

13. ENVIRONMENT

Environmentally conscious action is firmly integrated into the voestalpine Group's corporate philosophy. Hence the company endeavors not only to use resources such as raw materials and energy economically along the entire production chain but also to mitigate the environmental impact of processes and products.

To achieve these goals, voestalpine utilizes the best available technologies in its production plants and continually works to boost efficiency, lower emissions, and reduce the consumption of energy subject to the parameters of the existing steel production processes. Our intensive work to research new, more environmentally friendly production processes and, not least, to refine materials and products alike makes decisive contributions to the company's environmental footprint as well.

All of these activities are supported by transparent and efficient environmental management systems (EMSs) that have already been implemented more or less across the entire voestalpine Group.

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

- >> Take comprehensive responsibility for products
- >> Optimize the production processes
- >> Establish environmental management systems
- >> Integrate employees into these processes and ensure environmentally-conscious conduct
- >> Engage in open and professional dialogues



Environmental protection is a core component of voestalpine’s Sustainability Strategy. It encompasses the following principles:

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 based on the principle that the best available technologies must be applied as appropriate and in economically viable fashion. We also develop new approaches that aim to mitigate environmentally relevant effects on the air, soil, and water as best as possible.

Circular Economy and Life Cycle Assessments (LCAs)

We support holistic, comprehensive, and integrated analyses and assessments of materials (LCAs) as well as of all process and value chains within the parameters of the circular economy, also known as “circularity.”

Energy and Climate Policy— Commit to low-carbon production

We commit to achieving net-zero emissions in production, especially through comprehensive research and development of new technologies via cross-sector cooperation agreements and projects. We support the transformation toward a largely fossil-fuel-free society thanks also to our product innovations that are used, for example, in e-mobility, railway systems, and renewable energy generation. We also engage in an open and constructive dialogue with stakeholders such as political decision makers, advocacy and interest groups, civil society as well as the scientific community and environmental organizations.



13.1 ENVIRONMENTAL MANAGEMENT SYSTEMS

Worldwide, about 120 production companies and facilities are a part of voestalpine’s environmental data management system. This includes all steel producing and processing (and therefore all energy and emissions-intensive) business segments that are relevant to the Group’s carbon footprint.

The Group periodically compiles about 150 key figures, for instance, those related to air emissions; energy and materials efficiency; water, waste, and recycling management; as well as environmentally relevant investments and expenditures. These data are used for external reporting and fulfillment of reporting obligations as well as, in particular, for environmental as-

essments of processes, products, and materials. Moreover, the metrics compiled as part of environmental data management provide the basis for strategic planning and operational implementation of environmental activities.

The voestalpine Group has established management systems across the board worldwide. Fully 76% of its production plants, which account for 96% of the Group’s entire production volume, have implemented an environmental management system pursuant to ISO 14001 or the EU’s Eco-Management and Audit Scheme (EMAS). Of these entities, 28% are subject to certified energy management pursuant to ISO 50001.

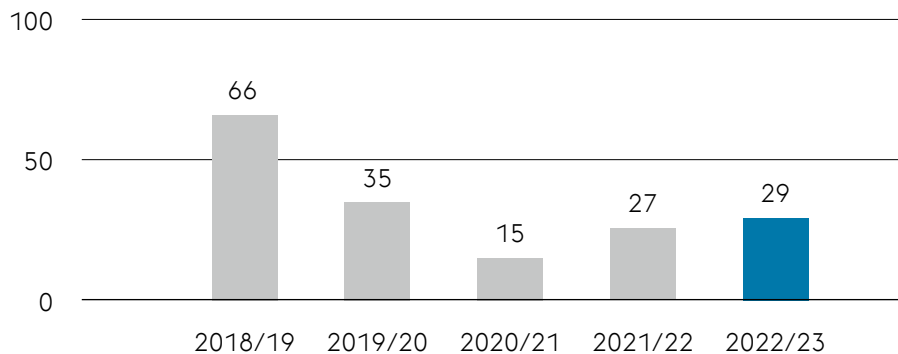
13.2 ENVIRONMENTAL INVESTMENTS

In the business year 2022/23, investments in environmentally relevant facilities stood at EUR 28.9 million, thus slightly exceeding the previous business year's level (EUR 26.7 million). These in-

vestments served primarily to expand captive renewable energy production, boost energy efficiency, and further reduce emissions.

ENVIRONMENTAL INVESTMENTS

In millions of euros



As early as in the business year 2021/22, voestalpine launched a Group-wide campaign to expand its own production of renewable energy. For one, this entails the installation of PV units on technically suitable building roofs and open areas; for another, the Group invests in both wind and hydropower facilities. The company also continues to push the installation of electric charging stations at its European locations.

