# ENVIRONMENTAL REPORT 2019

**Consolidated environmental report for the Linz, Steyrling and Traisen locations**

# HIGHLIGHTS IN THE voestalpine GROUP

April 2017

## Direct reduction plant in full operation

The state-of-the-art plant in Texas uses natural gas as a reducing agent and is the first step toward $CO_2$-reduced steelmaking. See the chapter about climate protection on page 26.

2017/18 business year

## Lower dust emissions in Donawitz

At the Donawitz site, comprehensive measures are being implemented at the sintering plant and blast furnace to reduce future diffuse dust emissions by 15 tons per year.

April 2018


## Construction of the H2FUTURE pilot plant begins

The beginning of construction of what is currently the world's largest PEM electrolysis plant to investigate the production and use of green hydrogen at the Linz site. See the chapter about climate protection on page 26.

September 2018


## EMAS award presented to the voestalpine environmental team

The environmental team of voestalpine has been presented with the EMAS award for its accomplishments in the field of environmental management, internal and external communications, employee involvement and environmental performance.


## EU meets voestalpine

Members of the EU Energy Council from the areas of politics and industry, including the Energy and Climate Commissioner at the time, Miguel Arias Cañete, visited the H2FUTURE electrolysis plant in Linz.

November 2018

## ÖGUT Environmental Award for Road Safety

The PROVAST project submitted by voestalpine Krems Finaltechnik together with ASFINAG has received the ÖGUT Environmental Award, Innovation & City, for digitalized project management.

September 2018

## New production facility for special steels: Environmental flagship project

Beginning of construction on the world's most modern production facility for special steels in Kapfenberg with an investment of roughly 350 million euros. The plant is both a technological and environmental benchmark. The heart of the plant, the electric-arc furnace, is powered exclusively using electricity from renewable energy sources.

## voestalpine named Steel Sustainability Champion

The "Steel Sustainability Champions" initiative of the World Steel Association (worldsteel) honors the most sustainable companies in the industry, including voestalpine AG.

## Blast Furnace A in operation

After 111 days of relining and general refurbishment, the largest production facility in Linz, Blast Furnace A, is now in operation again. The furnace features best available technology such as dedusting and filter systems to improve the efficient use of resources and reduce the environmental impact.

December 2018


## voestalpine at the World Climate Conference

In the Austria Pavilion at COP (Conference of Parties) in Katowice, Poland, voestalpine discussed possibilities of decarbonizing the steel industry and presented the H2FUTURE project.

June 2019

## Global EcoVision Award for H2FUTURE

voestalpine AG receives the Global EcoVision Award of the Austrian Federal Economic Chamber (WKO) for its H2FUTURE project consortium. See the chapter about climate protection on page 26.


## "klima:aktiv mobil" seal awarded for logistics strategy

Award presented by the Federal Ministry for Sustainability and Tourism (BMNT) and the Austrian Federal Economic Chamber (WKO) for a logistics strategy that saves roughly 1600 truck trips and substantially reduces transport-related $CO_2$ emissions.

The content of the consolidated 2019 Environmental Report complies with the requirements of EMAS III Regulation No. 1221/2009 as amended. The content of the updated 2018 Environmental Report complies with requirements of the EMAS III Directive and refer to the validated locations in Linz, Steyrling and Traisen and the respective companies voestalpine Stahl GmbH, voestalpine Grobblech GmbH, voestalpine Giesserei Linz GmbH, voestalpine Camtec GmbH, voestalpine Steel & Service Center GmbH, voestalpine Standortservice GmbH, Logistik Service GmbH, Cargo Service GmbH and voestalpine Automotive Components Linz GmbH. This document is a translation of the validated German document.

# CONTENT

# FOREWORD

**Sustainable production processes, responsible conservation of resources and the implementation of best available technologies are integral parts of our corporate philosophy and business operations.** These activities form the foundation of our claim to long-term quality leadership in products and services.

All areas of the production chain are geared to achieving the most economically efficient use of resources (primarily raw materials and energy) and minimizing the environmental impact of our processes and products. Intense research in the development of environmentally friendly steel production processes and products, measures to increase efficiency, emission reductions and energy savings as well as transparent and efficient environmental management enable us to minimize the environmental impact of our processes and products in the long term. This environmental report references three sites of the voestalpine Group. The report presents transparent and objective data verified by external auditors. As a comprehensive environmental balance sheet for the Linz, Steyrling and, for the first time, Traisen sites, this publication is intended to make a major contribution to our constructive and sustainable environmental policies.

Environment and climate protection have increasingly become the focus of social and political discussion. Since the middle of the 1980s, we have been on a long, ambitious and exemplary path to avoiding and sustainably reducing emissions. We will continue to be equally committed to continuously further developing our processes in the interest of further gradual decarbonization in our production processes in order to be well prepared for the future challenges of climate and environmental protection.

Our current understanding of the environment is also shaped by our own active research in the development of environmentally friendly steel products that play an important part in improving our every-day climate and resource situation. Steel makes savings possible that far outweigh the emissions generated during production. Steel is almost 100% recyclable and remains usable as a material regardless of the number of its lifecycles.

Our commitment to climate protection is paired with concrete action, most importantly our costly research and

development projects that focus on fundamentally new low-carbon technologies. In addition to the challenge of researching and developing alternatives to blast-furnace-based steel production, the ultimate goal is to be able to operate the production systems in an economically feasible manner. The aim of voestalpine is to reduce $CO_2$ emissions by initially converting a part of our carbon-based steel production using the integrated blast furnace route into electric steel production, flexibly combining raw materials and increasing the use of hydrogen (natural gas, coke gas or pure hydrogen) and renewable energy. Depending on technical and economic availability, the proportion of hydrogen will be increased in the long term so that $CO_2$ emissions can ultimately be reduced by more than 80%.

Our research and development activities, including upgrades to breakthrough technologies (H2FUTURE, SuSteel), require political support, intelligent funding instruments and compensation mechanisms that ensure profitability, the investment capacity of energy-intensive companies and competitiveness, at least at the European level.

At voestalpine, we are also focusing on the possibility of carbon capture and usage (CCU). Current and future projects are concerned with the conversion of $CO_2$ from process gases and the use of hydrogen in the energy and chemicals sector. We have dedicated a special section of this environmental report to this topic because we want to show how intensely we focus on decarbonization by taking concrete measures and implementing dedicated projects.

We are always open to fact-based discussions with stakeholders on topics related to energy and climate policies. Out of our responsibility for more than 50,000 employees worldwide and in the interest of environmental and climate protection, we make existential decisions, carry out important planning and implement measures based on pertinent figures, data and facts.

The environmental team at voestalpine and I sincerely hope that the new environmental report will provide you with an interesting overview of our strategic and operational environmental protection measures as well as more specific performance information and future plans.

**DI Hubert Zajicek, MBA**
Member of the Management Board at voestalpine AG
Chairman of the Management Board in the Steel Division

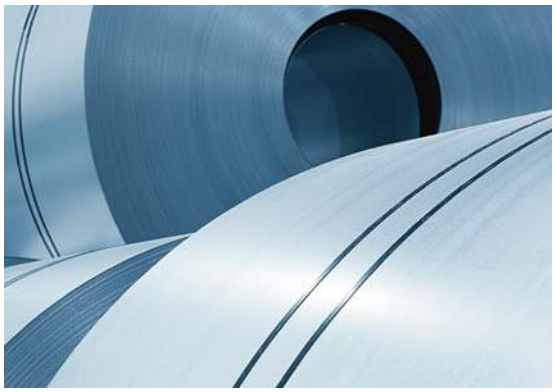
# OVERVIEW OF THE voestalpine GROUP

**The business units of voestalpine boast worldwide leadership in combined material and processing expertise.** As a technology and industrial-goods corporation, the voestalpine Group focuses on products and systems made of steel and other metals and provides unsurpassed quality for technology-intensive industries and market niches.

With its highest-quality products and systems made of steel and other metals, voestalpine is one of the leading suppliers to the automotive, household-appliance, oil/gas and aviation industries worldwide. voestalpine is also the world market leader in complete railway infrastructure systems, tool steels and special sections. With its headquarters in Linz and a total of 500 subsidiaries and locations in more than fifty countries, voestalpine is represented on all five continents of the world. Each company in the voestalpine Group is assigned to one of four divisions. The voestalpine Group achieved a sales volume in the 2018/19 fiscal year of 13.6 billion euros and an operative result (EBITDA) of 1.6 billion euros. The Group employed roughly 52,000 employees. Employees hold 14.8 percent of the corporate shares.

The voestalpine Group consists of four divisions, and in their core segments, these divisions are among the leading suppliers in Europe or in the world.

IN THEIR CORE SEGMENTS, THE FOUR DIVISIONS IN THE voestalpine GROUP ARE AMONG THE LEADING SUPPLIERS IN EUROPE AND THE WORLD.



## Steel Division

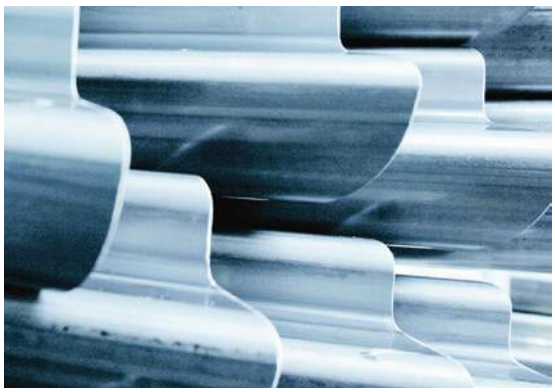
Of the four divisions in the voestalpine Group, the Steel Division boasts of the highest sales figures and assumes quality leadership in the market for highest-quality steel strip and worldwide leadership in the field of heavy plates for sophisticated applications and large turbine housings.

## High Performance Metals Division

The High Performance Metals Division specializes in the production and processing of technologically advanced high-performance materials and customer-specific services such as heat treatment, high-tech surface treatment and additive manufacturing processes.

## Metal Engineering Division

The Metal Engineering Division is the global market leader in the field of railway infrastructure systems and related signaling technologies (railway systems). The Industrial Systems department in the division is also the European market leader for quality wire, a leading supplier of seamless tubes and a complete supplier of welding solutions. Customers are found in the railway infrastructure, oil and gas, machinery, automotive and construction industries.



## Metal Forming Division

The Metal Forming Division is the voestalpine center of competence for sophisticated section, tube and precision-strip steel products and for ready-to-install system components made of pressed, punched and roll-formed parts. With an industry-unique combination of material and processing expertise and worldwide presence, the division is the partner of choice for innovative and quality-oriented customers.

# COMPANY PRINCIPLES

**The Steel Division strives toward further expansion and long-term establishment of quality, technology and profit leadership in the European steelmaking industry and has taken the challenge to combine growth and competitiveness with ecological and social responsibility.** The integrated management system for quality, safety, the environment and risk makes a valuable contribution to the achievement of these objectives, which is why the Management Board has adopted the following principles:

## CUSTOMER ORIENTATION

Our customers, not us, define what quality is, and that is what we deliver. We orient our processes to customer needs and thus lay the foundation for sustained customer satisfaction.

## INNOVATION AND CONTINUOUS IMPROVEMENT

We are not satisfied with a performance that is anything less than excellent. Innovation and continual improvement are the prerequisites to the success and added value of our company. Each employee has the task and the challenge to continually make improvements.

## EMPLOYEE DEVELOPMENT

Competent and motivated employees are the most important force in our company. This is why we require the appropriate knowledge and a keen sense of responsibility from our staff members and cooperation with each other at all levels. We create a modern and attractive place to work, a place where each of our employees can flourish.

## OBJECTIVES AND FIGURES (MEASURABLE SUCCESS)

Initial concrete objectives and effective communication of the same make implementation of our strategy possible. Figures show us whether we are on course or need to take corrective measures.

## RISK MANAGEMENT

The recognition of opportunities and risks that can either promote or endanger the growth of corporate value is an important management task and thus an integral part of our activities on a corporate level.

## SAFETY AND HEALTH

The company and the employees are mutually responsible for safety and health. This is why we create safe places to work for all our employees, promote self-responsibility and help employees conscientiously adopt safe and healthy practices both at work and in their leisure time.

STRIKING THE RIGHT BALANCE BETWEEN PRODUCTIVITY, QUALITY, SAFETY AND THE ENVIRONMENT IS OUR KEY TO REMAINING "ONE STEP AHEAD."

## PREVENTION

Accidents at work, health hazards, adverse effects to the environment, quality issues and damage to production systems are avoided through preventive measures. Errors that occur in spite of our every effort are seen as an opportunity to learn. For this reason they are documented, analyzed and corrected.

## VENDORS

We foster partnerships based on mutual trust and understanding with our suppliers in order to ensure the highest levels of performance for our customers, whom we include in our development activities.

## ENVIRONMENTAL PROTECTION

Thrift in our consumption of natural resources and various forms of energy and the minimization of harmful effects are beneficial from an ecological perspective as well as in saving costs. We are well aware of our social responsibility and set standards in the field of environmental technology as far as our possibilities allow.

## COMPANY AND PARTNERSHIPS

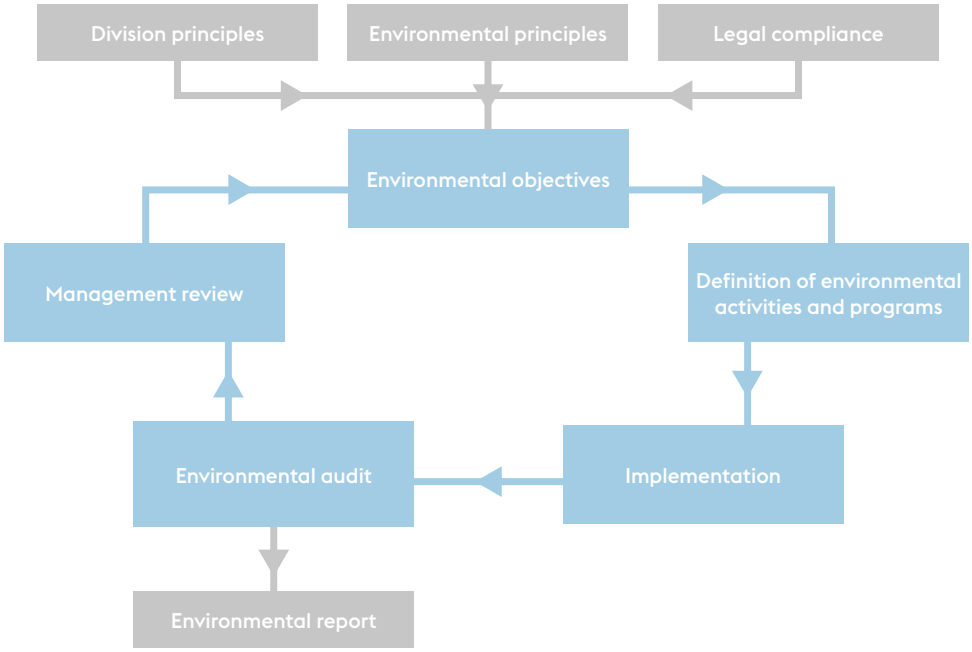
The entire corporate Group is responsible for our ultimate success. Open communications and long-term partnerships with every interest group are the basis for solutions based on sustainability. The consideration of all concerns from our customers and partners and compliance with legal regulations are an integral part of our strategy.

# ENVIRONMENTAL STRATEGY AT voestalpine

## Overview of focal points and organization

**In addition to environmental protection in production operations**, strategic topics such as energy and climate policies as well as the global expansion of environmental management are increasingly in focus.

ENVIRONMENTAL PROTECTION TRULY BEGINS WITH EVERY INDIVIDUAL EMPLOYEE AND IS THUS FIRMLY ANCHORED IN THE PHILOSOPHY OF THE COMPANY.




Strategic Environmental Management at voestalpine AG, also responsible for environmental management in the Steel Division, coordinates ecological issues beyond operational environmental protection.

At the beginning of the 1970s, company management decided for the first time to implement a program with environmental principles and targets and to involve the employees in this effort. The former Environmental Protection and Environmental Technologies department was established in 1985. The department worked continually to raise awareness for environmental issues and to establish a strong environmental management system.

Active environmental protection is now firmly anchored in the activities of our employees and in the corporate principles of the voestalpine Group.

## Broad-based environmental management

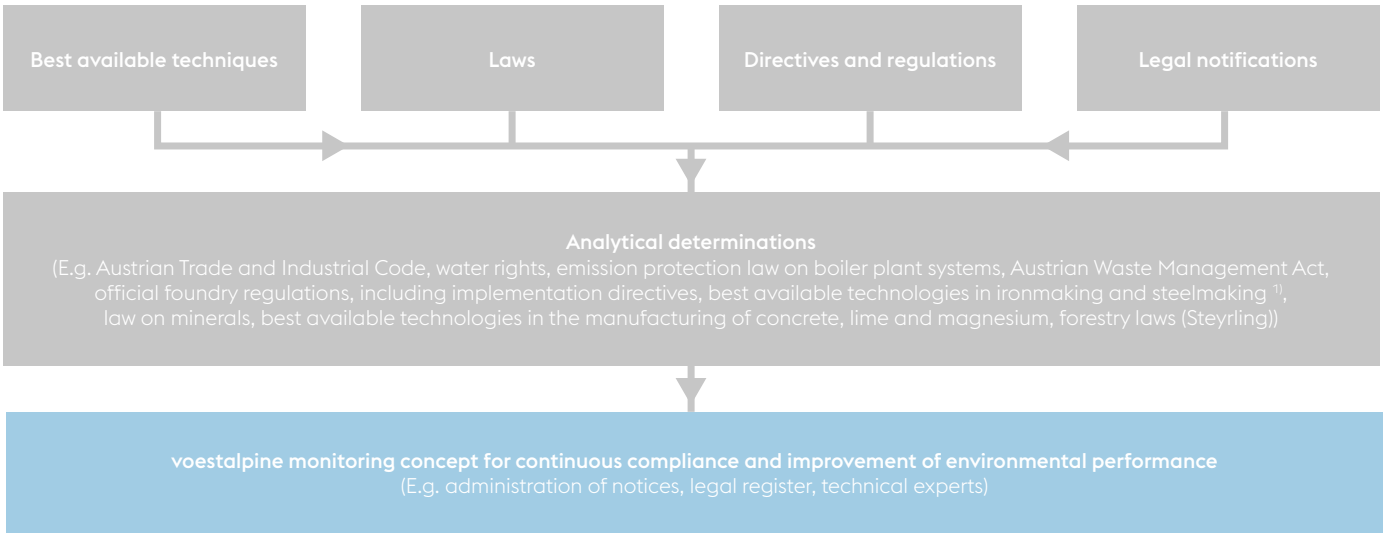
Of the 130 Group companies worldwide who have implemented an internal environmental data management system, roughly 60% of them use a environmental management system pursuant to ISO 14001, accounting for 100% of crude steel production. About 15% of the sites have also been certified according to EMAS, and more than 20% have certified energy management systems pursuant to ISO 50001. Ongoing implementation of the ISO 14001 standard at the US site in Corpus Christi, Texas, will be completed by the end of the 2019/2020 fiscal year.

