of the by-products generated in the production and downstream processing of pig iron and steel can be utilized as recycled materials in-house or as secondary raw materials in other industries (e.g., steel mill dust in the zinc industry or slag in the cement industry).

The specific volume of non-hazardous waste in 2018 was 132 kg/t of product. As in the previous year, the specific volume of hazardous waste was 22 kg/t of product.

RECYCLING RATE

In %



* From 2018: recycling rate of iron relative to product output
(= percentage of iron in the product made of secondary raw materials such as scrap)

WASTE VOLUME

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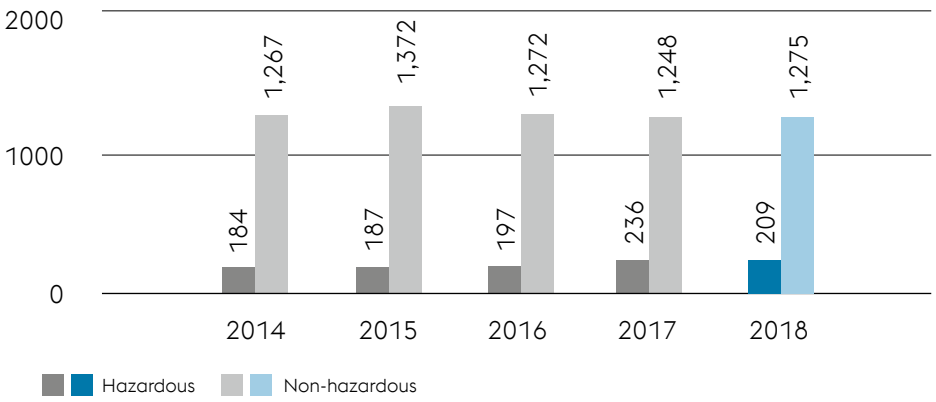
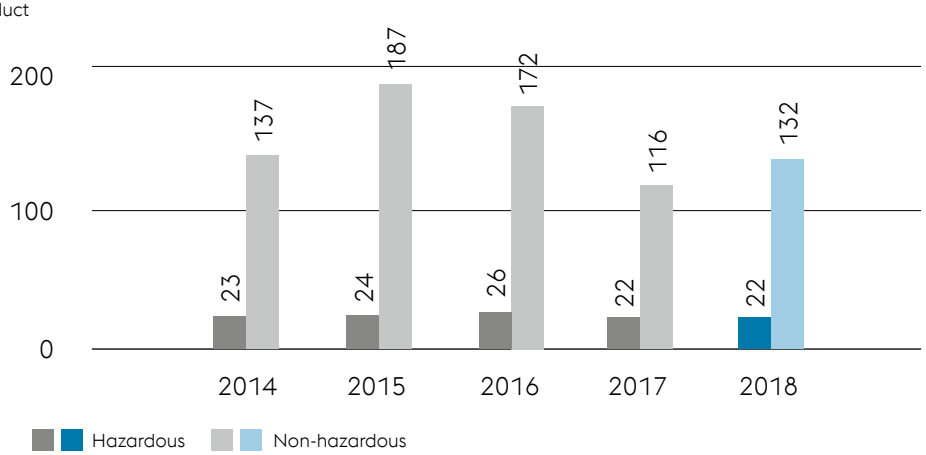


SPECIFIC WASTE VOLUME

kg/t of product



11.7 ENERGY

Because it is both an environmental and a cost factor, the consumption of energy is a material parameter in steel production. Activities aimed at the efficient use of energy thus have a long tradition at voestalpine. In conventional, integrated steel mills, efficiency gains are achieved through the continual optimization of process gas recycling, the use of waste heat potentials, and comprehensive energy management systems.