Over and above the pronounced expansion of captive renewable energy generation, reductions in energy consumption are at the center of the divisions' environmental projects. The High Performance Metals Division continually works to implement projects aimed at boosting energy efficiency. Just as the Group's other divisions, it is also taking steps to lower the share of fossil fuels. The division's Swedish plant, for example, substituted biogas for 30% of its total natural gas consumption and converted equipment such as furnaces from natural gas to electrici-

ty. In doing so, voestalpine is consistently pursuing its ambitious goal to bring about an 80% reduction in CO₂ emissions at its Swedish plant by 2027/28. The division's Brazilian entity also implemented important energy efficiency measures in connection with smelting and forging as well as the electric furnace in the business year ended.

It goes without saying that it is more difficult to raise remaining energy efficiency potential at the "conventional" crude steel production facilities. At the Donawitz (Austria) steel plant of the Metal Engineering Division, improvements in heat recovery will boost energy savings by 1,700 MWh annually. The optimized use of waste heat in the facility's captive power plant and the resulting improvement in efficiency adds another 2,000 MWh of energy savings per annum. Many other steps have been taken to significantly boost the plant's ability to generate renewable electricity from its own sources. For example, a PV system with an output of 1.36 MWp was

installed in an external landfill; it has been feeding green electricity into the plant's grid through a direct transmission line since October 2022. In the future, these 2,520 modules are forecast to deliver some 1.5 million kWh of solar electricity per year with the help of ten inverters for the production and processing companies at the Donawitz plant.

Furthermore, a PV system with an installed total output of 8 MWp was set up on the factory floor roof of the Metal Engineering Division's seamless tube rolling mill in Kindberg, Austria; yet more units are planned for other factory buildings. As in other divisions too, operational and/or process-related steps have been taken to replace natural gas with electricity.

PV units were installed at various locations of the Metal Forming Division—especially in Austria, Germany, and the Netherlands—often using internally produced “iFix” type mounting systems.

Besides carrying out the preparatory work for the greentec steel program described in the “Climate Action” chapter, the Steel Division focused on energy efficiency, captive generation of renewable energy using expanded photovoltaics units as well as increases in the share of e-mobility for both intra-plant vehicular traffic and the charging infrastructure used by voestalpine's employees.

The continued expansion of the division's CO₂-reduced product portfolio was one important focal point. voestalpine already started back in calendar year 2021 to offer all flat steel and heavy plate products manufactured at the Linz (Austria) plant in a greentec steel edition also. The CO₂ footprint of these products has been lowered by some 10% thanks to the optimization of operating modes (for example, when scrap and reducing agents are utilized) and the use of renewable electricity. In addition to the automotive industry, steel produced in this manner is already being deployed by customers in facade construction, building technology, crane construction, or the heating and heat pump industry.

Austria's largest legacy pollution clean-up project—“Altlast O76, Linz Coking Plant”—which was launched in calendar year 2012 was finally completed in the business year 2022/23.

13.3 ENVIRONMENTAL EXPENDITURES

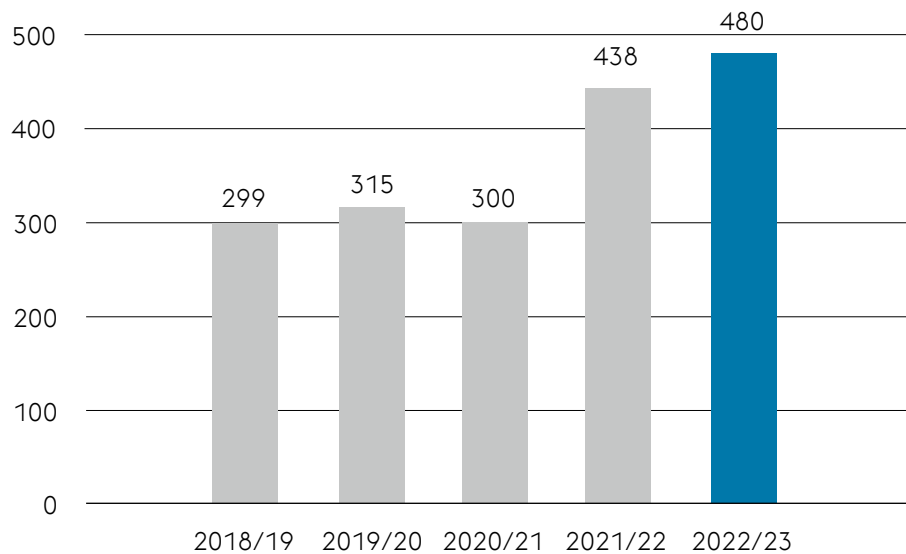
The environmental expenditures of the voestalpine Group reached yet another all-time high in the business year 2022/23, rising 9.7% to EUR 479.9 million. voestalpine's environmental expenditures over the past ten business years thus already come to EUR 3 billion.