The Linz, Steyrling and Traisen sites of voestalpine operate a certified/validated environmental management system pursuant to ISO 14001 and EMAS. As part of the integrated management system, concrete objectives have been identified, a program has been in place to implement measures and regularly audit progress. The same applies to our legal compliance policies that ensure company adherence to all applicable legal regulations. Any non-consensual operation is reported to the authorities, and appropriate corrective measures are taken. Specialized environmental skills and expertise have been made possible only by creating a high level of environmental awareness among the employees throughout the Group. Additionally, voestalpine regularly participates in the national EMAS exchange of experience (most recently in April 2019 as the hosting company in Linz).

## Environmental strategy at voestalpine

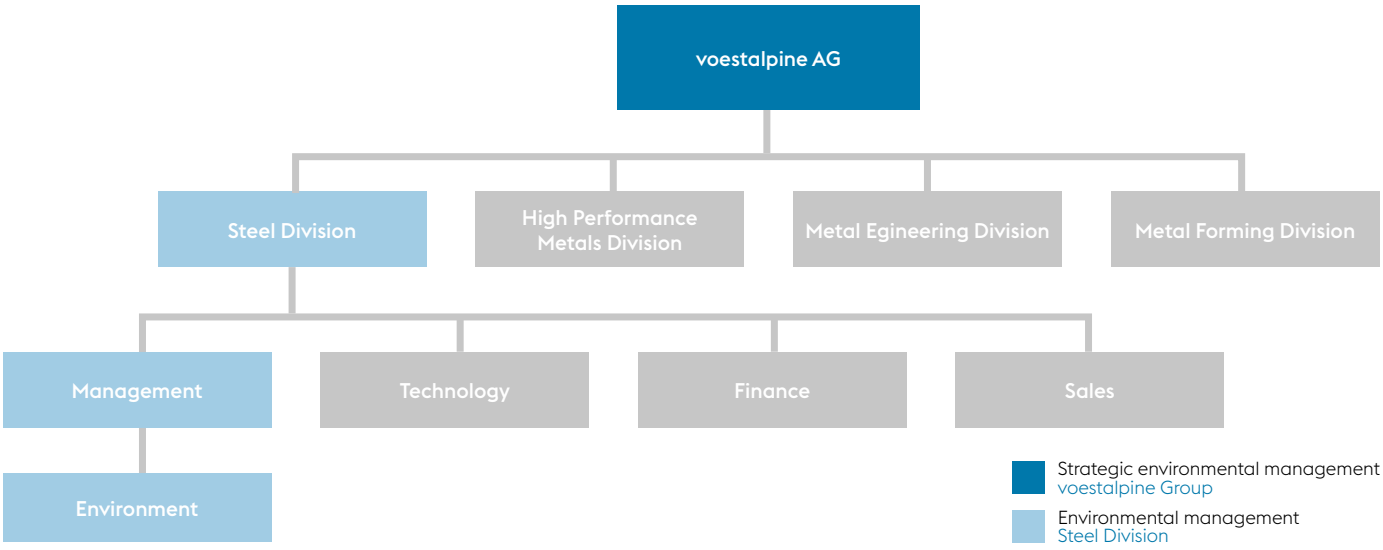
Responsibilities in environmental management and communications have changed considerably. Environmental protection in production operations has been expanded to include broad and increasingly complex cross-cutting

## COMPLIANCE WITH ENVIRONMENTAL REGULATIONS




issues of high strategic importance to the Group with regard to complex internal and external cooperation. This applies particularly to energy and climate policies, related technology issues and Group environmental issues, as well as topics such as product sustainability and lifecycle assessment.

Strategic environmental management is also responsible for the coordination of stakeholder communication (internal and external, including interest groups at national, European and global level). This includes solution-oriented dialog with political decision-makers, environmental organizations and the scientific community. Internal and external communications are focused on environmental and energy issues. Employees in environmental management are technical experts in the Steel Division and are involved in environmental issues such as emissions, water, waste and resource efficiency at the Linz, Steyrling and Traisen sites.




Each of the four divisions has an environmental coordinator, as does each of the 130 Group companies who deal with environment-related issues. The environmental network also includes other functions and business areas that focus on specific topics such as research, strategies, technologies, communications, investor relations, corporate responsibility, energy, finances and taxes.

[1] Best available techniques in relation to the production of iron and steel

# ENVIRONMENTAL PRINCIPLES

**The conviction that business success, environmental awareness and socially responsible behavior are inseparable from each other has always been a core element of the company philosophy.** Sustainable environmental protection and social balance can only exist, however, if they are implemented within an economically feasible framework.

The following environmental principles are understood in the context of individual voestalpine companies who have been faithful to the environmental principles of the World Steel Association.

## HOLISTIC RESPONSIBILITY FOR OUR PRODUCTS

voestalpine produces and develops products and system solutions in close cooperation with its customers and suppliers, fully taking ecological demands such as long-life, resource preservation and optimum recyclability into account.

## OPTIMIZATION OF PRODUCTION TECHNOLOGIES

voestalpine runs its facilities in an economically sensible manner using the best available technologies to minimize the environmental impact. Efficient use of raw materials and energy is of prime importance to voestalpine.

## IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT SYSTEMS

voestalpine facilitates the development of environmental management systems in its Group companies. The core of these management systems is the observance of environmental obligations and the maintenance of continuous improvement programs.

## EMPLOYEE INTEGRATION

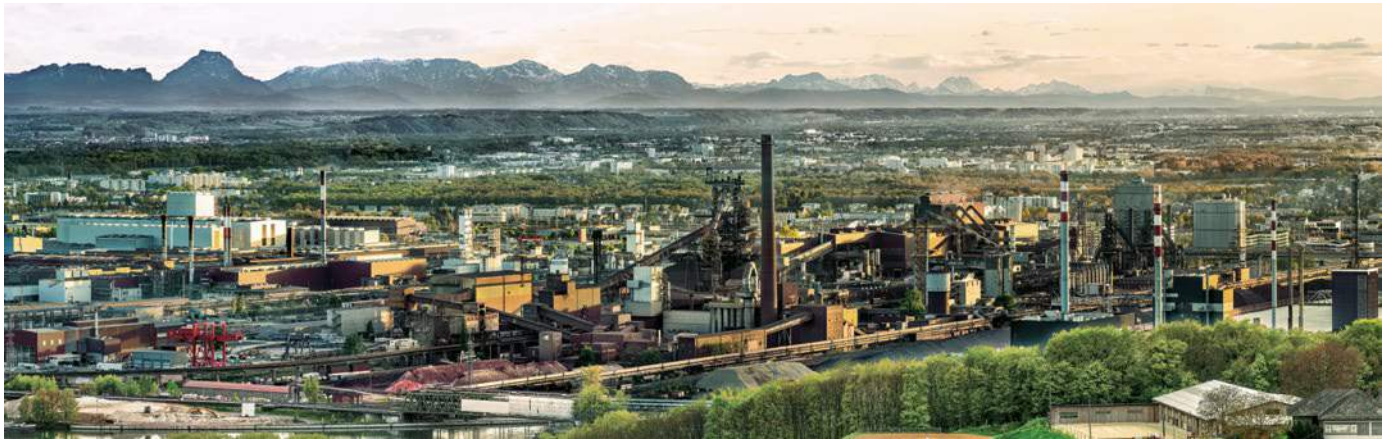
voestalpine sees environmental protection and continuous improvement as the task of each individual employee at all levels and in all areas of business. Responsible and expert employees ensure the best possible modes of operation of technical facilities and contribute through environmentally aware behavior to continuous improvement.

## OPEN AND OBJECTIVE DIALOG

As the basis for shared and sustainable solutions, voestalpine maintains open and objective dialog with internal and external interest groups in all issues relevant to the corporate Group's environmental impact. The Group-wide exchange of knowledge between all production sites is particularly encouraged.

# voestalpine Steel Division

**The voestalpine Steel Division is a strategic partner to Europe's most renowned automobile manufacturers and large automotive suppliers.** The Steel Division is also one of the largest partners to the European consumer goods and household-appliance industries as well as to the mechanical engineering industry. Heavy plates are manufactured for the energy sector with applications in the oil and gas industry under the most extreme conditions, such as deep-sea pipelines and arctic pipelines. The Steel Division is a world leader in the casting of large turbine housings.



During the 2018/19 fiscal year, the Steel Division achieved a sales volume of 4.9 billion euros, which corresponds to 35% of the Group figure. The Steel Division employs roughly 11,000 staff members.

**voestalpine Stahl GmbH**
The parent company of the division is voestalpine Stahl GmbH, which operates a fully integrated metallurgical plant with all the process steps, including the coking plant, sintering plant, blast furnaces, steelmaking plant, hot-rolling and cold-rolling mills as well as galvanizing and organic coating lines. Our products include high-quality hot-rolled, cold-rolled, electrogalvanized, hot-dip galvanized and organic-coated steel strip to form the foundation for a wide variety of further processing steps.

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**Limestone quarrying and preparation at the Steyrling location**
Carbonate stone has been mined at Steyrling, Upper Austria, since 1948. Approximately 50% of the limestone is processed in shaft furnaces into burned lime. The most significant customers are the steelmaking facilities in Linz and Donawitz. A smaller share of the fine burned lime is sold to the construction industry, wastewater treatment facilities or the soil fertilizer and chemical industries. 50% of the mined limestone is used as limestone chips (unburned lime), primarily in the sintering plant in Linz. A small portion that is also unburned leaves the works as armor stones, primarily for use in slope reinforcements along waterways.

**Traisen location**
The location of voestalpine Giesserei Traisen GmbH has been in Traisen since its foundation in 1833. The company is a reliable worldwide supplier of high-quality castings.

The Traisen foundry is committed to continuously improving its production technologies in order to make the best possible use of valuable resources.

With its large product portfolio, the Traisen foundry supplies around 8,000 tons/year of castings made of steel and spheroidal graphite iron to customers worldwide. The most important market segments include the energy and machinery sectors. Over several years, the markets for special applications and rail vehicle components have also become increasingly important.

# voestalpine Grobblech GmbH

**A company providing products and solutions to demanding niche markets, voestalpine Grobblech GmbH** is a fully owned subsidiary of voestalpine Stahl GmbH and has its headquarters in Linz, Austria.


The company is known throughout the world as a supplier of thermomechanically rolled structural steels for offshore rigs, sour-gas-resistant hot-rolled tube plates and high-strength deep-ocean plates for pipeline construction.

As the world's largest manufacturer of roll-bonded clad plates and heads, the company supplies shell plates and heads for advanced vessels from a single source. An innovative solution provider in the areas of steel structures and bridge building, the company is a premium supplier of high-strength and wear-resistant steels for vehicle, crane and mining applications.

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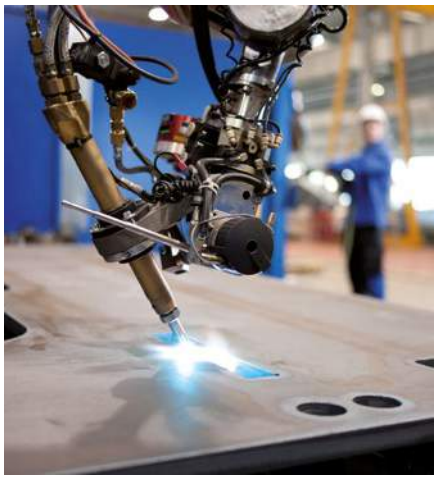
# voestalpine Steel & Service Center GmbH

**The voestalpine Steel & Service Center Group processes two million tons of steel each year and is one of the largest steel service centers in Europe.** In collaboration with voestalpine Steel Service Center Polska and voestalpine Steel Service Center Romania, the group of companies employs roughly 750 employees and achieves an annual sales volume of approximately one billion euros.



The product mix ranges from slit strip and cut-to-length sheets and tailor-made blanks for the automotive industry to cut shapes for the machinery industry. As part of an integrated steel works of the Steel Division, we supply products of the highest voestalpine quality.

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# voestalpine Giesserei Linz GmbH

**The parent company, voestalpine Giesserei Linz GmbH, is a fully owned subsidiary of voestalpine Stahl GmbH and employs approximately 300 staff members.** The Group operates companies in Austria (Linz and Traisen) and China (Yinchuan and Shanghai)

and has established an international reputation in the production of steel castings, ductile cast iron and non-ferrous metal castings. Its two business units are represented by a steel foundry and a non-ferrous-metal foundry. The steel casting foundry is a world leader in the manufacture of high-quality castings ranging between 10 and 200 tons in unit weight. The castings find their applications predominantly in the energy sector and in mechanical engineering. They are delivered in both rough and machined condition. The non-ferrous-metal foundry delivers high-quality and maintenance-free sliding components (made of brass, copper, aluminum) and self-lubricating compact sliding elements for the automotive industry.

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# voestalpine Camtec GmbH

**The system patented by voestalpine Camtec GmbH features a long service life as well as high speed and precision.**

The wide range of innovative and tolerance-precise products supplied by voestalpine Camtec meets all process requirements and has convinced renowned customers for many years.

A world leader in the production of cam units and maintenance-free cam sliders, voestalpine Camtec GmbH supplies high quality to the automotive and mechanical engineering industries.

As an established partner to renowned customers, voestalpine Camtec has access to an international service and sales network with headquarters in Linz, Austria.

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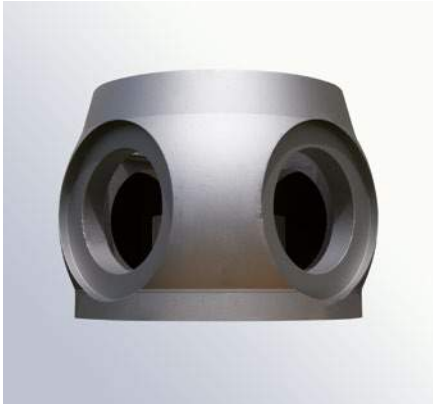
# voestalpine Giesserei Traisen GmbH

**In meeting extremely high customer requirements, voestalpine Giesserei Traisen GmbH is a reliable supplier of high-quality castings that are always in high demand.**



We stand for innovative and total solutions that go far beyond the supply of castings. Based on customer specifications, lightweight to medium-weight castings with complex geometries are manufactured in more than 100 steel, nickel-base and spheroidal graphite cast iron grades. The customers of voestalpine Giesserei Traisen GmbH can be found worldwide in a wide variety of industries. Our well-trained employees guarantee added value for our customers, from well founded advice to precision machining and assembly services. State-of-the-art facilities and production methods provide safety for employees and the environment. Wholly owned by voestalpine Giesserei Linz GmbH, voestalpine Giesserei Traisen GmbH currently employs approximately 300 staff members.

**Environmental focus of Giesserei Traisen GmbH**

The location of voestalpine Giesserei Traisen GmbH has its roots in Traisen and is divided into two sections by a river of the same name, the Traisen. Our closeness to nature and the environment has also led to increased awareness of our surroundings since the company was founded in 1833.

The Traisen foundry is a worldwide supplier of high-quality castings and is committed to continuously improving its production routes in order to make the best possible use of valuable resources. For example, depending on the production volumes, the most efficient unit can be selected from among the two arc furnaces and two induction furnaces. In addition, the AOD converter is used to produce sophisticated steel grades.

In collaboration with the steelmaking plant, sand molds consisting of chromite and quartz sand are provided for casting. After the cooling phase, the casting is separated from the mold, and the sand is fed into a regeneration process, making it possible to recycle 93% of the sand.

The energy required for the production processes is provided in part by two company-owned hydro-power plants. Process and drinking water is provided by natural springs in Reisberg as well as by a water well located on site.

The products of the Traisen foundry are in great demand, especially in the energy industry for steam turbines, gas turbines, offshore installations, oil and gas as well as in the machinery industry. Special applications and rail vehicle components are also included in the product portfolio. Roughly 8,000 tons of castings made of steel and spheroidal graphite iron are produced annually. The weight of the castings varies between 20 kg and 12 tons.

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# Logistik Service GmbH

**Logistik Service GmbH (LogServ) was established in 2001 as an affiliated company of voestalpine Stahl GmbH.**

The company is a full-service provider for industrial logistics and offers innovative solutions tailored to specific needs and company processes.


Customers are primarily at home in the metal production and processing, construction and processing industries, mechanical engineering and plant building and the automotive and automotive supply industries.

In the railway sector, Logistik Service GmbH serves operators of plant and connecting railroads, private railway traffic companies and private freight car rental companies. At the voestalpine site in Linz, LogServ operates Austria's largest railway feeder line and its own Danube river port with efficient unloading facilities.

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# Cargo Service GmbH

**Cargo Service GmbH (CargoServ) was established in 2001 as a wholly owned company of Logistik Service GmbH.**

The company is established in the European railway network and offers as a private player alternative strategies for block train freight transportation in the public railway network.


Railway and other services are performed for customers outside the Group in the field of freight logistics.

The company is also developing new process-optimized strategies for international transport as part of a comprehensive logistics network.

As a private rail transport company with a high level of expertise, CargoServ offers a comprehensive range of services.

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# voestalpine Standortservice GmbH

**A fully owned subsidiary of voestalpine Stahl GmbH, voestalpine Standortservice GmbH has been active since 2011 as an infrastructure service provider for the Steel Division and third-party companies at the Linz site.** The areas of responsibility include vocational medicine, plant security and the works fire department.

**Vocational Health Center**
The Vocational Health Center offers occupational medicine, occupational health checkups, physiotherapy, company rescue services and company health programs. The occupational medical staff carries out occupational medical examinations pursuant to the Ordinance on Health Monitoring at the Workplace (VGÜ) and works preventively together with the occupational safety department. Both acute and chronic conditions are treated at the medical center.

Treatments can be augmented with our physiotherapy for both acute conditions and preventive cases. Emergency paramedics are available 24 hours a day. A major focus is on promoting occupational health at our site.

**Works Security**
The services of Works Security of voestalpine Standortservice GmbH range from consultation focusing on security issues, planning, alarm systems, creation of safety and security strategies and daily activities in securing the works premises. State-of-the-art security services are guaranteed by highly qualified personnel, personal dedication, continuous education and training of our employees as well as by effective cooperation with internal and external blue-light organizations.

**Works Fire Department**
The Works Fire Department is responsible for fire protection at the Linz site. In addition to firefighting and active prevention of hazards (technical operations), the works fire department is also an expert contact for issues regarding holistic fire protection and preventive measures. In addition to ongoing inspections and testing of fire protection equipment, great attention is also paid to ensuring that employees undergo regular training and receive further education.

