

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.

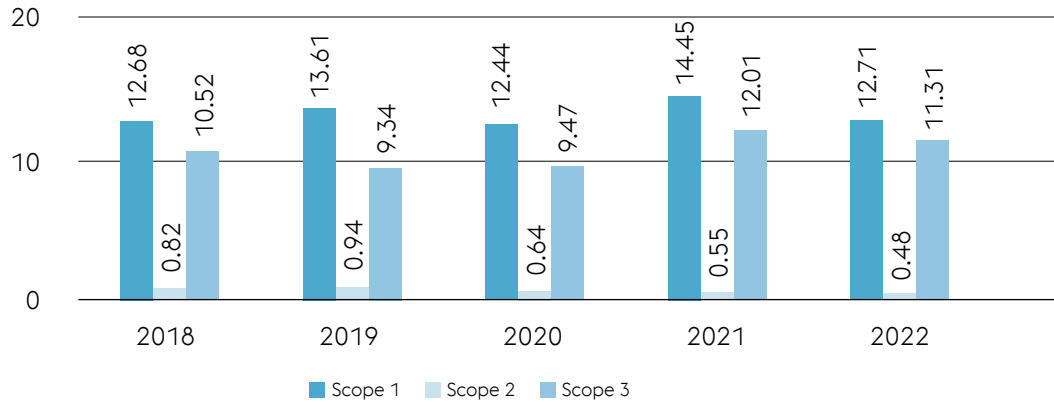
In addition to the direct emissions (Scope 1), we also collected data on the indirect greenhouse gas emissions (Scope 2 and Scope 3) and analyzed the data using the "EF 3.0 Climate Change total" method. To determine indirect GHG emis-

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.