The investments were directed primarily at the following main areas during the business year ended:

- >> 69% were invested in clean air activities including EU emissions trading allowances (also see the "Climate Action" chapter)
- >> 17% were invested in waste recycling, reuse, and disposal
- >> 13% were spent on measures to protect the aquatic environment
- >> 1% was spent on noise abatement and other projects

ENVIRONMENTAL EXPENDITURES

In millions of euros



13.4 AIR EMISSIONS

Due to both processes and raw materials, conventional production of pig iron and steel generates various emissions such as carbon dioxide (CO₂), but also sulfur dioxide (SO₂) and nitrogen oxides (NO_x).

voestalpine fully complies with the relevant statutory thresholds. These parameters are verified and the annual loads determined by means of continuous measurements, periodic tests, and material flow analyses. State-of-the-art scrubbing facilities (i.e., end-of-pipe measures) are utilized in addition to continual process optimization (i.e., process integrated (PI) measures) to minimize any remaining emissions.

Over the last few decades, the voestalpine Group substantially lowered its emissions thanks to extensive environmental measures and innovations in process technology. Given existent steel production technologies, the residual air emissions are the minimum achievable.

13.4.1 GREENHOUSE GAS EMISSIONS

The direct greenhouse gas (GHG) emissions (Scope 1) of the voestalpine Group's roughly 120 production facilities declined in calendar year 2022 from 14.5 million tons to 12.7 million tons of CO₂ equivalents. This is due, for one, to the sale of voestalpine Texas LLC (which was a primary source of GHG emissions) and, for another, to the downturn in production.

Both the Linz plant (8.9 million tons) and the Donawitz plant (2.9 million tons) in Austria account for most of the Group's direct GHG emissions because they produce crude steel via the blast furnace route.

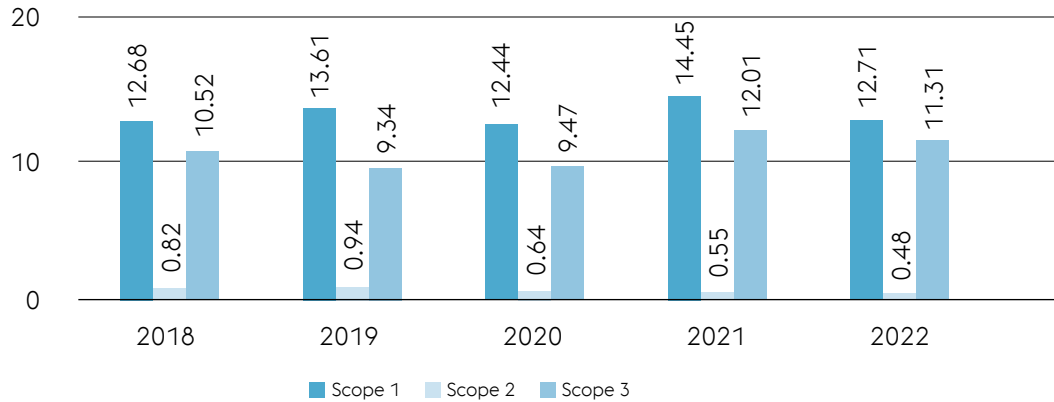
In addition to the direct emissions (Scope 1), we also collected data on the indirect greenhouse gas emissions (Scope 2 and Scope 3) and analyzed the data using the "EF 3.0 Climate Change total" method. To determine indirect GHG emis-

sions, voestalpine avails itself only of verified data sets and emissions factors from known sources (sphera GaBi TS®) and primary data from suppliers. Besides carbon dioxide, the direct and indirect emissions data also include the greenhouse gases methane and nitrous oxide.

The observation period used for greenhouse gas accounting is to be expanded in the future, as follows: All voestalpine Group companies that engage primarily in downstream materials processing and thus have a significant impact on the Scope 3 emissions will have to be taken into account as well. Initial analyses to this end were already carried out during the reporting period. Quantification and systematic analyses are planned for the next reporting period.