**voestalpine**
**Standortservice GmbH**
voestalpine-Straße 3
4020 Linz, Austria
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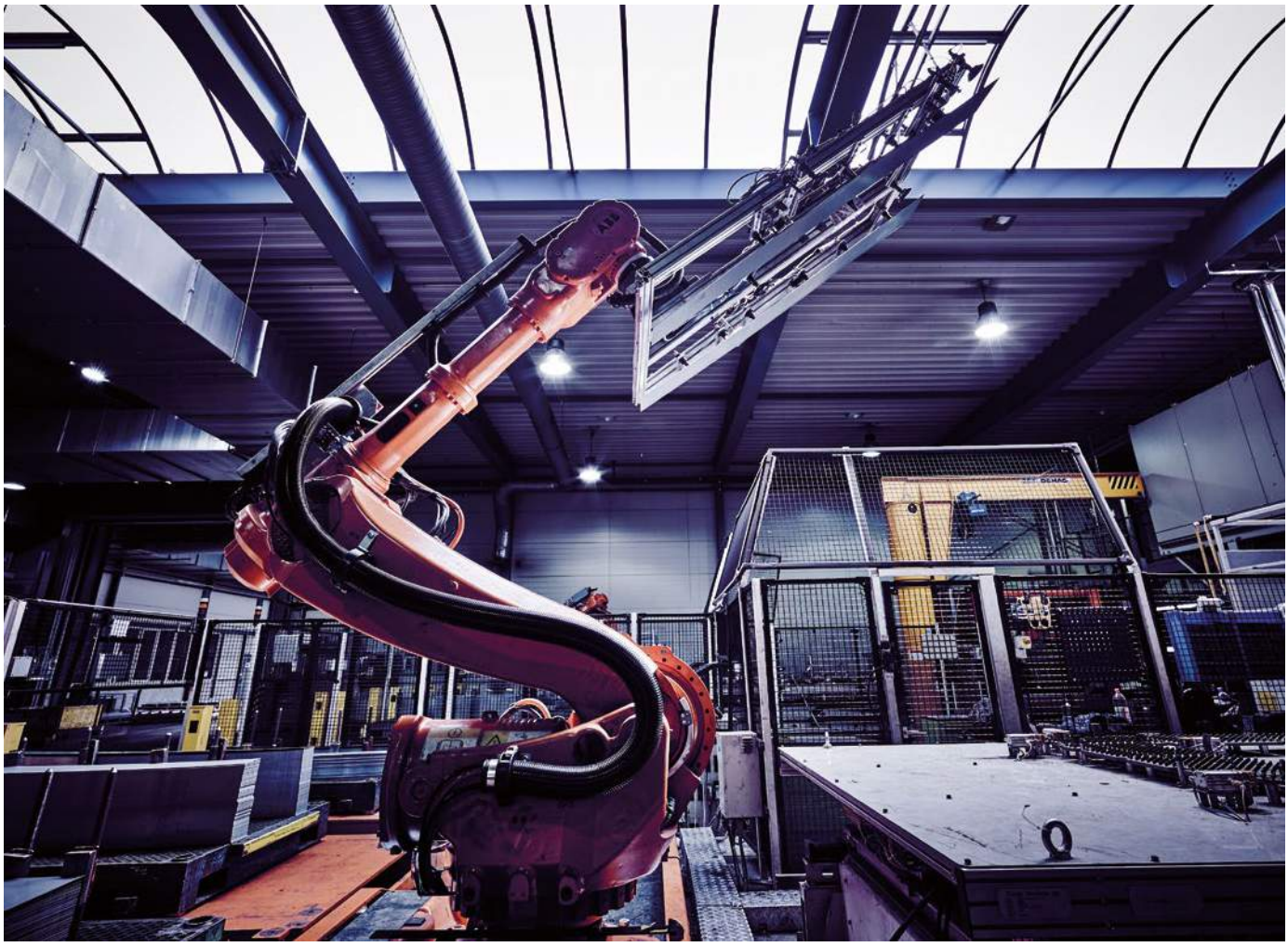
# voestalpine Automotive Components Linz GmbH

**Laser-welded blanks allow creative solutions for more security and less weight in the automobile.** As a 100% subsidiary of the Metal Forming Division, voestalpine Automotive Components Linz GmbH has been providing innovative components in large-scale serial production since 1997 to renowned customers in the automotive industry.



The services of voestalpine Automotive Components Linz GmbH include the development, optimization and quality-controlled production of laser-welded blanks with linear, semi-linear and non-linear weld seams for applications in the automotive industry. The main product of voestalpine Automotive Components Linz GmbH is the laser-welded blank that is produced through layer-joining two or more sheets of differing thicknesses, material strengths or with different coatings. Blanks are important preliminary products for pressed parts used in the car bodies. This range of tailor-made products, referred to in the international market as tailor-welded blanks, makes significant contributions with respect to improved cost efficiency, weight reduction, environmental stability and functional optimization in the field of automotive body parts.

voestalpine Automotive Components Linz GmbH, a company in the Metal Forming Division, is dedicated to the environmental regulations of the voestalpine Group as well as the Charta for long-term and sustainable development as set forth by the International Chamber of Commerce (ICC). In an effort to reduce environmental impact, voestalpine Automotive Components Linz GmbH uses the best available and economically justifiable technologies. Of course the company is pleased to comply with every applicable environmental regulation. The company has adopted the following policies and objectives in its efforts to continually improve operations and to protect the environment in its production facilities.

**voestalpine Automotive Components Linz GmbH**

- Environmental protection deemed an important responsibility of company management
- An environmental management system for implementation of concrete environmental activities
- Environmental management system in accordance with ISO 14001 and EMAS
- Knowledge and keen sense of responsibility among staff members and cooperation at all levels
- Raw materials and energy consumed as sparingly as possible
- Environmental impact reduced as far as possible in production processes and activities
- Open and matter-of-fact dialog with customers, governmental officials, neighbors and the interested public
- Preference to material and thermal recycling
- Product development activities to reduce the environmental impact of production, thus saving weight, reducing fuel consumption and improving material usage

The management of voestalpine Automotive Components Linz GmbH expressly endorses the above principles.

**voestalpine Automotive Components Linz GmbH**
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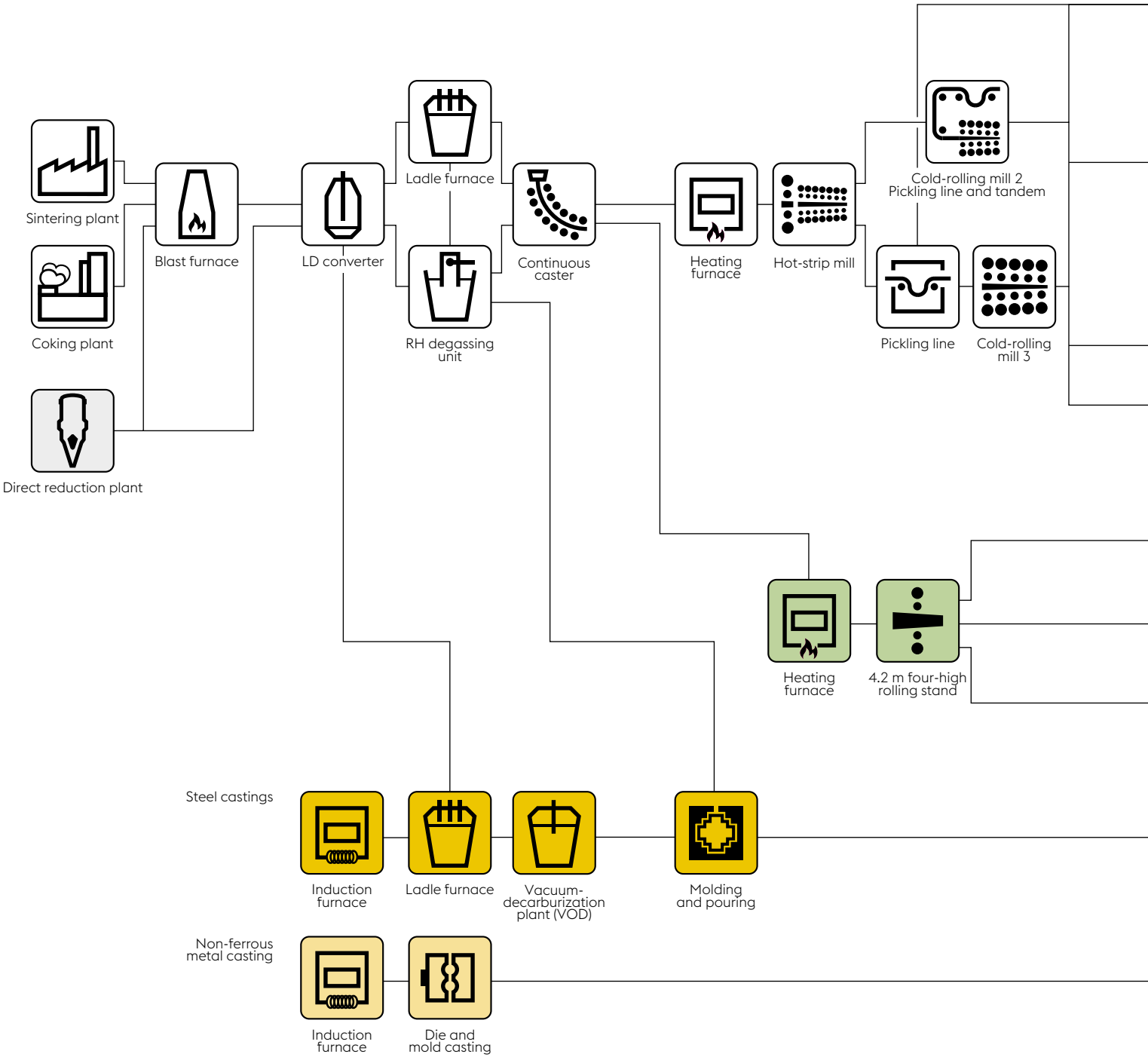
# PRODUCTION PROCESSES

## HOT METAL PRODUCTION

## STEELMAKING AND CASTING

## ROLLING



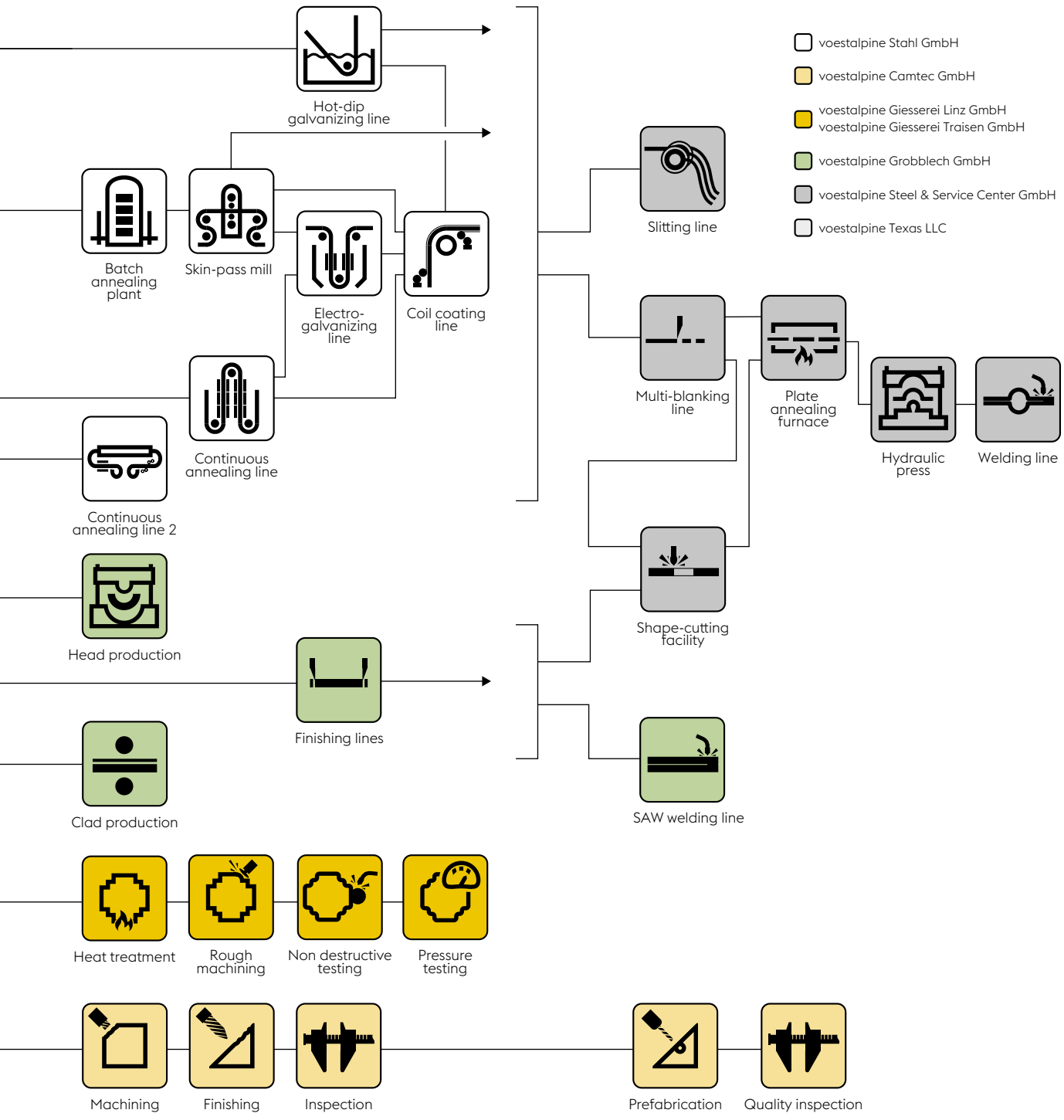

Ironmaking at the Linz site comprises the production of coke in the coking plant, sinter as a burden feedstock in the sintering plant, hot metal in blast furnaces A, 5 and 6, the mining and processing of limestone and further processing to quicklime at the Steyrling site.

In the steelmaking plant, crude steel is processed from hot metal after deep desulfurization in the LD converter and is cast into slabs. Foundry companies produce high-tech foundry products from crude steel, at the Linz site following the vacuum decarbonization plant (VOD) and at the Traisen site following the argon-oxygen decarbonization plant (AOD).

Strip and heavy plate products are made from the cast slabs the in rolling mills.

## SURFACE TREATMENT

## PROCESSING




In order to maintain the highest quality standards, steel strips made by voestalpine are further processed during finishing processes (hot-dip galvanizing, electrogalvanizing and organic coating). In the field of heavy plates, the refining process comprises the production and pressing of (clad) plates and heads. Cast parts are machined in the foundries.

Customers can be provided with tailor-made products delivered by the voestalpine LogServ Group. These products include tailor-made, laser-welded blanks produced by voestalpine Automotive Components. The infrastructural services of voestalpine Standortservice GmbH at the Linz site provide support for the entire process.

# CLIMATE PROTECTION MEASURES

**The production processes of the steel industry consume large amounts of energy and are thus emission-intensive.**

In order to reduce $CO_2$ emissions and make an active contribution to climate protection, voestalpine conducts intensive research and development projects. Several of these projects have already been implemented.

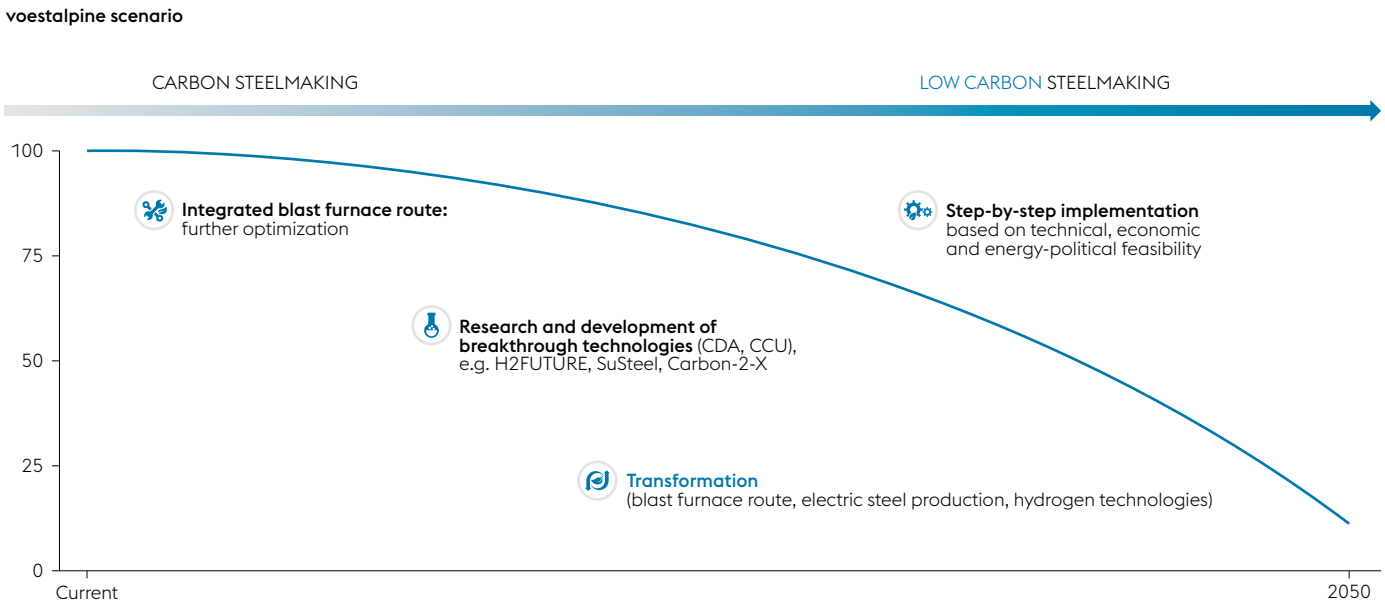
Coal and coke are fossil raw materials required in the integrated blast furnace route of steelmaking. These materials are also the main energy sources. The derived process gases are converted into electricity in our own power generation facilities. The steel production sites of voestalpine in Linz and Donawitz currently supply more than 80% of their own electrical energy in this way using highly complex internal energy cycles, which means that the sites are largely independent of external grids.

## Main challenges of decarbonization

The energy equivalent for crude steel production in Linz and Donawitz amounts to approximately 33 terawatt hours per year. The transformation to $CO_2$-minimized technologies will make it necessary to replace this energy with renewable electricity from the external grid or hydrogen produced using renewable electricity. There are many challenges for the steelmaking industry in this respect: A great deal of research and innovation investment must be made to develop new metallurgical and process technologies, and these technologies must be brought up to industrial scale. The technologies must also be based on the use of renewable energy such as green hydrogen. Unprecedented conversion investments must also be made. Finally, steelmakers must be able to operate the new production technologies in an economically competitive manner on a global scale.

