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

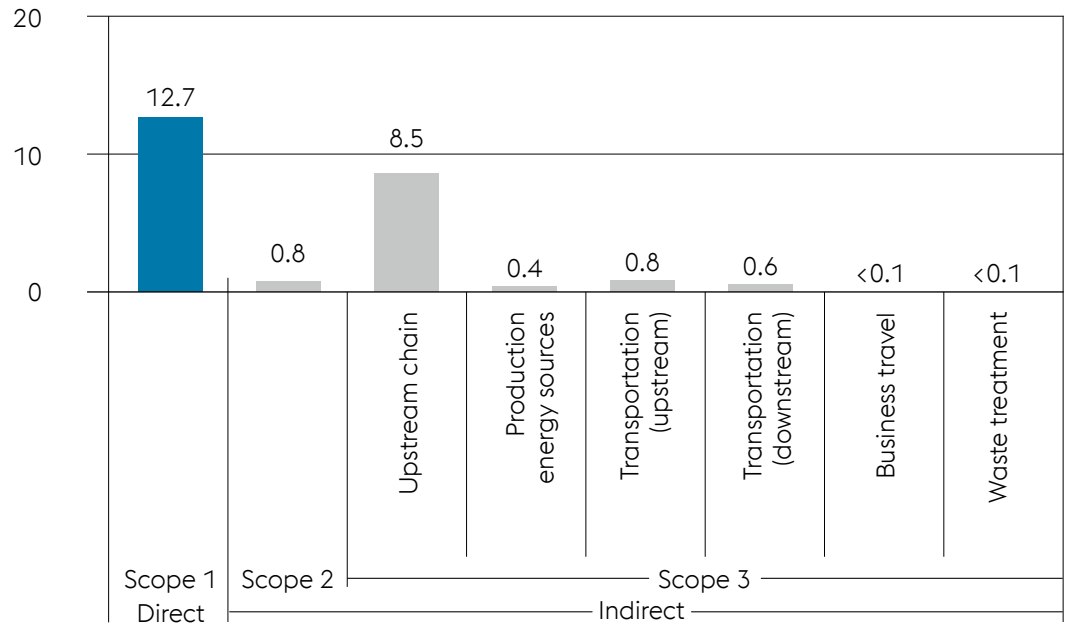
The direct greenhouse gas (GHG) emissions of the approximately 130 production facilities of voestalpine in the calendar year 2018 were 12.7 million tons; the two Austrian plants that produce crude steel (Linz and Donawitz) account for 85% of this amount.

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



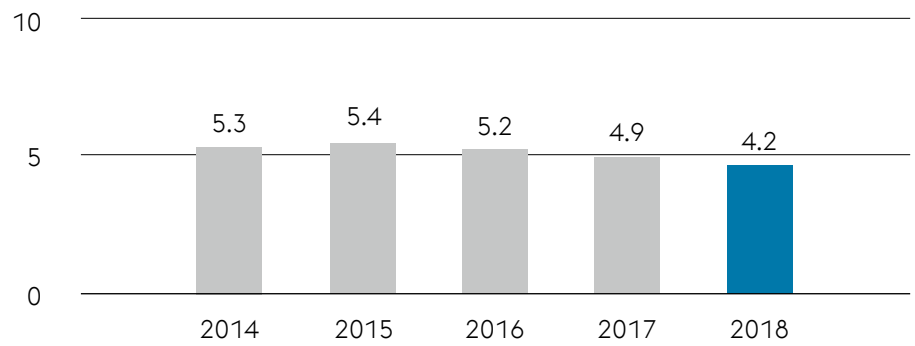
11.4.2 SO_2 EMISSIONS

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.

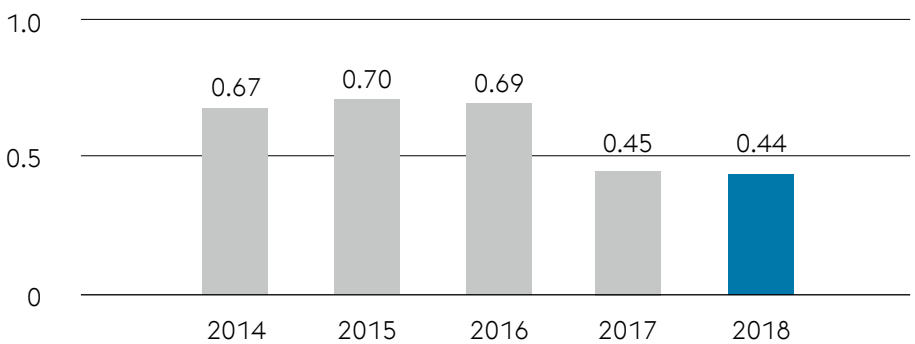
SO_2 EMISSIONS

kt



SPECIFIC SO_2 EMISSIONS

kg/t of product

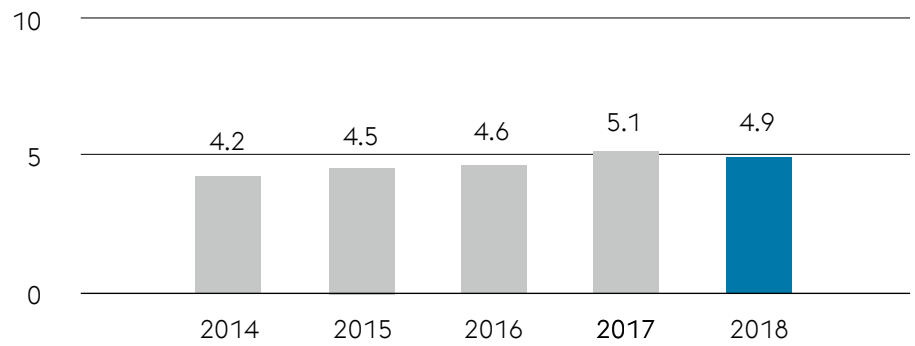


11.4.3 NO_X EMISSIONS

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.