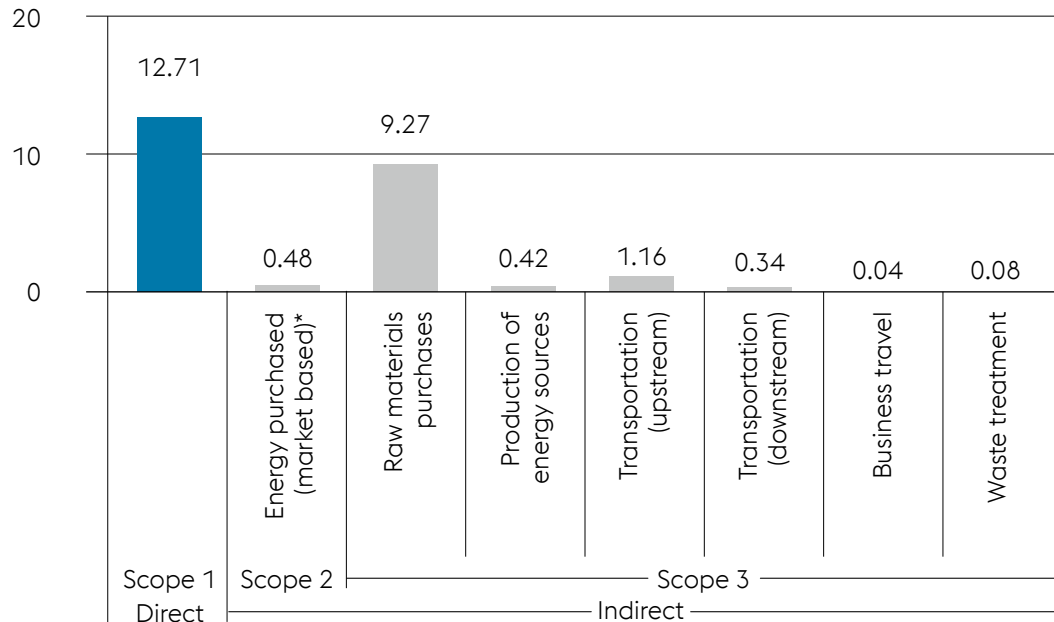
DEVELOPMENT OF SCOPE 1, 2, 3 EMISSIONS

In million tons of CO₂e



DIRECT AND INDIRECT GREENHOUSE GAS EMISSIONS 2022

In million tons of CO₂e



* Scope 2 market based: 0.48 million tons of CO₂e
 Scope 2 facility based: 0.65 million tons of CO₂e

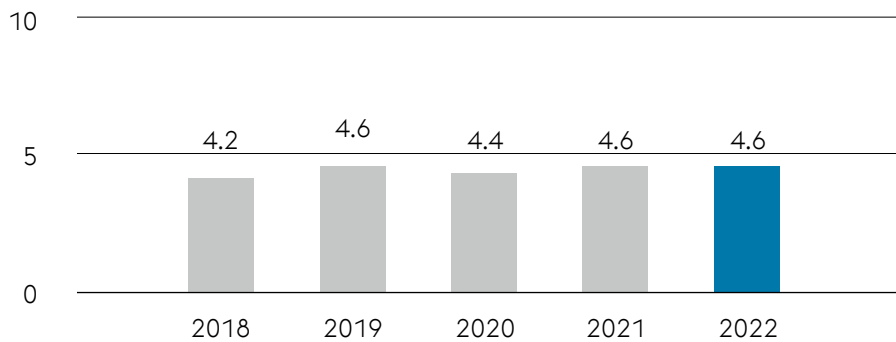
13.4.2 SO₂ EMISSIONS

The use of particular raw materials—especially coal and coke—introduces sulfur into the production process. Additional processing steps and the use of by-products such as coke oven gas (COG) and blast furnace gas (BFG) for thermal recycling turn sulfur into sulfur dioxide.

The specific SO₂ emissions in calendar year 2022 were 0.54 kg/t of product and thus exceeded the previous year’s metric of 0.44 kg. This increase arises from the change in the production volume owing to the elimination of voestalpine Texas LLC. In absolute terms, the SO₂ emissions remained constant at 4.6 kt.

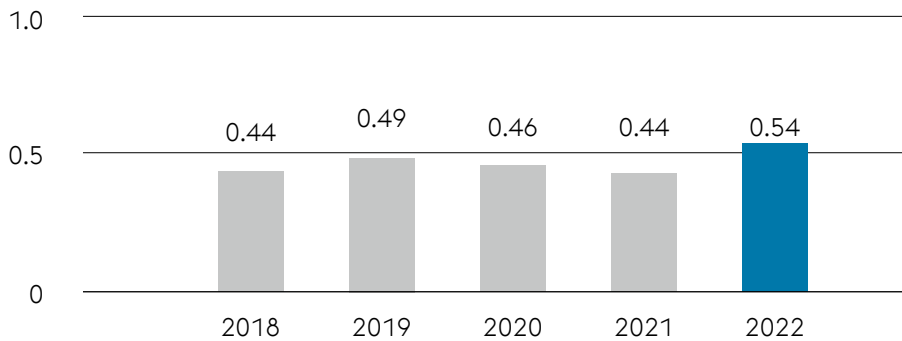
SO₂ EMISSIONS

kt



SPECIFIC SO₂ EMISSIONS

kg/t product



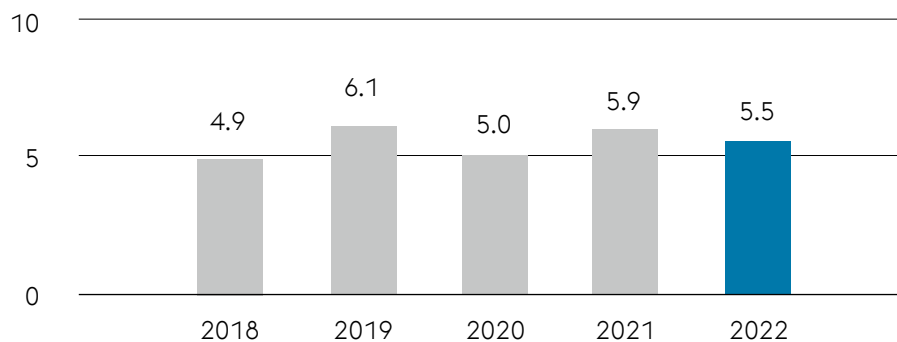
13.4.3 NO_x EMISSIONS

Nitrogen oxides are generated through the operation of industrial furnaces and the thermal recycling of by-product gases.