While research and development lies in the metallurgical competence of the companies, the economic framework required for global implementation of new technologies can only be created through fundamental changes in the energy systems.

**LOW-CARBON STEELMAKING**



## voestalpine options and projects

voestalpine primarily pursues the concept of direct avoidance of $CO_2$ in the production process (CDA, carbon direct avoidance). The aim is to reduce $CO_2$ emissions by converting a part of our carbon-based steel production (integrated blast furnace route) into electric steel production, flexibly combining raw materials and increasing the use of hydrogen (natural gas, coke gas or pure hydrogen) and renewable energy. Depending on technical and economic availability, the proportion of hydrogen will be increased in the long term so that $CO_2$ emissions can ultimately be reduced by more than 80%.

In addition to the further optimization of the existing blast furnace route, which is only possible to a limited extent in terms of energy and emission intensity, intensive research and development projects are currently being implemented throughout the Group.

- **H2FUTURE:** Pilot plant in Linz for the production and industrial use of green hydrogen. The EU lighthouse project at the Linz site is funded by the Fuel Cells and Hydrogen Joint Undertaking (FCH JU) as part of the Horizon 2020 project.

- **SuSteel** („Sustainable Steelmaking"): This breakthrough technology is being developed in collaboration with a research facility at the Donawitz site. The aim is to produce steel directly from iron ore without any intermediate step by means of smelting reduction with hydrogen plasma. Participants include voestalpine Stahl GmbH and voestalpine Stahl Donawitz GmbH. This multi-year innovation project, which is co-sponsored by FFG, an Austrian research funding agency, is currently still only on a lab scale.

A bridge technology has been in use since October 2016: Natural gas is used as a reducing agent at the direct reduction plant of voestalpine in Texas. The natural gas can be gradually replaced with green hydrogen (produced with renewable electricity).

At voestalpine, we also focus on the possibility of carbon capture and usage (CCU). Current and future projects such as Carbon 2-X are concerned with the conversion of CO2 from process gases and the use of hydrogen in the energy and chemicals sector.

In addition to technical feasibility, the main prerequisite for both CDA and CCU is the future management of raw materials and energy (natural gas and hydrogen).


H2FUTURE
Green Hydrogen

## EU Lighthouse Project H2FUTURE, green hydrogen

**Sufficient and stable availability of green hydrogen on a large scale is one of the basic prerequisites** for the long-term development of hydrogen-based breakthrough technologies in $CO_2$-minimized steel production.

The EU lighthouse project H2FUTURE is investigating the possibility of producing green hydrogen, which is hydrogen produced using renewable electricity. The project is also researching possible applications in steel production. Central issues such as the sector coupling of energy and industry as well as the broad transferability of technologies at the EU level for the steelmaking industry as well as for other industrial sectors that could use hydrogen in their own production processes. The project is making an important contribution to the long-term decarbonization of energy-intensive industries in Europe.

At the Linz site of voestalpine, one of the world's largest pilot plants has now been built for the generation of green hydrogen with proton exchange membrane (PEM) electrolysis technology on an industrial scale with a production capacity of 1,200 $m^3$/hour and for the provision of network-related services sponsored by the fuel cells and hydrogen joint undertaking. The plant will go into operation in the fall of 2019.

The project consortium consists of Verbund, Siemens, APG, voestalpine and scientific partners K1-MET and TNO.

# MEASURES IMPLEMENTED IN THE 2018/19 ENVIRONMENTAL PROGRAM

## Excerpt of environmental measures implemented in the 2018/19 fiscal year

Essential environmental measures that have made a significant contribution to environmental performance are integral constituents of the environmental programs of companies included in the scope. The following tables document measures implemented in previous programs as well as objectives newly defined in the 2019/2020 environmental program. Further individual measures have been developed and implemented in the respective companies.

| Company | Target | Measure | Figure | Deadline |
|---|---|---|---|---|
| voestalpine Stahl GmbH | Optimized dust detection strategy and dust separation in the burdening system of blast furnace A | Installation of a new exhaust and filter system | Reduction of roughly three tons/year of diffuse dust emissions<br>Actual: Target of three tons achieved per year | 31 December 18 |
| voestalpine Stahl GmbH | Increased energy efficiency and guaranteed availability of the $DeNO_x$ plant | Preventive maintenance of plate heat exchangers | Power consumption reduced by roughly 11,500 MWh per year<br>Actual: Target achieved. Savings of roughly 12,500 MWh/year | 31 December 18 |
| voestalpine Stahl GmbH | Increased energy efficiency in Blast Furnace A | Temperature increased in the mixed blast of Blast Furnace A by partially substituting foreign coke with natural gas/blast furnace gas | Reduction of approximately 5,000 tons/year of $CO_2$<br>Actual: roughly 8,700 tons per year of $CO_2$ reduced | 31 March 19 |
| voestalpine Stahl GmbH | Minimization of (environmental) effects in the event of flooding | Optimization of flood protection | Flood protection increased to roughly HW 1,000<br>Actual: Target implemented and achieved | 31 December 20<br>Target achieved in advance |
| Steyrling location | Increased efficiency in resource utilization through reduction of dead rock | Procurement of a mobile screening unit and post-treatment of dead rock | Reduction of dead rock by roughly 4,500 tons/year through reuse of sifted-out limestone in production operations<br>Actual: roughly 11,680 tons reduced during the 2019 fiscal year | 31 March 19 |
| Steyrling location | Reduction of noise emissions through revamp of Lime Kiln 6 | Conversion of Lime Kiln 6 from corner shaft to circular shaft. Emissions are also reduced through improved port-end charging and sound insulation enclosures. | Noise emissions reduced by 11 dB(a)<br>Actual: Reduced by approximately 10 dB(a) | 31 January 19 |
| voestalpine Camtec GmbH | Resource efficiency increased by reducing material removal during processing | Design/production optimization of new generation of cam units (O-KS) | Scrap volumes reduced by roughly 30%<br>Actual: Target achieved for assemblies 1 through 3 (weight comparison of new cam units manufactured in the 2019 fiscal year with the corresponding cam units of the older generation = roughly 3 tons of cast material). Assemblies 4 through 6 still being implemented | 31 March 19 |

| Company | Target | Measure | Figure | Deadline |
|---|---|---|---|---|
| voestalpine Steel & Service Center GmbH | Conservation of resources and reduction of waste | Number of wooden bases for special pallets reduced | Reduction of 24 $m^3$/year<br>Actual: 13.4 $m^3$ achieved per year; reason: Withdrawal of quantities from affected packaging keys by automotive customers | 31 March 19 |
| voestalpine Standortservice GmbH | Optimization of track-field lighting (new installation in the railway network from the steelmaking plant to the raw material station) | Track-field lighting systems upgraded to LED technology (new installation in railway systems between the steelmaking plant and the raw material station) | Reduced electrical consumption in a portion of track-field lighting by roughly 25%<br>Actual: around 700 light points were installed as LEDs on the line between the steelworks and the raw material station, saving a total of 530,000 kWh/year | 31 March 20<br>Partial achievement |
| Logistik Service GmbH | Reduced consumption of diesel fuel on the works railway | Procurement of two new diesel locomotives with start/stop technology (series 1004.01 and .02) | Fuel savings of roughly 5,500 liters/year of diesel per locomotive = total savings of roughly 11,000 liters/year of diesel<br>Actual: Diesel fuel savings achieved of 10,450 liters/year | 31 March 19 |
| Logistik Service GmbH | Diesel fuel savings achieved in road-based vehicles required in production operations | Implementation of two new slag transporters | Savings of approximately 14,000 liters of diesel per year<br>Actual: Diesel fuel savings of 18,651 liters achieved per year | 31 March 19 |
| Cargo Service GmbH | Reduction of diesel fuel | Conversion from diesel to electric locomotive on the Steyrling–Kirchdorf route for roughly 50% of the journeys completed in the 18/19 FY | Reduction of roughly 9,250 liters of diesel per year<br>Actual: Target achieved. Reduction of 10,750 liters of diesel per year | 31 March 19 |
| voestalpine Automotive Components Linz GmbH | Laser exchange on Welding Line 6A: Optimization of energy efficiency | Replacement of $CO_2$ lasers with disk lasers | Electric consumption reduced by 270,400 MWh/year<br>Actual: Reduction achieved of 221,074 kWh/year | 31 March 19 |

# MEASURES IMPLEMENTED IN THE 2019/20 ENVIRONMENTAL PROGRAM

| Company | Target | Measure | Figure | Deadline |
|---|---|---|---|---|
| voestalpine Stahl GmbH | Coking plant: soil vapour extraction: Reduction of BTEX content in future excavated material | Remediation of Linz coking plant 076 in Linz, stage 1: Extraction of BTEX from the contaminated underground air phase in the unsaturated zone (soil extraction) | Reduction of BTEX in contaminated soil to below 50 mg/m$^3$ | 31 December 22 |
| voestalpine Stahl GmbH | Diffuse dust emissions reduced in the coke loading and unloading facility | Construction of a dust extraction and dedusting system for dust collection at transfer points and conveyor belts | Reduction of approximately 500 kg of dust per year | 31 March 20 |
| voestalpine Stahl GmbH | Increased energy efficiency through optimization of the exhaust steam pressure in the two turbines in the blast centers | Reduction and control of the condenser cooling water quantity by adapting the exhaust steam pressure from 0.09 to 0.12 bars | Blast furnace gas reduced by roughly 6,600 MWh/year and roughly 8.8 million m$^3$/year of process water | 31 March 20 |
| voestalpine Grobblech GmbH | Reduced energy consumption in heating units | Investment in a chamber furnace and optimization of the operation modes of the pusher-type furnaces (relocation of thick plating units to chamber furnace and thus optimizing the operation mode in pusher-type furnaces 1 and 2) | Natural gas consumption reduced by roughly 4,600 MWh/year and coke gas consumption by roughly 4,900 MWh/year | 31 March 20 |
| voestalpine Stahl GmbH | Energy efficiency increased by optimizing process control with regard to fuel consumption in the sintering plant | Installation of an automatic coke breeze sampling system in the mixing plant to determine grain sizes and to optimize the grain size | Reduction of approximately 1,500 tons/year of solid fuel (coke breeze) = approximately 12,000 MWh/year | 30 June 19 Extension |
| voestalpine Stahl GmbH | Reducing agent savings in 8-meter blast furnaces | Partial substitution of foreign coke by increasing the quality of our own coke | Reduction of roughly 15,000 tons/year of foreign coke and 49,000 tons/year of $CO_2$ | 31 December 19 |
| voestalpine Stahl GmbH | Reduction of cooling water | Exchange of three water-cooled steel rolls in hot-dip galvanizing line No.1 to non-cooled, full-ceramic rolls, thus eliminating energy loss to the cooling water | Cooling water reduced by roughly 150,000 cubic meters per year (roughly 4% of the annual discharge volume in Hot-dip Galvanizing Line No.1. | 31 December 19 Extension |
| voestalpine Stahl GmbH | Conservation of resources through optimized paint application in Continuous Annealing Line 2 | Development of a new coating thickness measuring method for more accurate determination of coating thicknesses | Reduction of coating requirements in C6 coatings by approximately 20% | 31 March 20 Extension |
| voestalpine Giesserei Linz GmbH | Assessment of filter dust recycling in effort to reduce landfill quantities | Discussions and test series with partner companies | 20 tons of filter dust recycled per year | 31 March 20 Extension |

# NEW MEASURES IN THE 2019/20 ENVIRONMENTAL PROGRAM

| Company | Target | Measure | Figure | Deadline |
|---|---|---|---|---|
| voestalpine Stahl GmbH | Reduction of fugitive dust emissions during the coke pressing process | Optimization of the coke cake guide carriages and improved dust collection in the coke transfer machines | Reduction of approximately six tons of dust per year | 31 March 22 |
| voestalpine Stahl GmbH | Reduced consumption of cooling water at the Linz site during the summer months as part of an experimental program | Optimized utilization of the temperature range between the Danube water inlet and the cooling water outlet in selected water lines | Result in final report on cooling water reduction in cubic meters/year | 31 December 21 |
| voestalpine Stahl GmbH | Reduction of the use of natural gas at Mixed Gas Station 1 | Gas system optimization and increased purchasing of external electric power | The reduction of natural gas by roughly 130,000 MWh/year and the increase in external power purchasing resulted in a reduction of roughly 15,000 tons of $CO_2$ per year. | 31 March 20 |
| Steyrling location | Reduction of electric power consumption in the production of quicklime | Reduction of power consumption resulting from lower furnace pressure | Reduced by roughly 940 MWh/year | 31 March 20 |
| voestalpine Grobblech GmbH | Reduced energy consumption in heating units | Increased energy efficiency through investment in a second chamber furnace and optimization of the operation modes of the pusher-type furnaces (relocation of thick plating units to chamber furnace and thus optimizing the operation mode in pusher-type furnaces 1 and 2) | Natural gas consumption reduced by roughly 4,600 MWh/year and coke gas consumption by roughly 4,900 MWh/year | 31 March 21 |
| voestalpine Giesserei Linz GmbH | Reduction of emissions in scrap processing | Optimization of the use of scrap in melting operations (reduced pre-shredding activity, shorter operating times for scrap cutting) | Reduction of dust emissions by approximately 7.2 kg/year | 31 March 20 |
| voestalpine Giesserei Traisen GmbH | Reduction of chemical consumption | Installation of a new automatic sand mixer and introduction of a sand lab with automatic dosing of binding agents | Reduction of roughly 20 tons of binding agents per year | 31 March 20 |
| voestalpine Camtec GmbH | Reduced packaging material | Reuse of wooden crates at a customer (pilot, other customers possible) | Packaging materials reduced by roughly 5–10% | 31 March 20 |
| voestalpine Steel & Service Center GmbH | Reduction of gas consumption in the shape-cutting facility | Increased energy efficiency through purchase of a new annealing furnace with better insulation and annealing dimensions | Power consumption reduced by roughly 60 MWh per year | 31 March 20 |
| Logistik Service GmbH | Reduced consumption of diesel fuel on the works railway | Procurement of two new diesel locomotives with start/stop technology (series 1004.03 and .04) | Fuel savings of roughly 5,225 liters/year of diesel per locomotive = total savings of roughly 10,450 liters/year of diesel | 31 October 19 |
| Cargo Service GmbH | Reduction of diesel fuel | Conversion from diesel to electric locomotive on the Steyrling–Kirchdorf route for roughly 100% of the journeys completed in the 2019/2020 fiscal year | Reduction of roughly 18,500 liters of diesel fuel per year | 31 March 20 |
| voestalpine Standortservice GmbH | Reduced pollutant emissions from vehicles | Continuous replacement of vehicles used by the works fire department, plant security and the Vocational Health Center by vehicles with a higher emission standard than before | Conversion to EURO 6 (4 cars) or EURO 5 (1 truck) | 30 March 20 |
| voestalpine Automotive Components Linz GmbH | Reduction of packaging material | Redesign of Jeep Compass packaging in order to reduce material consumption | Reduction of roughly 5,600 $m^2$/year Packaging film | 01 June 19 |

# PRODUCTION AND ENERGY FIGURES

The following production figures show the relevant environmental parameters for the companies included in this Environmental Report:

## Linz location

| Production volume | Unit | 2016 CY | 2017 CY | 2018 CY |
|---|---|---|---|---|
| Crude steel (CS) | Million tons | 5.29 | 5.75 | 4.62 |

| Products | Unit | 2016 CY | 2017 CY | 2018 CY |
|---|---|---|---|---|
| Hot-rolled strip (non-slit) | Million tons | 1.1 | 1.1 | 1.0 |
| Cold-rolled strip and electrical steel | | 1.002 | 1.054 | 0.908 |
| Galvanized strip | | 2.3 | 2.2 | 2.1 |
| Organic-coated strip | | 0.206 | 0.196 | 0.183 |
| Heavy plates | | 0.701 | 0.772 | 0.604 |
| Blast furnace slag | | 1.3 | 1.3 | 1.3 |
| Castings (without Camtec as of the 2017 FY) | ton | 7,444 | 6,214 | 5,912 |
| Camtec castings | | | 110.0 | 114.0 |
| Laser-welded blanks | | 129,496 | 153,903 [1] | 152,461 |
| Products processed by SSC | | 1,751,415 | 1,757,627 | 1,703,758 |

| Energy | Unit | 2016 CY | 2017 CY | 2018 CY |
|---|---|---|---|---|
| Natural gas [2] | TWh | 3.12 | 3.37 | 3.86 |
| Electric power (outside source) | TWh | 0.554 | 0.482 | 0.589 |

## Steyrling location

| Products | Unit | 2016 CY | 2017 CY | 2018 CY |
|---|---|---|---|---|
| Burned lime (BL) | Million tons | 0.373 | 0.359 | 0.287 |
| Armor stones | | 0.007 | 0.002 | 0.002 |
| Fines (unburned) | | 0.515 | 0.512 | 0.513 |
| Volume of lime stone mined (LS) | | 1.161 | 1.145 | 1.011 |

| Energy | Unit | 2016 CY | 2017 CY | 2018 CY |
|---|---|---|---|---|
| Natural gas | GWh | 362 | 342 | 282 |
| Electric power | | 16 | 15 | 11 |

## Traisen location

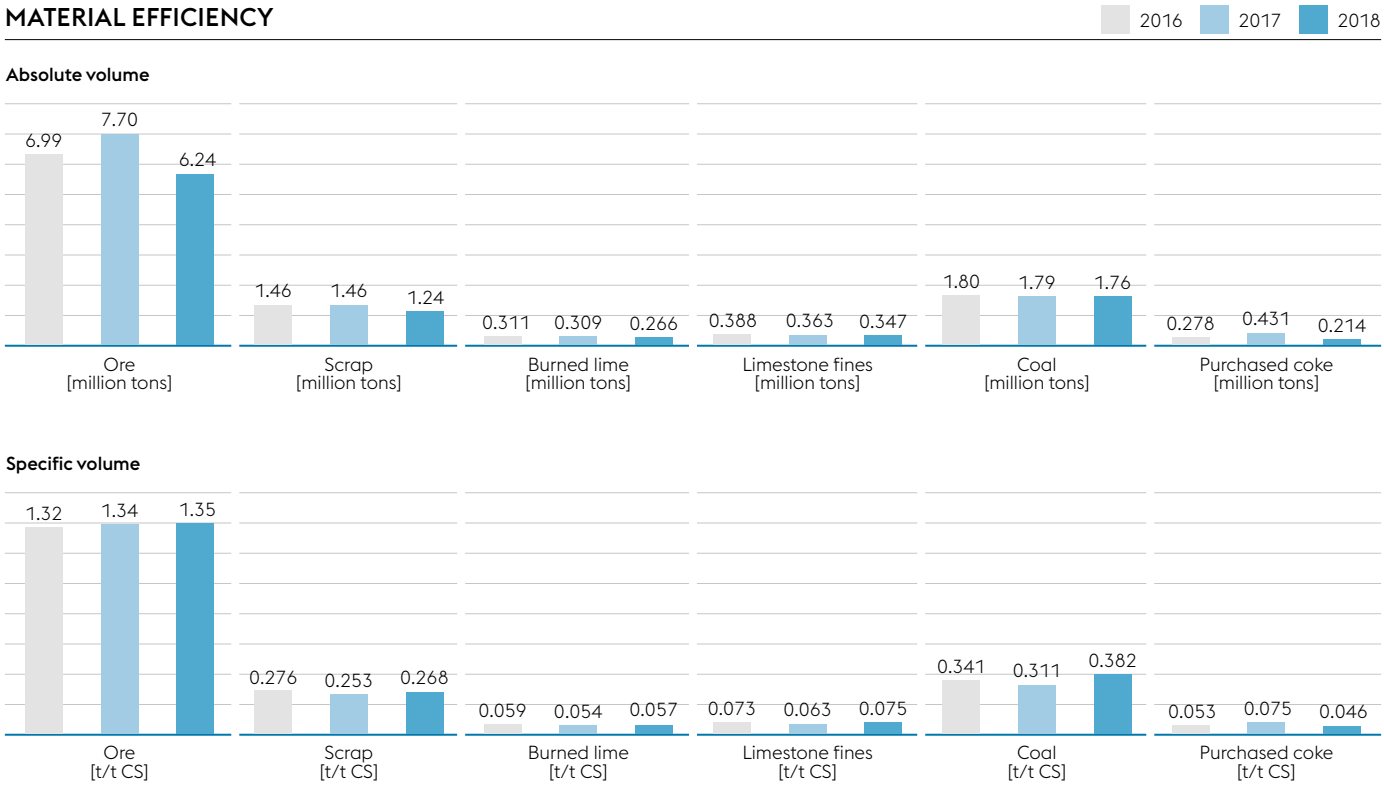
| Production volume | Unit | 2016 CY | 2017 CY | 2018 CY |
|---|---|---|---|---|
| Cast parts | ton | 8,443 | 8,016 | 8,363 |
| Cast parts | Units | 27,138 | 22,528 | 25,790 |

[1] Values updated
[2] Calculation was standardized in compliance with reporting obligations pertaining to energy monitoring (upper calorific value).