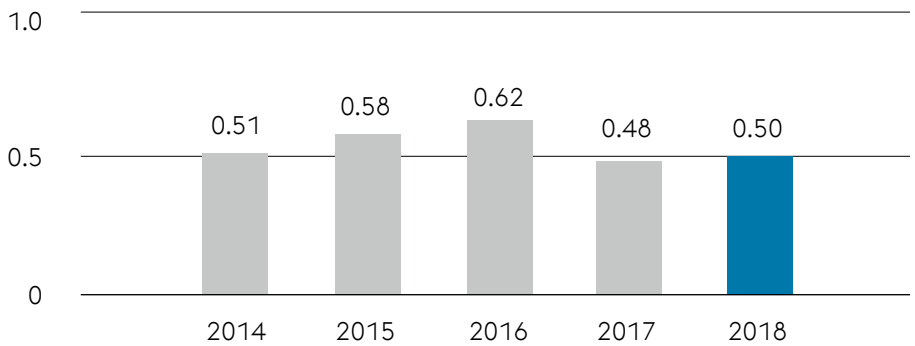
NO_x EMISSIONS

kt



SPECIFIC NO_x EMISSIONS

kg/t of product

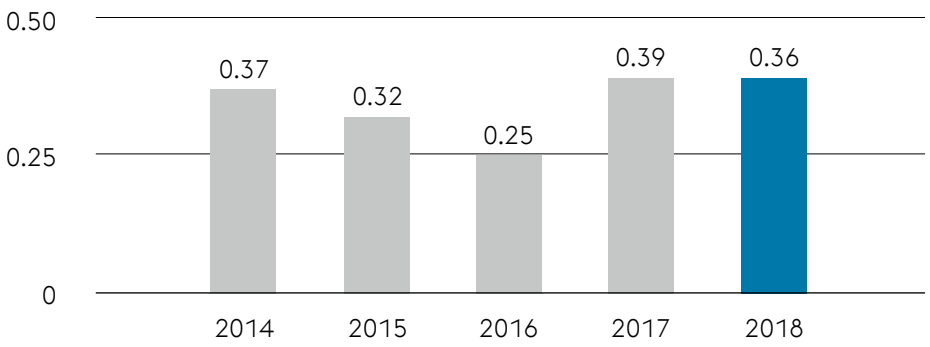


11.4.4 CAPTURED DUST EMISSIONS

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.

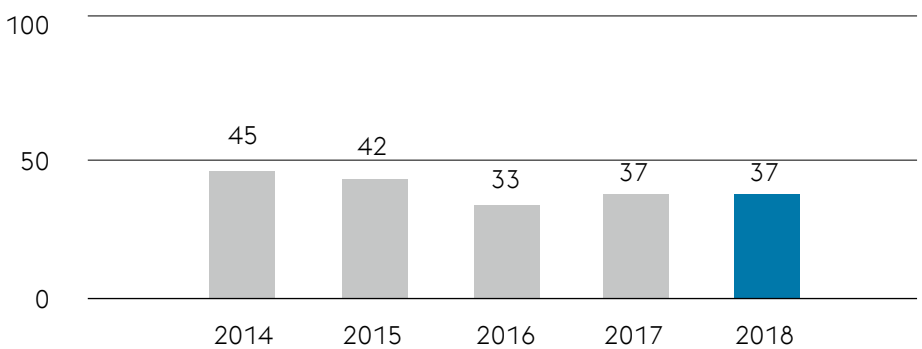
CAPTURED DUST EMISSIONS

kt



SPECIFIC CAPTURED DUST EMISSIONS

g/t of product



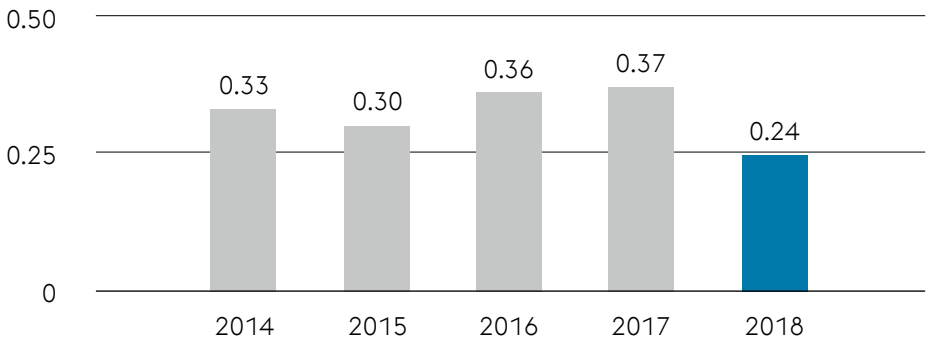
11.4.5 ORGANIC AIR POLLUTANTS

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

kt



SPECIFIC VOC EMISSIONS

g/t of product