In calendar year 2022, voestalpine's absolute NO_x emissions fell from 5.9 kt to 5.5 kt. The specific NO_x emissions per ton of product were 0.64 kg (calendar year 2021: 0.55 kg).

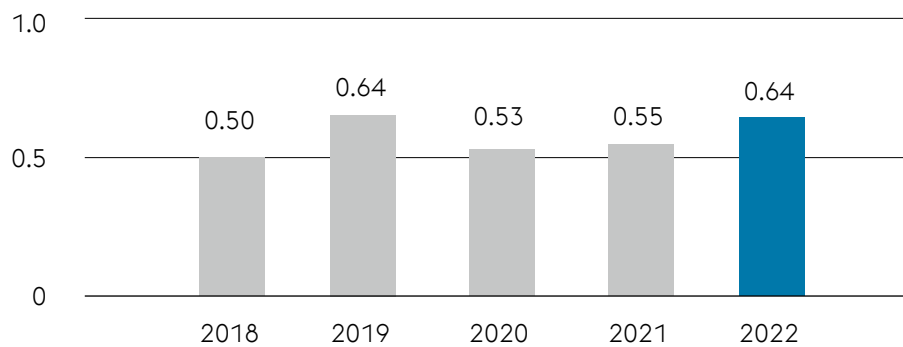
NO_x EMISSIONS

kt



SPECIFIC NO_x EMISSIONS

kg/t product



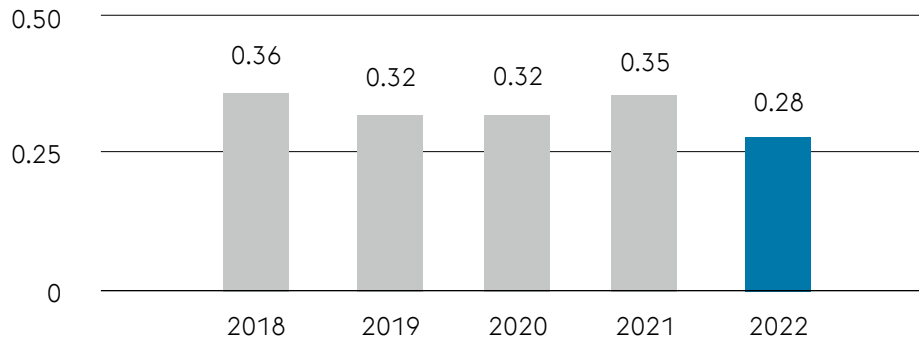
13.4.4 CAPTURED DUST EMISSIONS

Dust-laden exhaust air and exhaust gases that occur during production are captured and channeled to dedusting systems using state-of-the-art processes and equipment.

In absolute terms, captured dust emissions fell in calendar year 2022 to 0.28 kt. In specific terms, the value remained constant at 33 g per ton of product and hence low.