# CORE INDICATORS AT THE LINZ LOCATION

The core indicators refer to total annual crude steel production. In the 2018 calendar year, the value was 4.62 million tons. In 2016 it was 5.29 million tons, in 2017 5.75 million tons.

## MATERIAL EFFICIENCY




## ENERGY EFFICIENCY

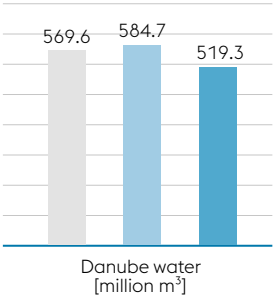

[1] Increased proportion of renewable energies with respect to electricity labeling from purchased third-party electricity. This reflects the following for the 2018 calendar year: water power (41.55%), solid biomass (3.46%), liquid biomass (0.01%), biogas (1.02%), wind energy (9.22%), photovoltaic power (1.88%), waste containing a high percentage of biogenic materials (1.57%), landfill gas (0.02%), sewage gas (0.01%) and geothermal energy (< 0.01%).

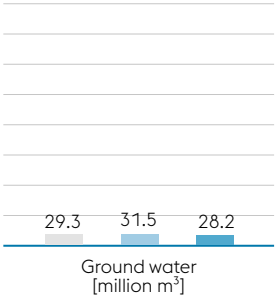
# CORE INDICATORS AT THE LINZ LOCATION

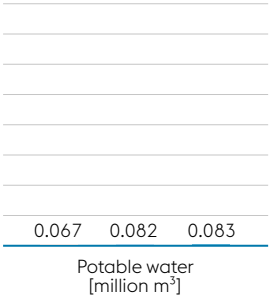
## WATER

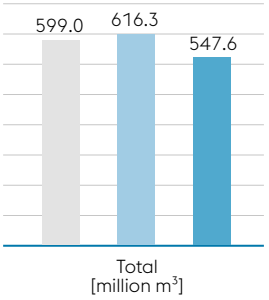
2016 2017 2018

**Absolute volume**

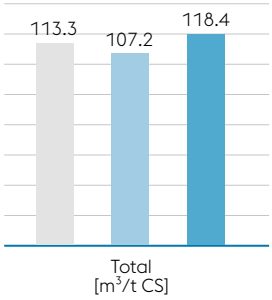


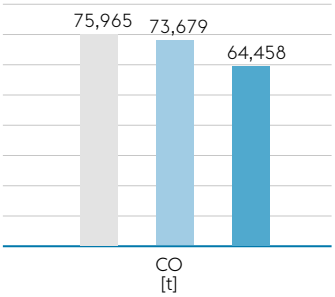



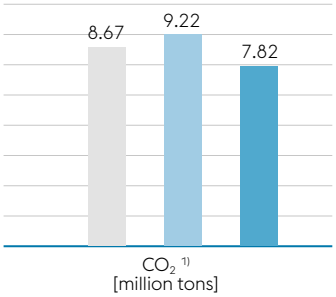

**Specific volume**

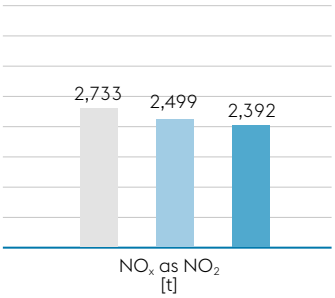


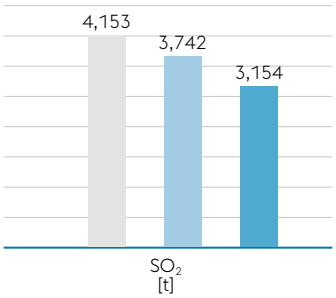

## EMISSIONS

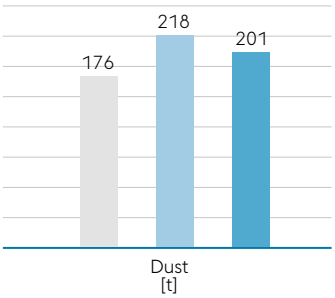
**Absolute volume**

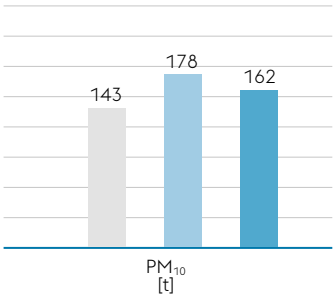


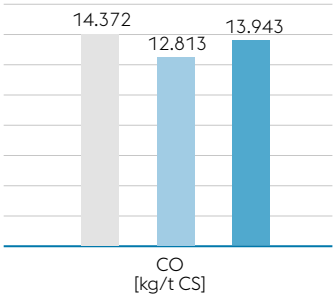



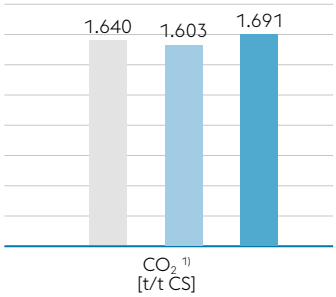



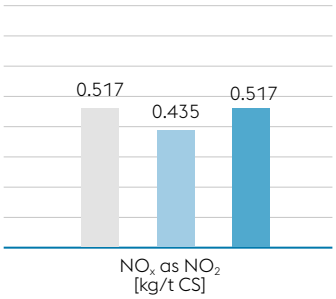



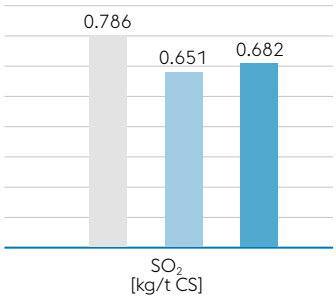



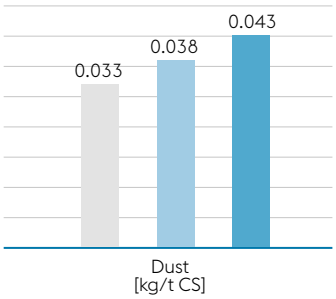

**Specific volume**

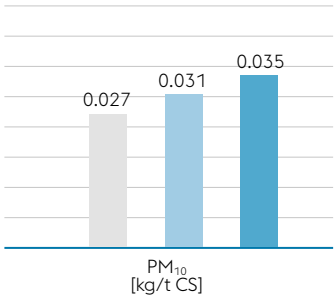



Other greenhouse gases such as methane and fluorochlorohydrocarbons (FCHC) are emitted in only small amounts (roughly 41 tons of methane and 50 kg of FCHC). [2)]

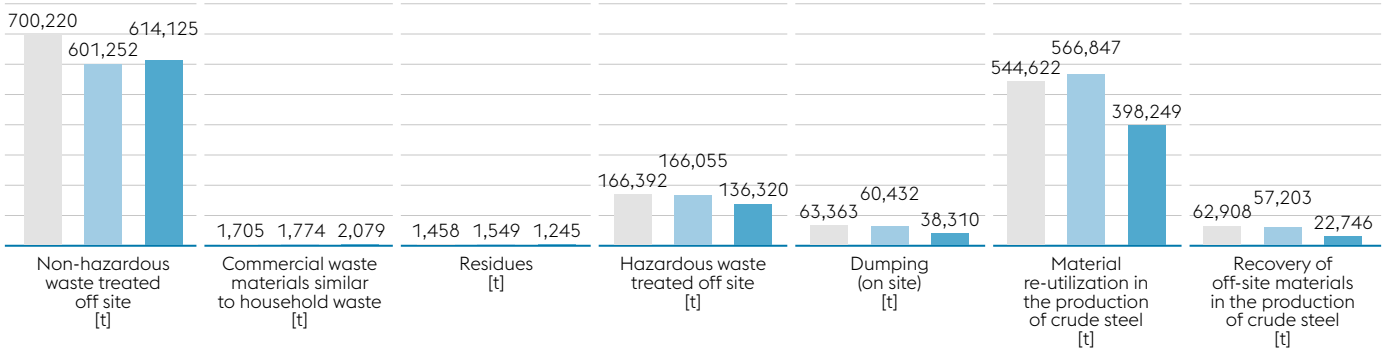
[1)] From Emission Certificate Act (ECA) monitoring

[2)] Methane emissions were almost entirely avoided at this facility during the 2018 CY after startup of the regenerative after-burning system in the coal grinding and drying plant in the fall of 2017.

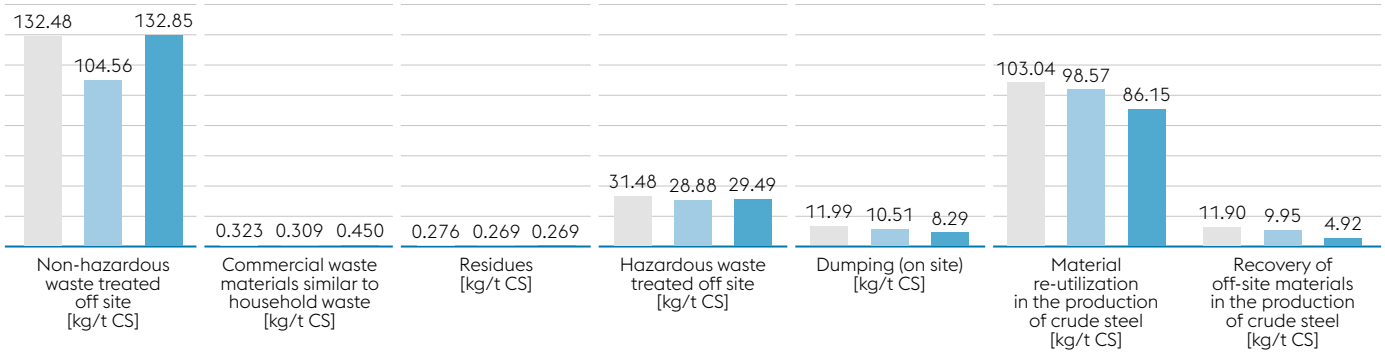
## WASTE

2016 2017 2018

**Absolute volume**

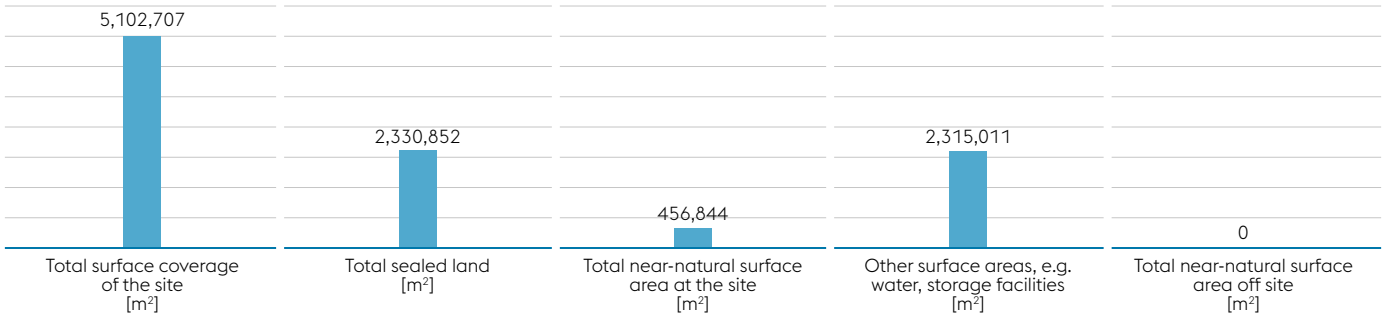



**Specific volume**




## BIOLOGICAL DIVERSITY [3)]

**Absolute volume**

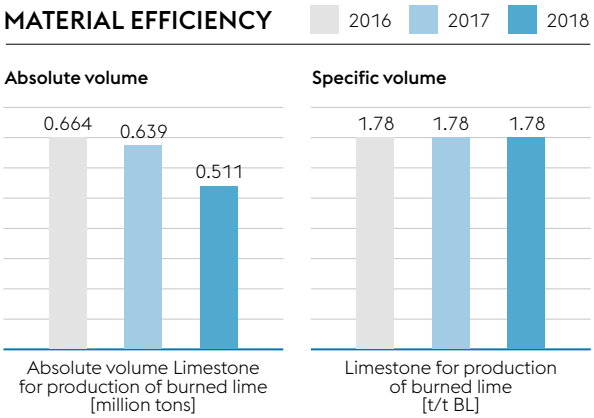



[3)] Core biological diversity indicator refers to the surface area of the works premises at the Linz location as registered in the land registry in December 2019.

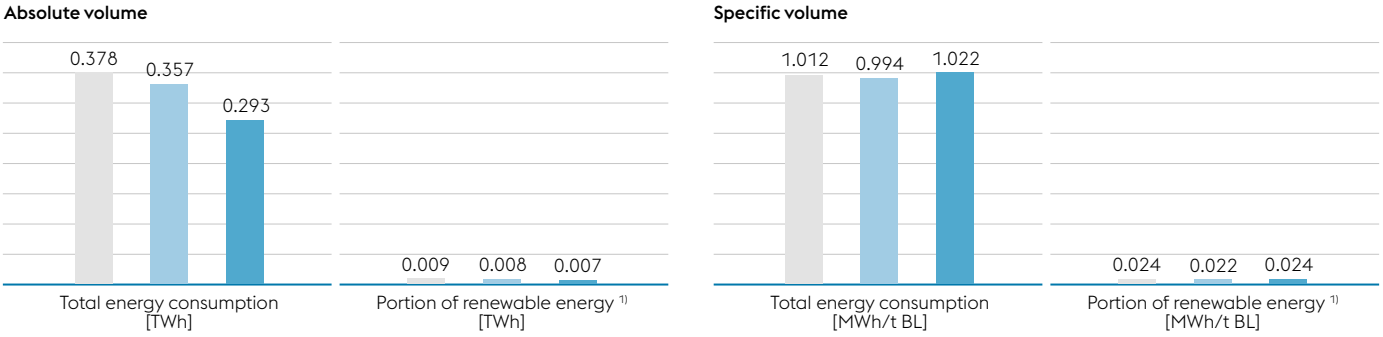
# CORE INDICATORS AT THE STEYRLING LOCATION

The core indicators refer to total annual burned lime production (BL). In the 2018 calendar year, the value was 0.29 million tons. In 2016 it was 0.373 million tons, and in 2017 0.36 million tons.