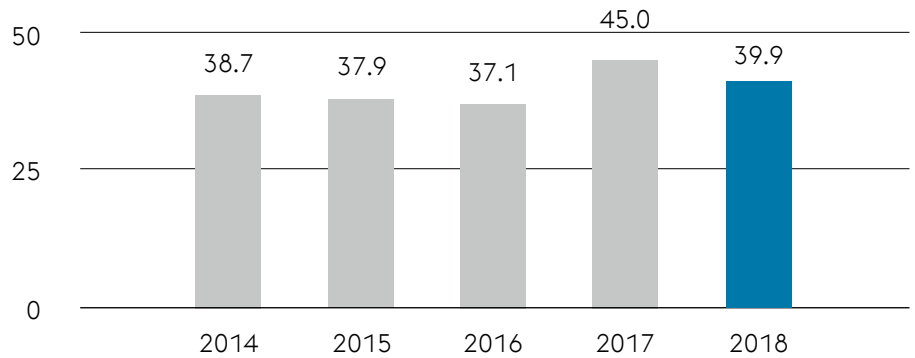
The total energy consumption of the voestalpine Group in the calendar year 2018 was 39.9 TWh (4.1 MWh/t of product), with Linz and Donawitz (the two facilities producing crude steel) as well as the newly built direct reduction plant in the United States recording the highest energy consumption by far.

Due to the extended operational shutdown during the complete overhaul of the Group's largest individual blast furnace (Blast Furnace A) in Linz, Austria, total energy consumption in absolute terms declined in 2018, but specific consumption remained largely unchanged year over year.

Coal (47.2%), coke (14.4%), and natural gas (31.1%) are the sources of energy that account for the lion's share of the energy consumed. By-product gases resulting from processes are fully reused in the steelmaking facilities' own power plants, with the result that their power needs are covered almost entirely through the in-house generation of electricity. Externally sourced electricity accounts for a mere 6.4% of total energy consumption.

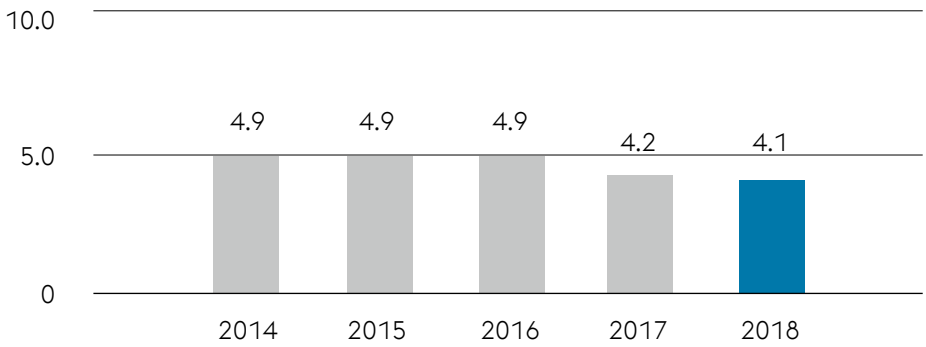
TOTAL ENERGY CONSUMPTION

TWh

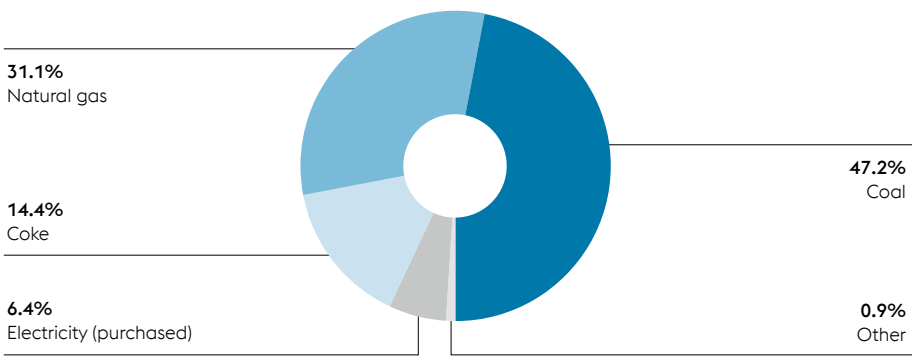


SPECIFIC TOTAL ENERGY CONSUMPTION

MWh/t of product



PERCENTAGE OF ENERGY SOURCES 2018



11.8 BIODIVERSITY

voestalpine treats all local ecosystems at its production facilities responsibly and contributes actively to the maintenance of biodiversity.

For example, some 20,000 m^2 of flower pastures were created in Linz, the Group's largest production site. The resulting wildflower pasture provides an additional source of food for many types of insects—especially bees. "Insect hotels" also provide breeding spaces for rare species. A project for establishing and managing several bee colonies at the site is currently being implemented; voestalpine employees with many years of beekeeping experience take care of them.