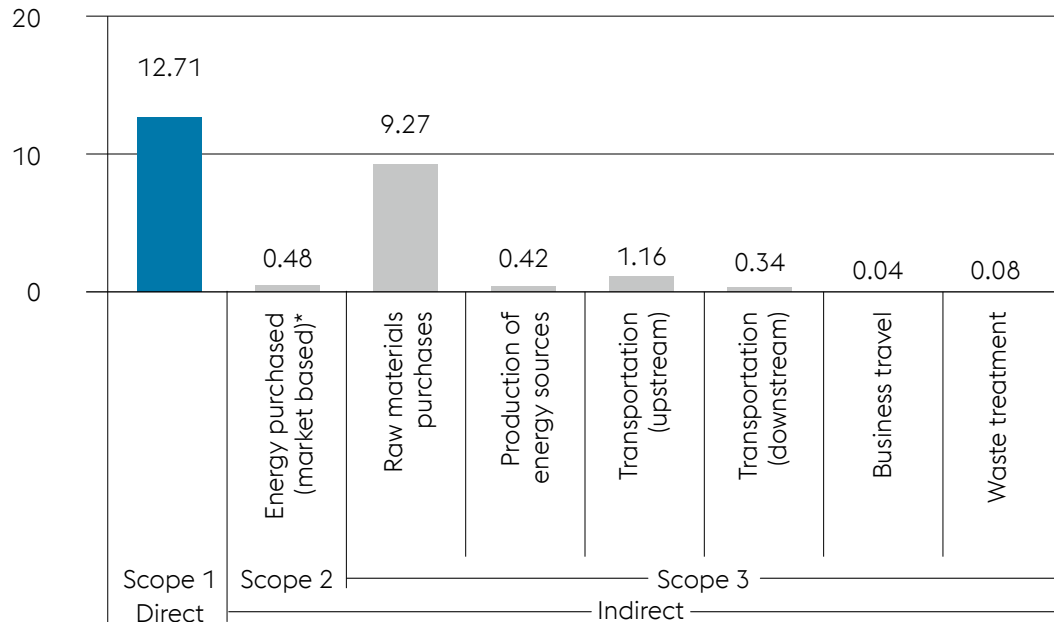
DEVELOPMENT OF SCOPE 1, 2, 3 EMISSIONS

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

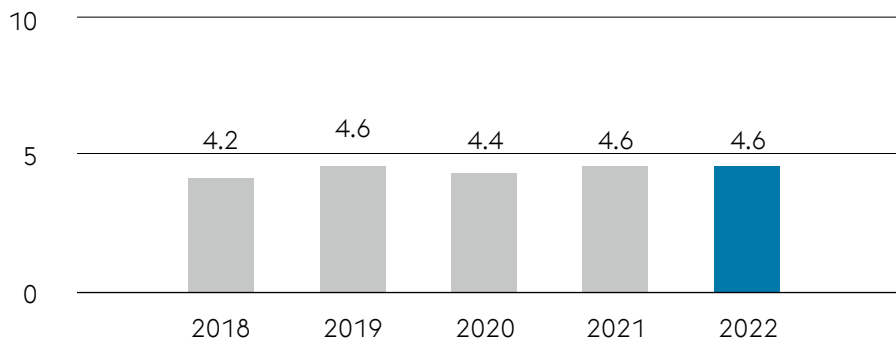
13.4.2 SO₂ EMISSIONS

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.

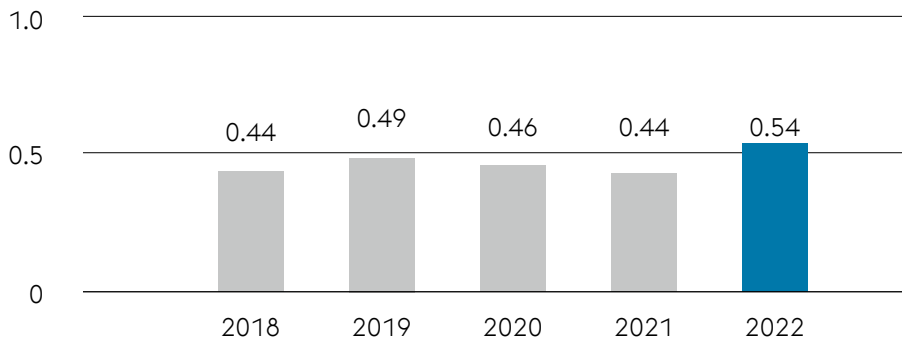
SO₂ EMISSIONS

kt



SPECIFIC SO₂ EMISSIONS

kg/t product



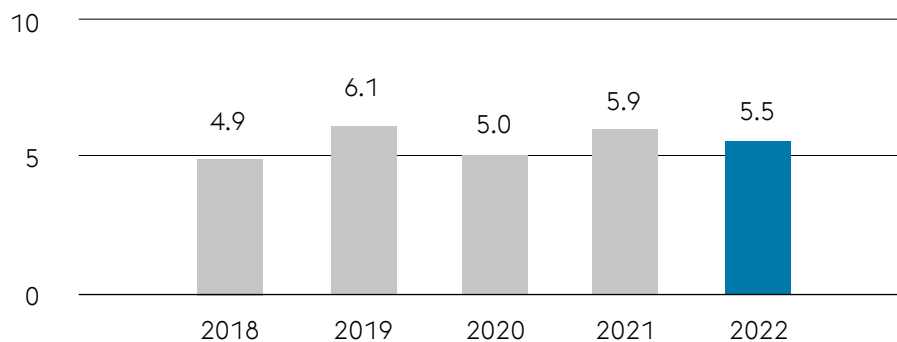
13.4.3 NO_x EMISSIONS

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).