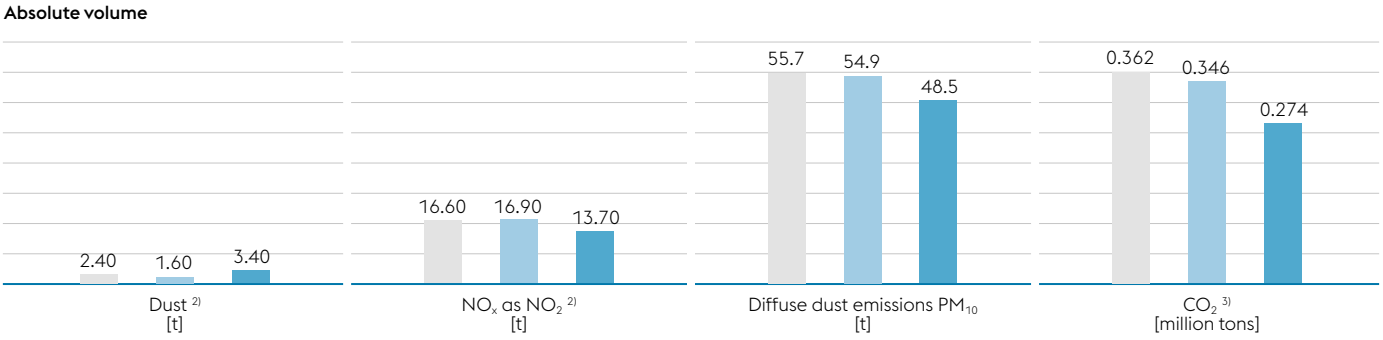
## MATERIAL EFFICIENCY

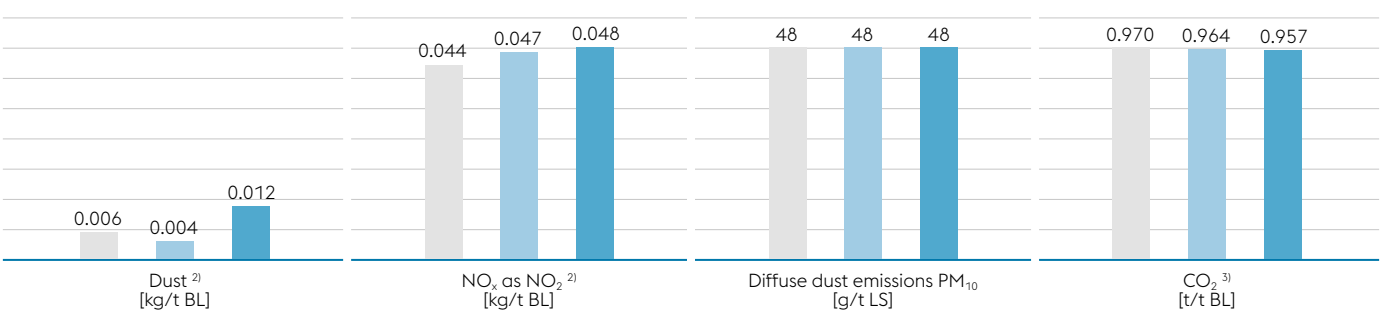



## ENERGY EFFICIENCY




## EMISSIONS



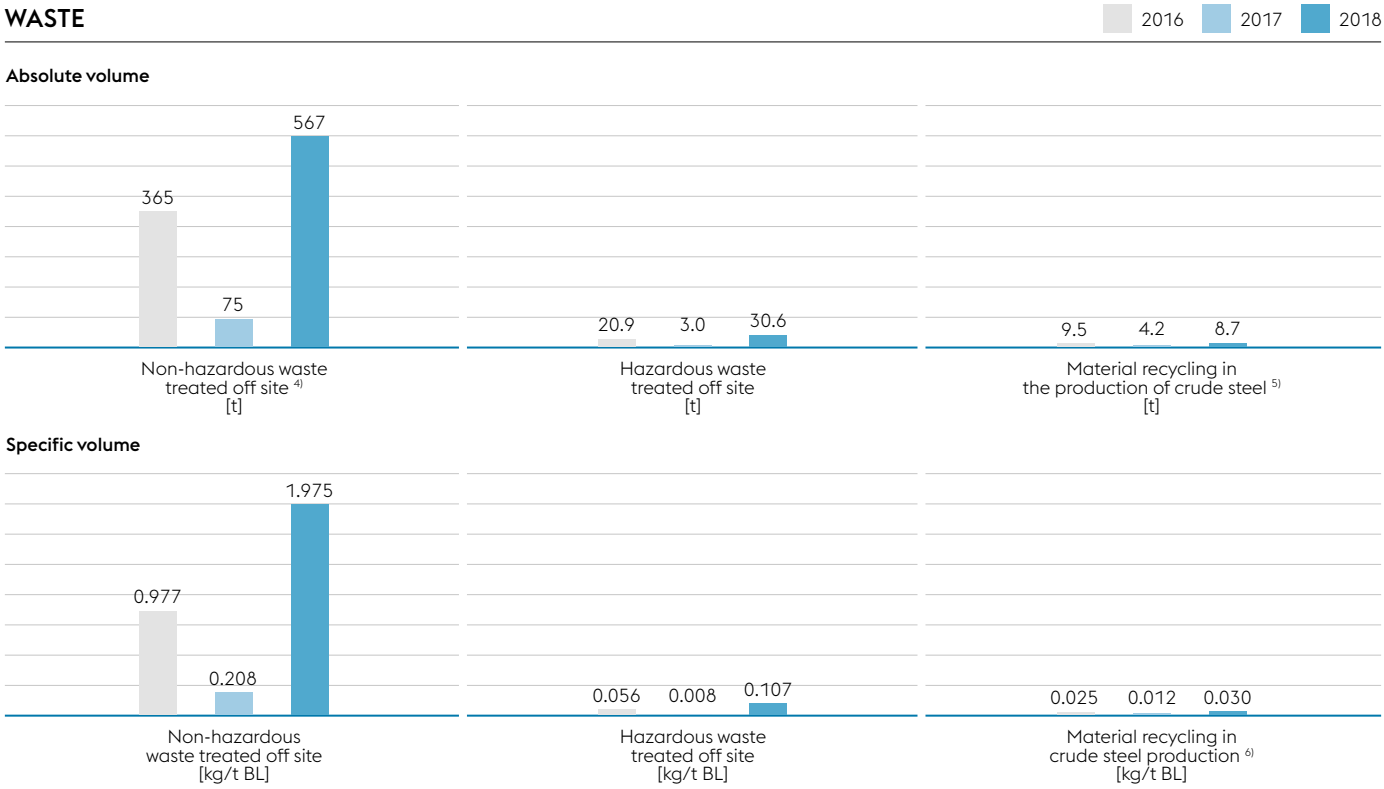




1) Increased proportion of renewable energies with respect to electricity labeling from purchased third-party electricity. This reflects the following for the 2018 calendar year: water power (41.55%), solid biomass (3.46%), liquid biomass (0.01%), biogas (1.02%), wind energy (9.22%), photovoltaic power (1.88%), waste containing a high percentage of biogenic materials (1.57%), landfill gas (0.02%), sewage gas (0.01%) and geothermal energy (< 0.01%).

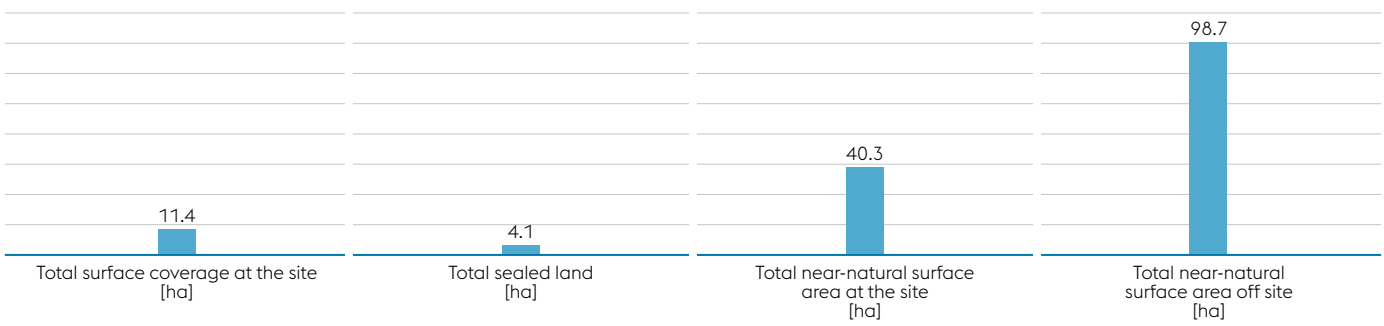
2) Emissions from lime furnaces

3) From Emission Certificate Act (ECA) monitoring

## WASTE




## BIOLOGICAL DIVERSITY [5]

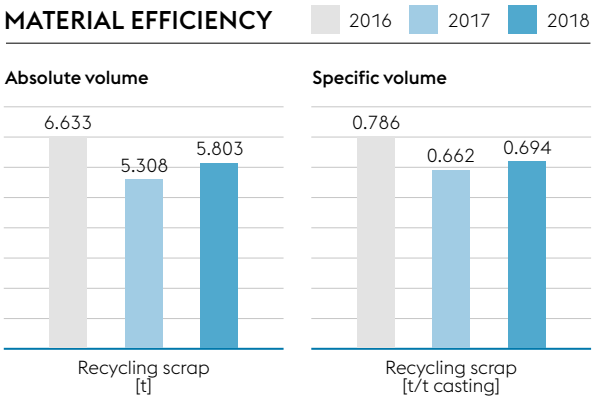



[4] Fluctuation due to construction and demolition activities
[5] Material recycling at the Linz site
[6] The core biological diversity indicator refers to the surface of the works premises at the Steyrling location as registered in the land registry in May 2019.

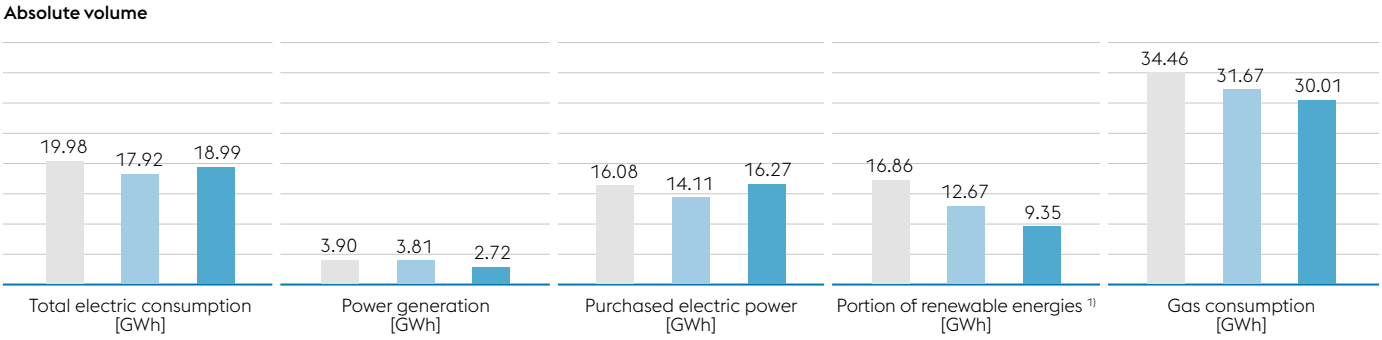
# CORE INDICATORS AT THE TRAISEN LOCATION

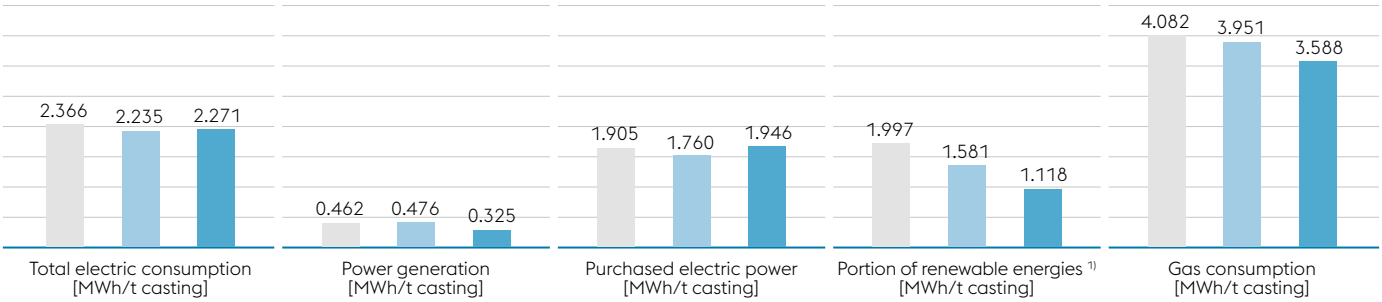
The core indicators refer to total annual casting production.
In the 2018 calendar year, the volume was 8,362 tons.
In 2016 it was 8,443 tons, 2017: 8,016 tons.

## MATERIAL EFFICIENCY

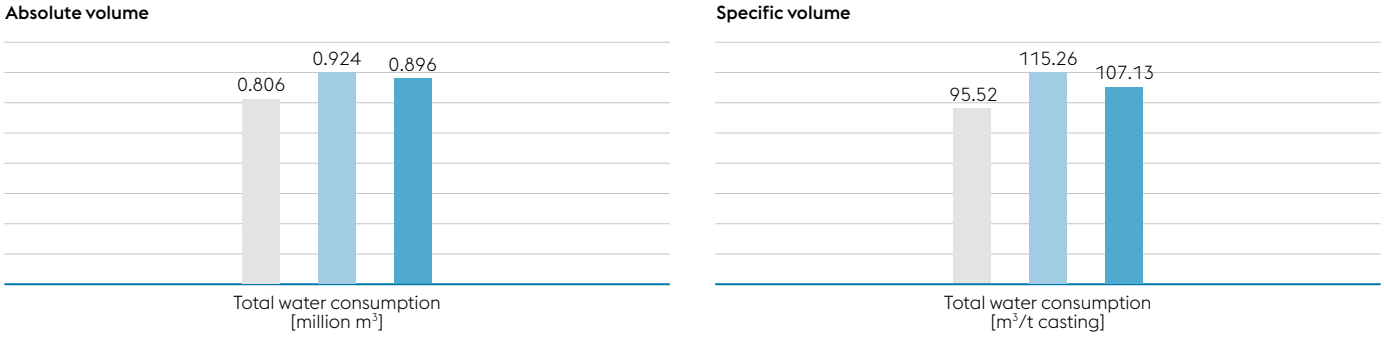



## ENERGY EFFICIENCY




## WATER

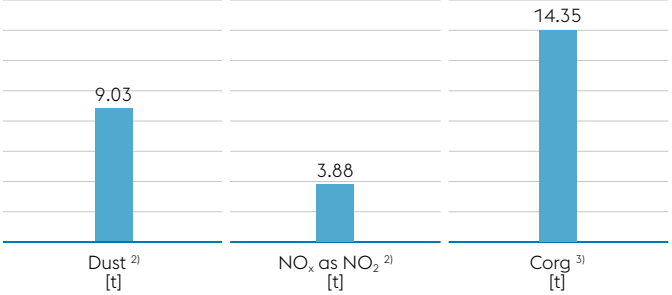



1) Determination of share of renewable energies based on official disclosure arising from purchased external electric power and electricity generated by the two hydro-power plants. During the 2018 calendar year, externally supplied electrical power was generated by water (26.94%), wind energy (8.51%), solid biomass (3.33%), photovoltaics (1.02%), other eco-energies (0.97%), coal (3.74%) and natural gas (55.50%).

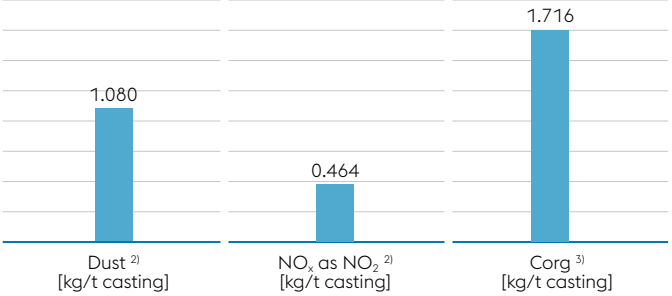
## EMISSIONS

2016 2017 2018

**Absolute volume**

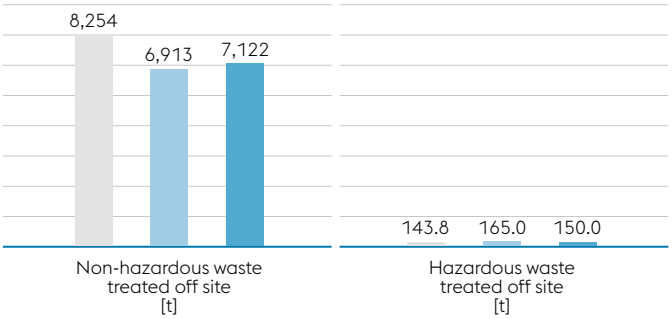



**Specific volume**

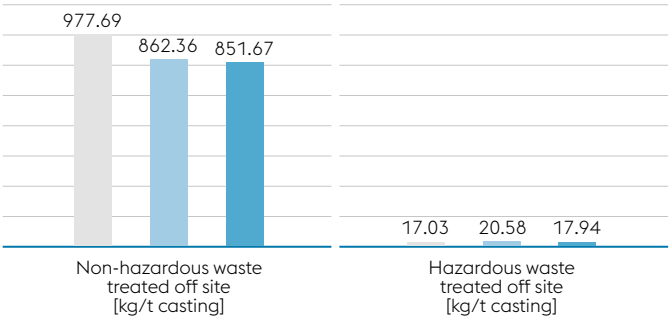



## WASTE

**Absolute volume**

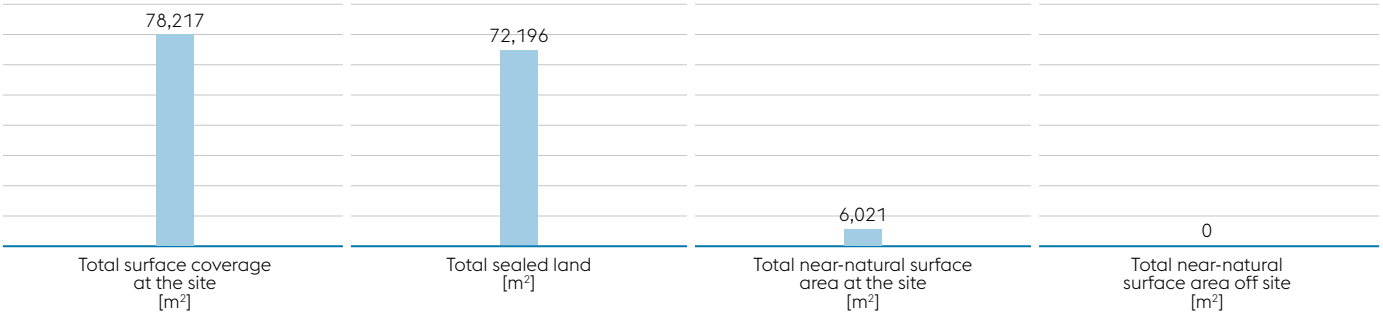



**Specific volume**




## BIOLOGICAL DIVERSITY 4)

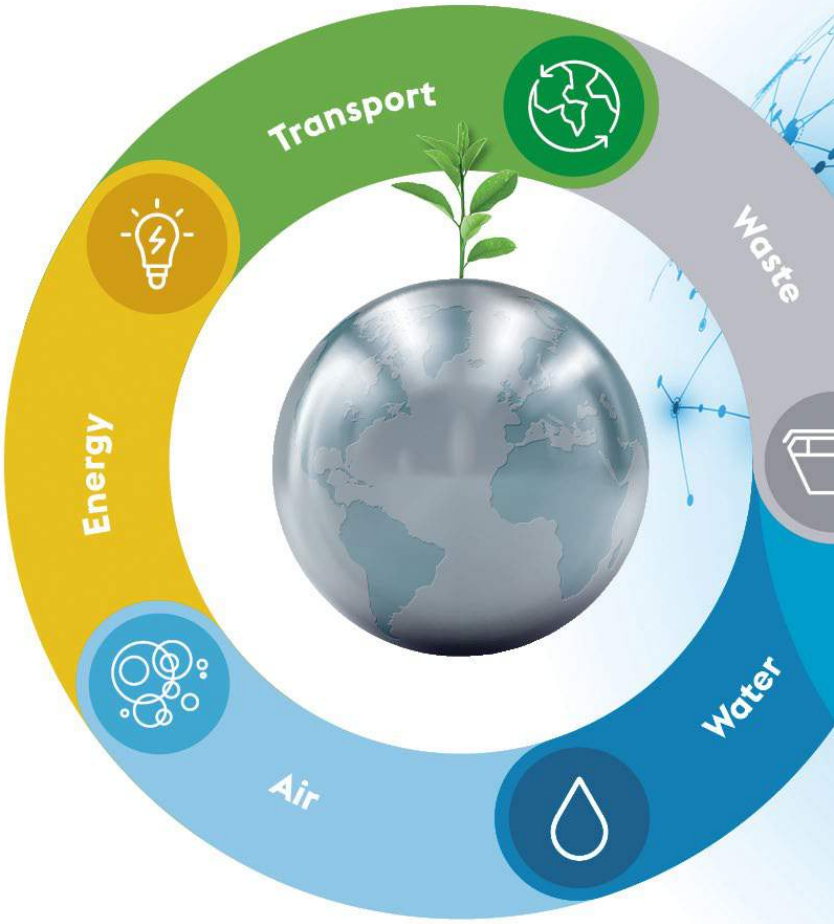
**Absolute volume**




2) Emissions from production systems
3) From annealing furnace/bogie hearth furnace
4) The core biological diversity indicator refers to the surface area of the works premises at the Traisen location as registered in the land registry in February 2019.