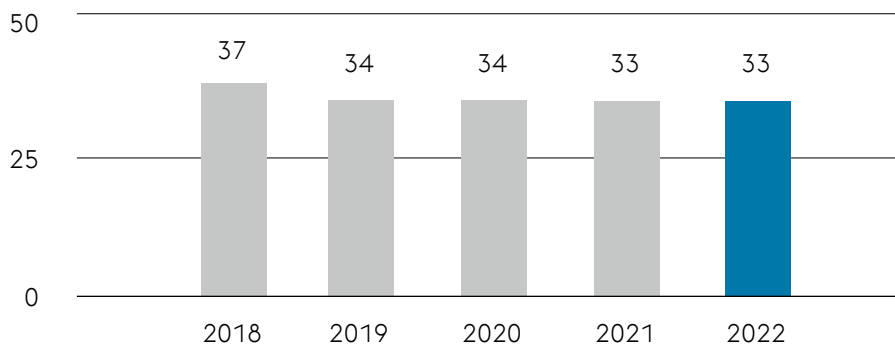
CAPTURED DUST EMISSIONS

kt



SPECIFIC CAPTURED DUST EMISSIONS

g/t of product



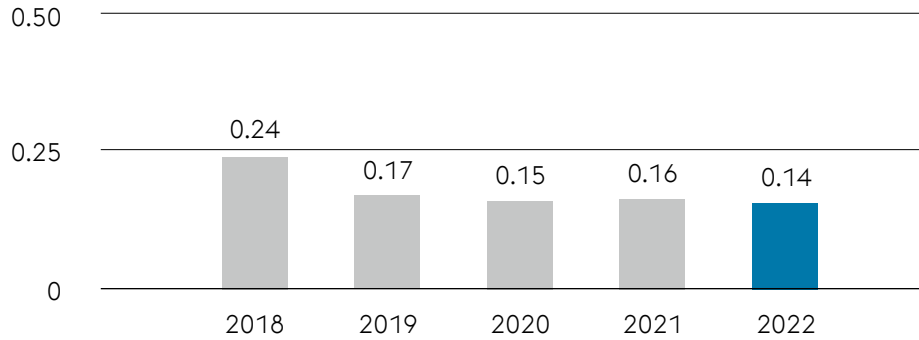
13.4.5 ORGANIC AIR POLLUTANTS

Organic air pollutants (i.e., volatile organic compounds, VOC) are generated primarily during the thermal process stages of crude steel production as well as during the associated combustion processes.

voestalpine commissioned several technically sophisticated pieces of equipment in recent years to cut VOC emissions. This made it possible to bring about a substantial decline in the emission of organic air pollutants. In calendar year 2022, absolute VOC emissions were 0.14 kt (2021: 0.16 kt), and specific emissions were 17 g (2021: 15 g) per ton of product.

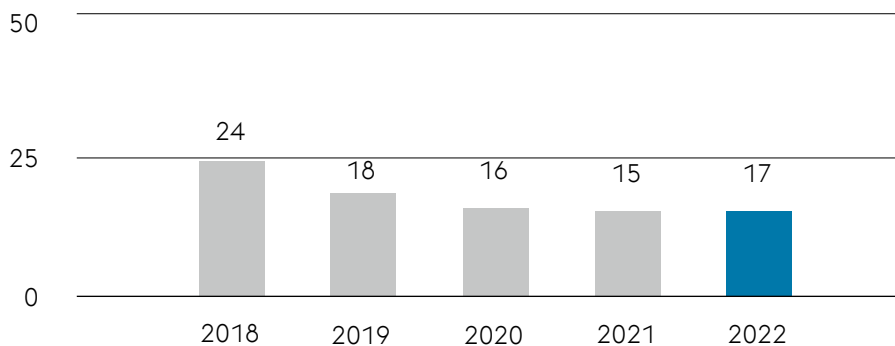
VOC EMISSIONS

kt



SPECIFIC VOC EMISSIONS

g/t product



13.5 WATER MANAGEMENT

Water serves to cool equipment and to generate steam that is used to produce energy and thus is an important consumable and auxiliary material in the entire production and processing cycle.

voestalpine uses water resources as sparingly as possible thanks to circular systems and the repeated utilization of process water. In keeping with ISO 14046 and the LCA approach, comprehensive assessments of the water circulation systems are performed across all production steps and sites.

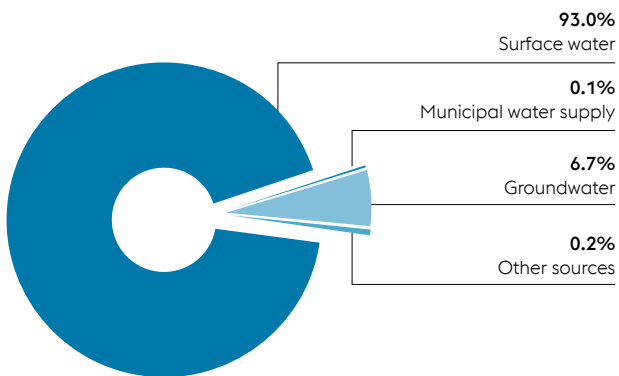
The amount of water used rose from 722 million m³ in calendar year 2021 to 741 million m³ in calendar year 2022. Most of it (93%) was sourced from surface water for cooling purposes and returned back to the source in the same quality.

More than 95% of the cooling and wastewater discharge streams of voestalpine Group companies were subjected to both quantitative and qualitative parameter monitoring. This periodic and continuous monitoring ensures compliance with applicable national and regional standards.

The direct net consumption of freshwater fell from 14.0 million m³ to 11.4 million m³, which equates to an unchanged 1.32 m³ per ton of product. In calendar year 2022, upstream steel production accounted for most of the indirect consumption of 43.6 million m³ (2021: 53.4 million m³) in absolute terms and 5.03 m³ unchanged per ton of product.