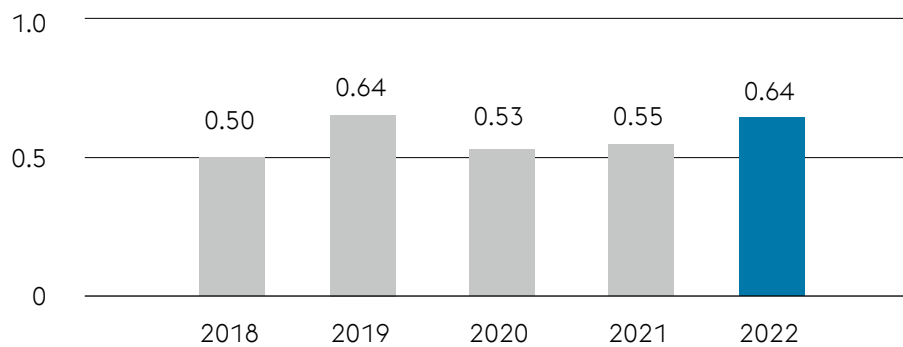
NO_x EMISSIONS

kt



SPECIFIC NO_x EMISSIONS

kg/t product



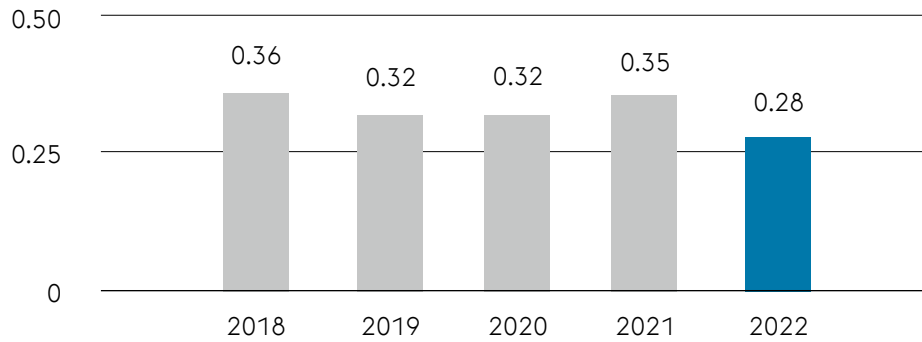
13.4.4 CAPTURED DUST EMISSIONS

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.

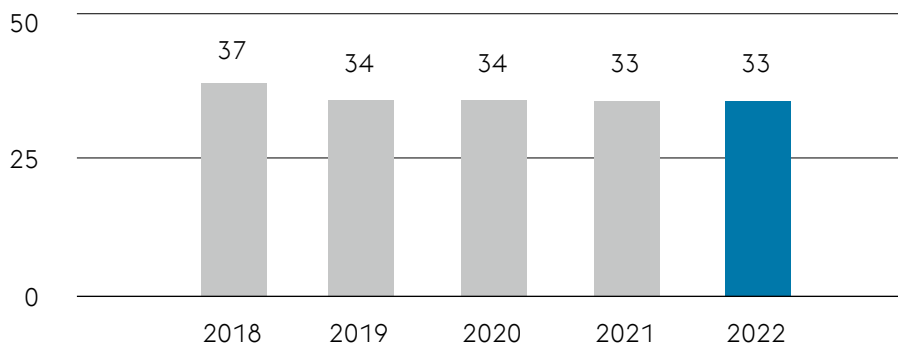
CAPTURED DUST EMISSIONS

kt



SPECIFIC CAPTURED DUST EMISSIONS

g/t of product



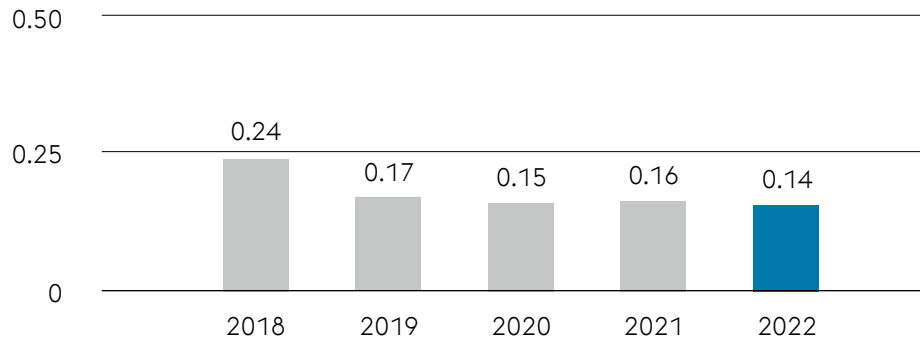
13.4.5 ORGANIC AIR POLLUTANTS

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