# CIRCULAR ECONOMY
# BY voestalpine

**Versatile, durable and environmentally friendly, steel is the material of the future.**




Steel is durable, easy to repair and can always be recycled into new steel products. The unique properties of steel, such as product weight reduction, durability and processability, make it the number-one material of the future and indispensable in a wide variety of industries.

STEEL MEETS ALL THE REQUIREMENTS OF A FUTURE CIRCULAR ECONOMY.


**Reduce.** Product weight and the amount of material used can be reduced by using modern steel grades.

**Reuse.** The longevity and durability of steel allows continuous reuse of products.

**Repair.** Because to their manufacturing properties, steel products can be remanufactured or repaired for different purposes using various manufacturing techniques.

**Recycle.** Steel products can be recycled in a closed loop over and over again into new steel products.

**The circular economy has long been implemented in many areas at voestalpine**

and is being further developed on a continual basis.

At the political level, the term stands for an ambitious package of measures and legislation adapted and published by the European Union Commission in 2015 to take into account the growing importance of this approach in our society as well as in the European and global economies.

This includes all phases of value creation (the entire lifecycle) from production, use and consumption to end of life (waste management and loop closure) and the creation and further development of markets for secondary raw materials. All these measures are intended to foster development in Europe toward a circular economy, strengthen global competitiveness and promote sustainable economic growth.

The concept of a circular economy aims at developing and closing material cycles and value chains:

- Maintain added value of the products by using them for as long as possible
- Keep substances and materials available in the overall system by closing the loop and making them available again as secondary raw materials in order to preserve their value

This minimizes waste (towards ZERO WASTE) and increases resource and energy efficiency.

Steel products contribute to the progress our circular economy because modern steels can reduce the amount of materials used in products (reduce), steel products can be reused because of their durability and longevity (reuse) and can be repaired using a variety of different manufacturing techniques (repair/re-manufacture). Steel products can always be recycled in a closed loop to make new steel products.

In a circular economy, a fundamental aspect of product assessment is a holistic view that takes into account ecological, social and economic factors throughout the entire lifecycle of the product.

Product sustainability encompasses all three pillars of sustainability along the entire supply and value chain. At present, the focus is on environmental aspects.

Life cycle assessment (LCA) is the method used to systematically assess the environmental impacts of products throughout their entire lifecycle. Several impact categories are considered, including carbon footprint ($CO_2$), acidification potential ($SO_2$, $NO_x$), primary energy demand and much more.

This holistic view within the system boundaries is necessary in order to transparently and objectively identify burden shifting in the environmental impact between lifecycle phases or between different impact categories.

Environmental product declarations (EPDs) are an important tool for providing transparent and neutral information

on the environmental impact of products based on a life cycle assessment. voestalpine has developed and published EPDs for various products such as colofer®, hot-dip galvanized steel strip, heavy plate, roll-bonded clad plates and rails.

EPDs are based on the EN15804 and ISO14025 standards, are third-party verified by independent auditors and are published as part of the declaration program of the Institut Bauen und Umwelt (IBU) in Berlin.

voestalpine also assesses the water footprint for the Linz site based on holistic methods.

Material cycles can only be developed and the loop closed if the products do not contain substances that inhibit or counteract the closure of a loop. A corresponding legal framework governs the handling of such substances as well as the reporting obligations and verifying.

These include REACH (Registration, Evaluation, Authorization and Restriction of Chemicals), RoHS (Restriction of Hazardous Substances) and the directive on end-of-life vehicles. The products of the voestalpine Steel Division meet all pertinent requirements (material compliance).

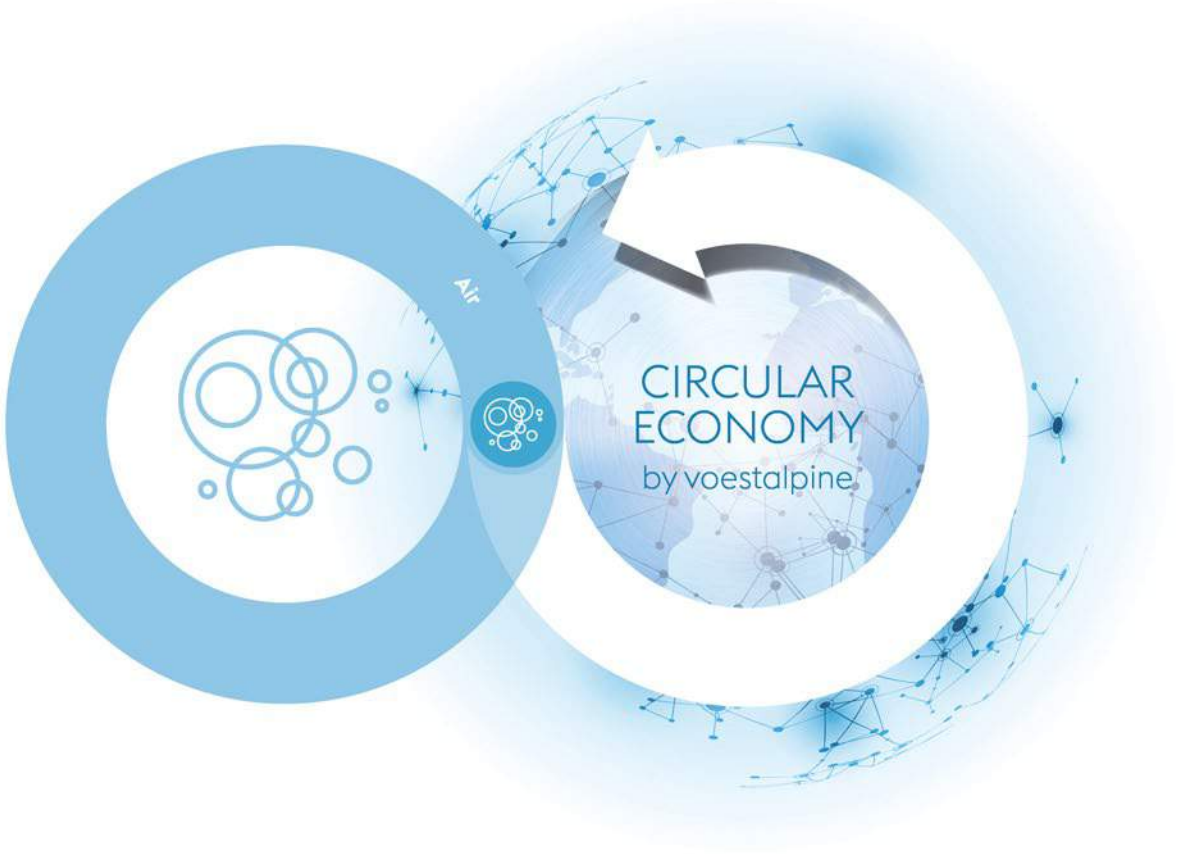
The circular economy concept with development and material loop closure as well as material and value creation cycles to increase resource and energy efficiency is implemented in the Linz-site manufacturing processes of voestalpine. Waste and circulating materials from steel production as well as waste and secondary raw materials from external production processes are used in the production processes at the Linz site. Additionally, material cycles (product and secondary raw materials) in the supply chain are established and promoted.

The establishment and expansion of so-called industrial symbioses, for example the use of by-products from steelmaking processes as secondary raw materials for the production of products in other industrial sectors, contribute to the further development of the circular economy. These industrial symbioses include, for example, the use of granulated blast furnace slag as an additive in cement production, the use of coal by-products from the coking process in the chemical industry and regeneration products such as iron oxide for the production of components in electronics and electrical applications.

Circular economy is not a theoretical approach at voestalpine. The steel products made by voestalpine are versatile, durable and sustainable, and the production processes at the Linz site are optimized on a continual basis to further increase resource and energy efficiency. voestalpine is an integral part of the circular economy along the entire value chain.

# ENVIRONMENTAL FOCUS ON AIR

**The reduction of emissions is an essential target.
The results are very favorable.**




# -95%

A savings of 95% dust per ton of crude steel is only one of the many values that voestalpine substantially improved. The reduction of specific emissions at the Linz site is impressive. Since the mid 1980s, $SO_2$ and $NO_x$ have also been reduced by 75%, and $CO_2$ by roughly 20%.

**Reduce.** Process-integrated measures, e.g. new burner technologies

**Reuse.** Circulation in dust management, e.g. zinc in the LD3 steelmaking plant, or of activated carbon and sodium bicarbonate in the sintering plant

**Repair.** Coal grinding and drying plant with post-combustion, filter bag exchange, regular cleaning of $DeNO_x$ (heat plate exchangers), end-of-pipe technologies

**Recycle.** Reuse of the casting hall dust in the sintering plant

**Implementing best available technologies takes a high priority at the Linz location in order to avoid or reduce emissions.**
More than 70% of the emissions are continuously measured and are transmitted online to the local environmental authorities. The remaining emissions are assessed in compliance with official requirements in prescribed intervals.

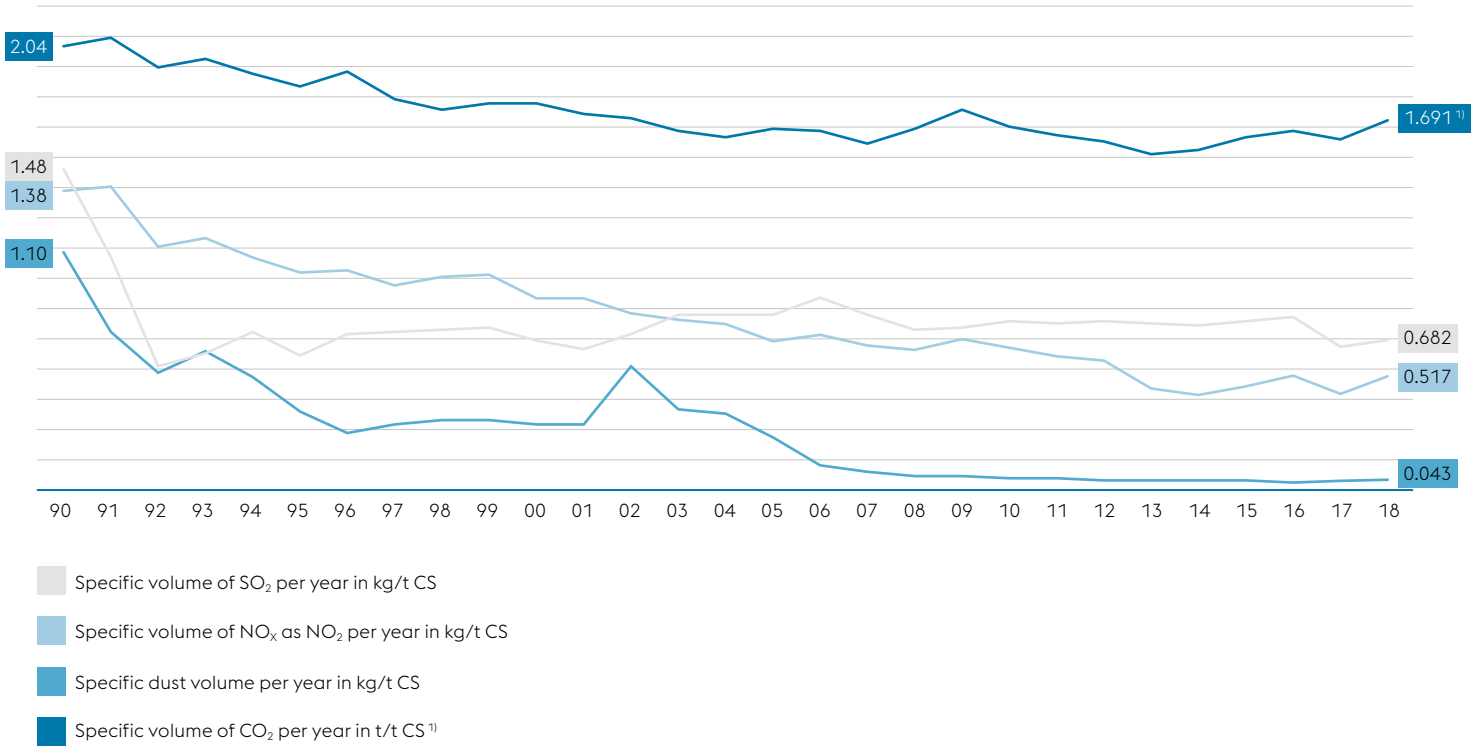
The emissions from lime extraction at the Steyrling location during the 2018 reporting year were minimal as compared to the previous year. Activities involving particularly large amounts of dust, such as blasting, take weather conditions into account.

The voestalpine foundry at the Traisen site takes effective air pollution control measures to sustainably improve the air quality, meet legal obligations and pursue its own interests. The best available technologies are implemented to achieve the best results.

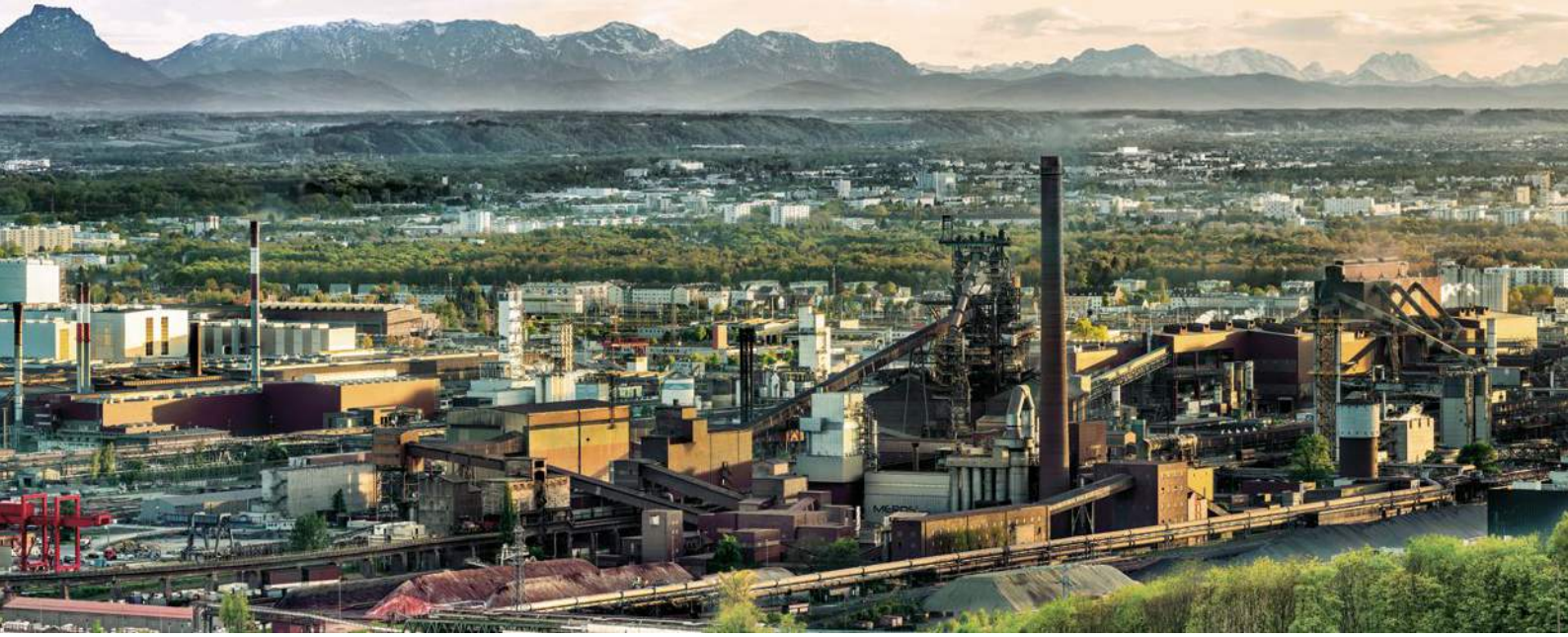
**Specific air emissions**
Continual further development of production processes and the implementation of numerous air-pollution-control measures have led to a significant reduction in emissions.

## EMISSIONS REDUCTION AT THE LINZ LOCATION

**Per ton of crude steel since the mid 1980s**




1) According to EZG-2011 as amended



# Continuous emission measurements at the Linz site

| $NO_x$ as $NO_2$ | Production line | Half-hour average value ($mg/m_n^3$) | Measured annual average value ($mg/m_n^3$) | | |
|---|---|---|---|---|---|
| | | Limit value | 2016 CY | 2017 CY | 2018 CY |
| Power station | Block 06 | 100 | 84 | 77 | 66 |
| | Block 03 | 100 | 59 | 48 | 46 |
| | Block 04 | 100 | 42 | 38 | 46 |
| | Block 05 | 100 | 56 | 45 | 42 |
| | Block 07 | 100 | 46 | 38 | 42 |
| | Gas and steam turbine | 33 | 24 | 27 | 25 |
| Blast furnace blower station | Central blower station 2, boiler 1 | 100 | 6 | 3 | 7 |
| | Central blower station 2, boiler 2 | 100 | 5 | 6 | 5 |
| Hot-rolling mill | Pusher-type furnace 06 | 430 | 273 | 274 | 270 |
| | Pusher-type furnace 07 | 430 | 197 | 191 | 199 |
| | Walking-beam furnace 1 | [1] | 105 | 86 | 115 |
| Sintering plant | Sinter belt 5 | 150 [2] | 89 | 88 | 85 |
| Cold-rolling mill | Hot-dip galvanizing line III | 250 | 134 | 141 | 148 |
| | Hot-dip galvanizing line IV | 250 | 108 | 102 | 94 |
| | Hot-dip galvanizing line V | 250 | 106 | 140 | 153 |
| Heavy plates | Pusher-type furnace 1 | 500 | 339 | 331 | 370 |
| | Pusher-type furnace 2 | [1] | 177 | 163 | 167 |

| $SO_2$ | Production line | Half-hour average value ($mg/m_n^3$) | Measured annual average value ($mg/m_n^3$) | | |
|---|---|---|---|---|---|
| | | Limit value | 2016 CY | 2017 CY | 2018 CY |
| Power station | Block 06 | 200 | 88 | 61 | 63 |
| | Block 03 | 200 | 97 | 81 | 89 |
| | Block 04 | 200 | 102 | 88 | 89 |
| | Block 05 | 200 | 88 | 78 | 91 |
| | Block 07 | 200 | 100 | 85 | 94 |
| | Gas and steam turbine | 67 | 30 | 31 | 29 |
| Blast furnace | Casting bay dedusting (BF A) | 350 | 108 | 93 | 88 |
| LD steelmaking plant | Secondary dedusting 1 | 101,5 [3] | 28 | 18 | 21 |
| Hot-rolling mill | Pusher-type furnace 06 | 200 | 112 | 113 | 114 |
| | Pusher-type furnace 07 | 200 | 49 | 47 | 49 |
| Coking plant | Sulfuric acid and gas cleaning system | 1000 [4] | 371 | 370 | 393 |
| Sintering plant | Sinter belt 5 | 350 | 298 | 289 | 269 |
| Heavy plates | Pusher-type furnace 1 | 200 | 104 | 103 | 111 |

All emission sources are continuously monitored. The data refer to the respective calendar year.