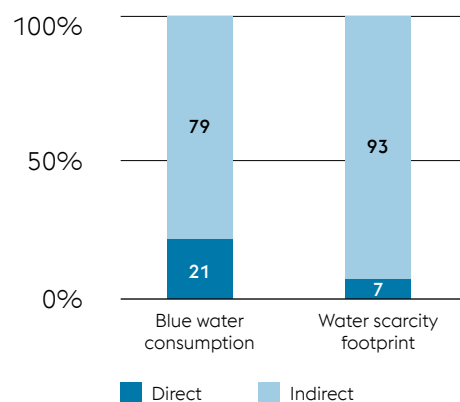
voestalpine's water consumption in production and processing has but minor effects on local water systems and does not aggravate conditions in regions already affected by water scarcity. This is the finding of an externally verified study that determined the water scarcity footprint based on an analysis of all production activities across the entire value chain ("cradle to gate"). Determining the "blue water consumption" (i.e., the net consumption of freshwater) and/or the water scarcity footprint of each and every production facility involves analyzing the ways they contribute to the given region's water scarcity in detail, also taking local hydrogeological conditions into account.

WATER EXTRACTION 2022



WATER FOOTPRINT 2022

In %



13.6 WASTE & RECYCLING MANAGEMENT

Steel is considered a permanent material thanks to its longevity, ease of repairability, and the possibility of converting it as scrap any number of times into new steel products. As such, steel can already make an important contribution to the circular economy that the European Union aims to achieve by 2050.

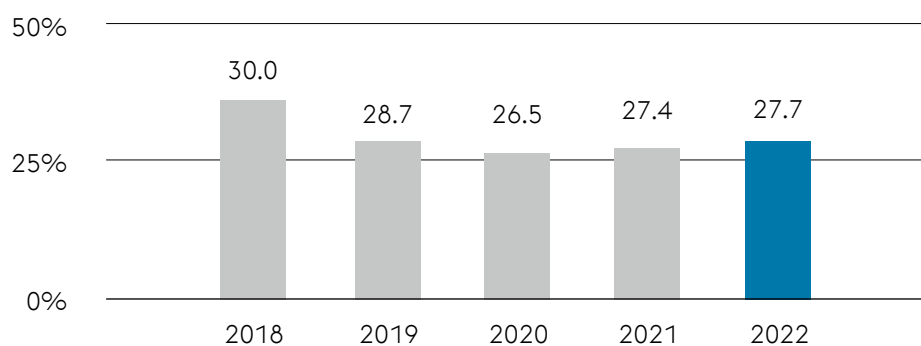
Decoupling the economy from the consumption of resources requires both extending the useful life of products and repurposing them in different ways at the end of their service life. voestalpine is responding to this challenge. Hence own and third-party scrap have become a primary raw material for the Group, for one, in connection with conventional technology, where scrap is used especially in the Linz and Donawitz steel plants and, for another, in connection with the envisioned shift to electric furnaces at these two facilities (also see the “Climate Action” chapter).

Furthermore, scrap is already being used to manufacture special steel grades in the electric furnaces of the High Performance Metals Division.

In calendar year 2022, the recycling rate relative to product output was 27.7% (2021: 27.4%). This metric concerns the product’s iron content that is derived from secondary raw materials such as scrap iron.

RECYCLING RATE

In percent of product output



voestalpine implements numerous measures to promote internal circularity as well as external utilization of residual products and waste from both the production plants and downstream facilities. For one, process management in the integrated steel mills is subject to continual improvement. For another, internally and externally generated products as well as residual products and waste such as scrap and plastic are re(used) in the production plants.

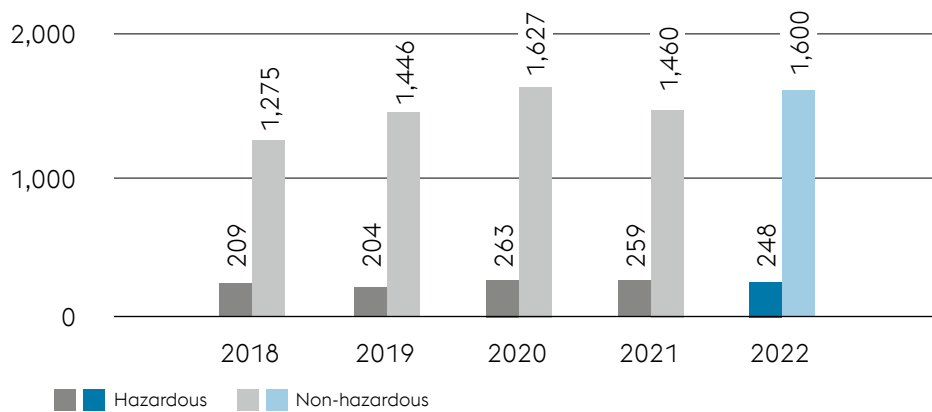
By-products such as steel mill dust or slag are utilized in the zinc industry or in the production of cement.

Agreements with third parties serve to ensure professional and state-of-the-art downstream processing in connection with the transfer of waste to them. Both the monitoring of, and accounting for, these waste streams conform to statutory requirements and are carried out electronically.

The specific volume of hazardous waste in calendar year 2022 was 29 kg per ton of product (2021: 24 kg/t), and that of non-hazardous waste 184 kg per ton of product (2021: 138 kg/t). Greater quantities of waste resulting from refitting and demolition work led to these increases.

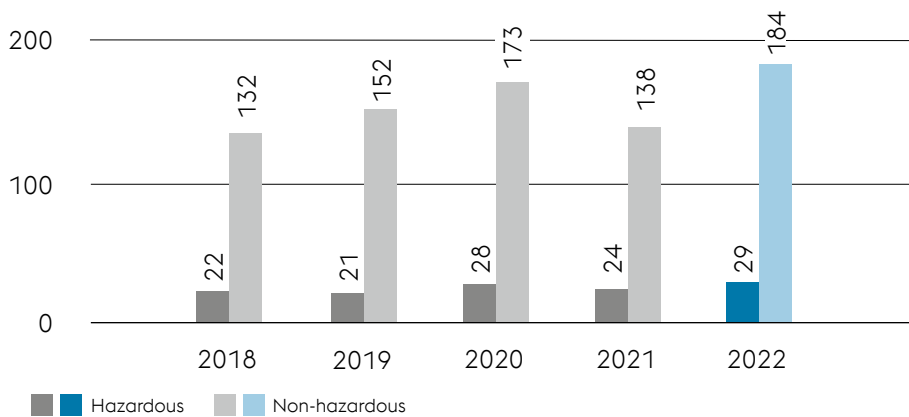
WASTE VOLUME

kt



SPECIFIC WASTE VOLUME

kg/t product

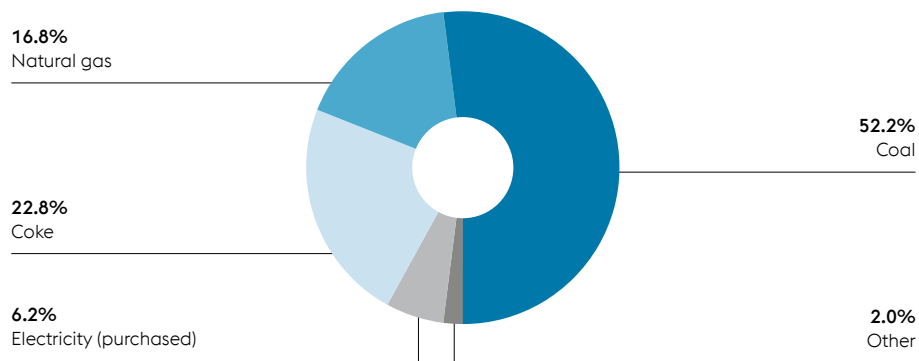


13.7 ENERGY

As already presented in detail in previous reports, the currently still prevailing blast furnace route is based on a mixture of fuels and raw materials-both from fossil sources. Most of this energy is converted: For example, voestalpine generates electricity in its captive power plants from process gases and uses it to drive both the production process and the downstream processing steps. The Group thus can largely cover its need for electric power through captive generation.

Merely 6.2% of the Group's current total energy consumption is procured from the power grid. The remainder is obtained through the conversion of coal (52.2%), the resulting coke (22.8%), and natural gas (16.8%).

PERCENTAGE OF ENERGY SOURCES 2022

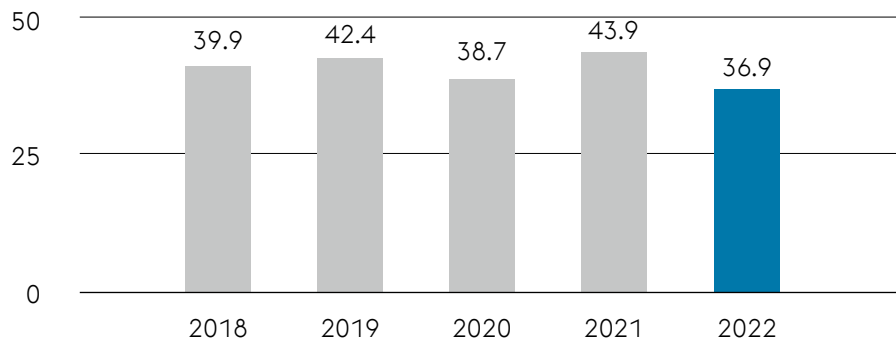


The voestalpine Group's total energy consumption in calendar year 2022 fell from 43.9 TWh to 36.9 TWh. This reduction stems in part from a downturn in production, from the present energy crisis, as well from the partial sale of voestalpine Texas LLC.

Analyzed in specific terms, the Group's energy consumption remained more or less the same as in calendar year 2021, namely, at 4.3 MWh per ton of product. As previously, the steel production plants in Linz (25.2 TWh) and Donawitz (6.3 TWh) were the largest consumers in calendar year 2022 too.

TOTAL ENERGY CONSUMPTION

TWh



SPECIFIC TOTAL ENERGY CONSUMPTION

MWh/t of product