[1] The limit value is defined in the course of the acceptance test.

[2] Sinter Belt No. 5: additional limitation of daily mean values for $NO_x$ of 100 $mg/m_n^3$.

[3] $SO_2$ limit values in kg/h.

[4] There is also a fraction limit value of 150 kg $SO_2$/day under normal operating conditions.

## CO

| | Production line | Half-hour average value ($mg/m_n^3$) | Measured annual average value ($mg/m_n^3$) | | |
|---|---|---|---|---|---|
| | | Limit value | 2016 CY | 2017 CY | 2018 CY |
| Power station | Block 03 | 100 | 1.7 | 0.7 | 5.9 |
| | Block 04 | 80 | 2.1 | 3.9 | 5.6 |
| | Block 05 | 80 | 2.3 | 2.4 | 7.1 |
| | Block 07 | 80 | 0.4 | 0.8 | 9.1 |
| | Gas and steam turbine | 33 | 1.4 | 2.0 | 2.8 |
| Blast furnace | Central blower station 2. boiler 1 | 80 | 0.1 | 0.6 | 1.3 |
| | Central blower station 2. boiler 2 | 80 | 3.0 | <0.1 | 3.2 |
| Coil coating line | Strip coating line 1 | 100 | 3.9 | 4.6 | 0.5 |
| | Strip coating line 2 | 100 | 7.4 | 8.1 | 6.1 |

## Total carbon

| | Production line | Half-hour average value ($mg/m_n^3$) | Measured annual average value ($mg/m_n^3$) | | |
|---|---|---|---|---|---|
| | | Limit value | 2016 CY | 2017 CY | 2018 CY |
| Coil coating line | Strip coating line 1 | 30 | 2.5 | 2.4 | 1.2 |
| | Strip coating line 2 | 30 | 4.9 | 3.7 | 3.1 |

## $H_2S$ [1)]

| | Production line | Half-hour average value ($mg/m_n^3$) | Measured annual average value ($mg/m_n^3$) | | |
|---|---|---|---|---|---|
| | | Limit value | 2016 CY | 2017 CY | 2018 CY |
| Coking plant | | 500 | 230 | 228 | 250 |

## HF

| | Production line | Half-hour average value ($mg/m_n^3$) | Measured annual average value ($mg/m_n^3$) | | |
|---|---|---|---|---|---|
| | | Limit value | 2016 CY | 2017 CY | 2018 CY |
| Sintering plant | Sinter belt 5 | 3.0 | 1.1 | 1.4 | 1.5 |

## Hg

| | Production line | Half-hour average value ($mg/m_n^3$) | Measured annual average value ($mg/m_n^3$) | | |
|---|---|---|---|---|---|
| | | Limit value | 2016 CY | 2017 CY | 2018 CY |
| Sintering plant | Sinter belt 5 | 0.050 | 0.040 | 0.042 | 0.042 |

## Dust

| | Production line | Half-hour average value ($mg/m_n^3$) | Measured annual average value ($mg/m_n^3$) | | |
|---|---|---|---|---|---|
| | | Limit value | 2016 CY | 2017 CY | 2018 CY |
| Blast furnace | Casting bay dedusting (BF A) | 15 | 4.6 | 5.6 | 5.3 |
| | Casting bay dedusting system (BF 5 and 6) | 10 | 1.8 | 1.6 | 1.6 |
| Sintering plant | Sinter belt 5 | 10 | 1.6 | 2.5 | 2.4 |
| | Sinter plant dedusting | 10 | 5.4 | 4.7 | 4.3 |
| | Sinter crusher and screening unit (SIBUS) | 10 | 1.1 | 1.5 | 1.5 |
| LD steelmaking plant | Secondary dedusting 1 | 10 | 0.5 | 4.3 | 5.6 |
| | Secondary dedusting 2.1 | 10 | 2.3 | 3.0 | 2.7 |
| | Secondary dedusting 2.2 | 10 | 0.4 | 1.2 | 1.0 |
| | Secondary dedusting 3.1 | 10 | 0.04 | 0.1 | 0.1 |

The emission concentrations listed in this table refer to the legally prescribed oxygen content, (e.g. emission protection law on boiler plant systems, directive on iron and steel).

All emission sources are continuously monitored. The data refer to the respective calendar year.

[1)] $H_2S$ is contained in the coke gas that is energetically utilized in other process steps. Emissions only occur in the form of $SO_2$.

# Emission measurements at the Steyrling location

| $NO_x$ as $NO_2$ | Production line | Limit value ($mg/m_n^3$) | Measured value ($mg/m_n^3$) | | |
|---|---|---|---|---|---|
| | | | 2016 CY | 2017 CY | 2018 CY |
| Steyrling Lime Plant | Furnace 4 | 300 | 12.1 | 12.6 | 16.5 |
| | Furnace 5 | 300 | 13.2 | 12.5 | 16.0 |
| | Furnace 6 | 300 | 28.9 | 27.3 | [1] |
| | Furnace 7 | 300 | 19.9 | 19.8 | 24.3 |

| CO | Production line | Limit value ($mg/m_n^3$) | Measured value ($mg/m_n^3$) | | |
|---|---|---|---|---|---|
| | | | 2016 CY | 2017 CY | 2018 CY |
| Steyrling Lime Plant | Furnace 4 | 150 | 6.7 | 4.1 | 9.2 |
| | Furnace 5 | 150 | 16.0 | 14.1 | 9.1 |
| | Furnace 6 | 150 | 10.7 | 5.4 | [1] |
| | Furnace 7 | 150 | 14.8 | 12.5 | 12.8 |

| Dust | Production line | Limit value ($mg/m_n^3$) | Measured value ($mg/m_n^3$) | | |
|---|---|---|---|---|---|
| | | | 2016 CY | 2017 CY | 2018 CY |
| Steyrling Lime Plant | Furnace 4 | 10 | 1.0 | 2.9 | 6.2 |
| | Furnace 5 | 10 | 1.0 | 1.1 | 8.2 |
| | Furnace 6 | 10 | 6.0 | 1.9 | [1] |
| | Furnace 7 | 10 | 2.8 | 1.7 | 2.9 |
| | | | | | |
| | Furnace discharge 4 | 10 | 2.4 | [2] | [2] |
| | Furnace discharge 5 | 10 | 3.5 | [2] | [2] |
| | Furnace discharge 6 | 10 | 1.0 | [2] | [2] |
| | Furnace discharge 7 | 10 | 0.2 | [2] | [2] |
| | | | | | |
| | Lime extraction | 10 | 1.7 | [2] | [2] |
| | Lime loading | 10 | 1.6 | [2] | [2] |

[1] Standstill for conversion of lime furnace 6 to a circular shaft furnace, no measurements taken
[2] Measuring interval every 3 years, next measurement in the 2019 CY

# Emission measurements at the Traisen site

## Dust

| | Production line | Limit value ($mg/m_n^3$) | Measured value ($mg/m_n^3$) Most recent measurement in the 2018 CY [1] |
|---|---|---|---|
| | | | 2018 CY |
| voestalpine Giesserei Traisen GmbH | Dedusting in the melting plant | 10 | < 1 |
| | Mixer 1, molding line | 10 | 9.5 |
| | AAF Bay 3 | 10 | 4.5 |

## $NO_x$ as $NO_2$

| | Production line | Limit value ($mg/m_n^3$) | Measured value ($mg/m_n^3$) Most recent measurement in the 2018 CY [1] |
|---|---|---|---|
| | | | 2018 CY |
| voestalpine Giesserei Traisen GmbH | Annealing furnace 6 | 350 (at < 800 °C) | 317 |
| | Annealing furnace 7 | 350 (at < 800 °C) | 193 |
| | Annealing furnace 9 | 350 (at < 800 °C) | 115 |

## C.org

| | Production line | Limit value ($mg/m_n^3$) | Measured value ($mg/m_n^3$) Most recent measurement in the 2018 CY [1] |
|---|---|---|---|
| | | | 2018 CY |
| voestalpine Giesserei Traisen GmbH | Dedusting in the melting plant | 50 | 7 |
| | Mixer 1, molding line | 20 (materials of Class 1) | < 0.1 |
| | | 100 (materials of Class 2) | 44 [2] |
| | | 150 (materials of Class 3) | 44 [2] |
| | AAF Bay 3 | 20 (materials of Class 1) | 9 [3] |
| | | 100 (materials of Class 2) | 9 [3] |
| | | 150 (materials of Class 3) | 9 [3] |

[1] Measurement interval every 3 years, next measurement in the 2021 CY
[2] Total organic carbon (Class 2 + Class 3)
[3] Total organic carbon (Class 1 + Class 2 + Class 3)

# ENVIRONMENTAL FOCUS ON ENERGY

**Sustainable management of energy resources is an essential principle at voestalpine.**


# >15%

By optimizing production processes and cascading the energy used, specific energy consumption at the Linz site has been reduced by more than 15% over the past 20 years.

At the Linz site, 75% of the electrical energy is generated by the company itself.

**Reduce.** Optimization of steam generation and thermal processes as well as reduced loss of compressed air

**Reuse.** Energetic utilization of co-products (gases generated during steel production)

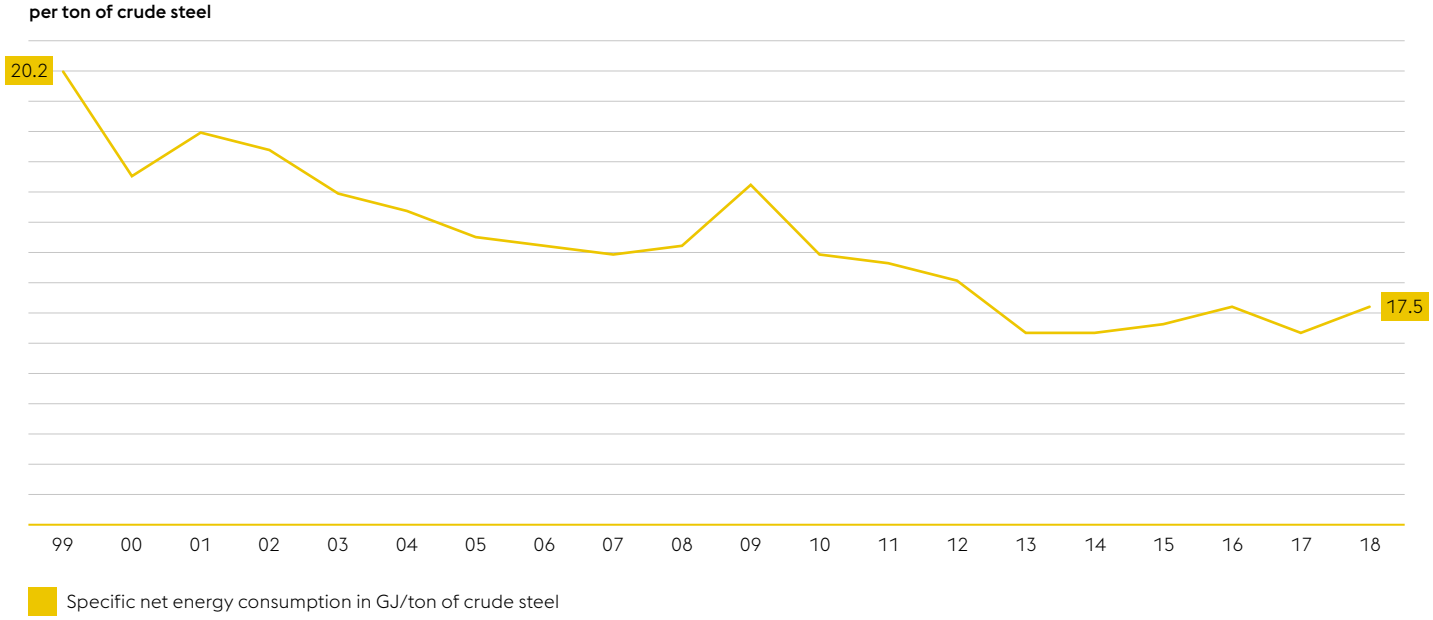
**Repair.** Energy recovery through blast furnace gas expansion turbine

**Recycle.** Injection of used plastics as a substitute for fossil fuels

In our efficient use of energy, we also focus on optimization of process gas utilization and energy recovery. Consistent energy monitoring and continuous plant system optimization for increased overall energy efficiency

The voestalpine foundry in Traisen ensures that materials and energy are used in an environmentally friendly and resource-conserving manner in all production cycles. We continually surmount new challenges and implement new standards in order to live up to our social responsibility.

## NET ENERGY CONSUMPTION




Specific energy consumption was substantially reduced over the past twenty years. Approximately 75% of the electric power consumed at the Linz site is produced on location.

The energy required in steelmaking is derived primarily from coal, coke, natural gas and electricity. Process gases (coke-oven gas, blast-furnace gas and converter gas) generated in the making of steel are used as energy-transfer media either directly or by efficiently converting the gases into heat or electrical energy in individual process steps.

The active contributions of each employee to environmental protection and energy savings are of great value. Many projects, large and small, are continually being planned and implemented.

The spectrum ranges from small projects to large, industrial-scale programs such as the optimization of steam generation, reduced loss of compressed air and the optimization of thermal processes. These and many other measures saved more than 70,000 MWh during the 2018 calendar year.

# ENVIRONMENTAL FOCUS ON WATER

**In tune with nature.**


# 89%

Total water consumption at the Linz site amounted in 2018 to around 548 million cubic meters, of which 89.3%—a total of 489 million cubic meters—was used as cooling water and returned to Danube or Traun rivers without any pollution.

**Reduce.** Cooling process optimization, e.g. sludge from water treatment systems

**Reuse.** Cooling towers, 95% circulation; LD3 water treatment

**Repair.** Seepage pits at the Linz location

**Recycle.** Reuse of cooling water in the recycling center, wet granulation

Water is one of the most important operating supplies. It is needed to cool plant systems and to create steam in iron and steel production.

A total of 548 million cubic meters of water were pumped from the Danube in the 2018 calendar year at the Linz site. This cooling water is channeled back into the Danube in compliance with the defined temperature limit values. Depending on the wastewater constituents, was either cleaned before returning it to the Danube or was piped to the municipal waste water treatment plant in Asten for biological treatment.

The sustainable management of water resources, particularly in compliance with local conditions, is an essential priority of voestalpine.

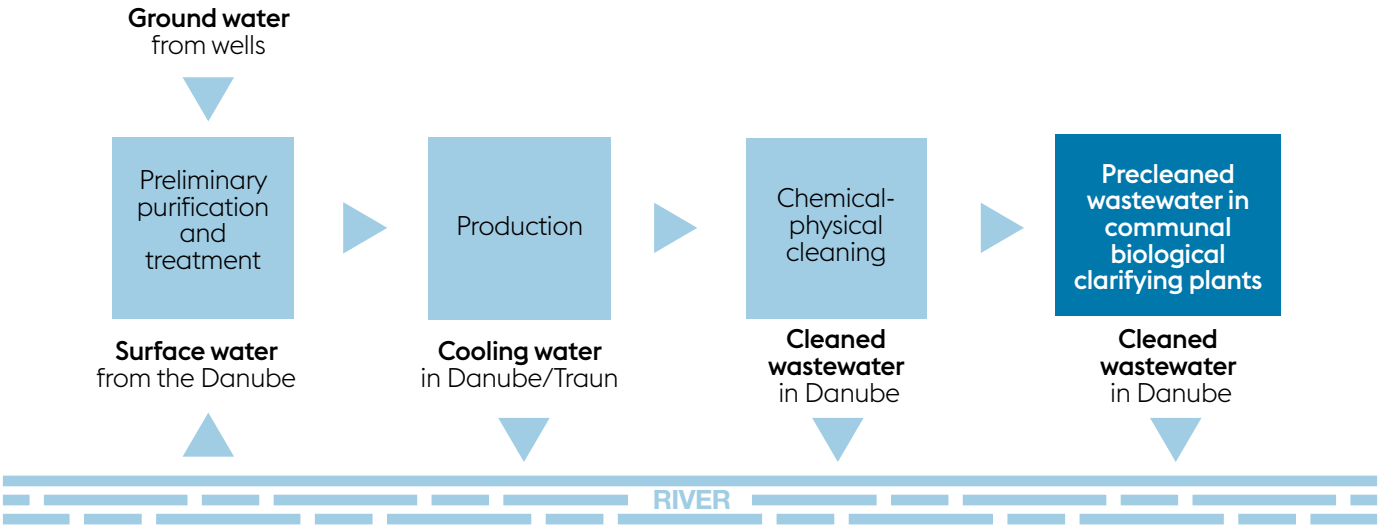
Functional water circulation is the foundation for an operational system. This is why voestalpine Giesserei Traisen strives to achieve sustainable resource management by linking water management with energy and environmental services under the premise of preserving flora and fauna.

The direct net fresh water consumption of voestalpine at the Linz site in the 2018 calendar year amounted to 6.8 million $m^3$ or 1.46 $m^3$/ton of crude steel.

Relining and refurbishment of the largest production unit at the Linz site, Blast Furnace A, and associated interruption of operations for an extended period of time led to lower water utilization as compared to 2017.

The impact of production systems at the Linz site on local water systems is relatively small and does not lead to an increase in water scarcity in the region. This conclusion was reached during a Water Scarcity Footprint study conducted in 2018, which, in addition to the Linz site, also included an analysis of all operations and the Group's entire value chain (cradle to gate).

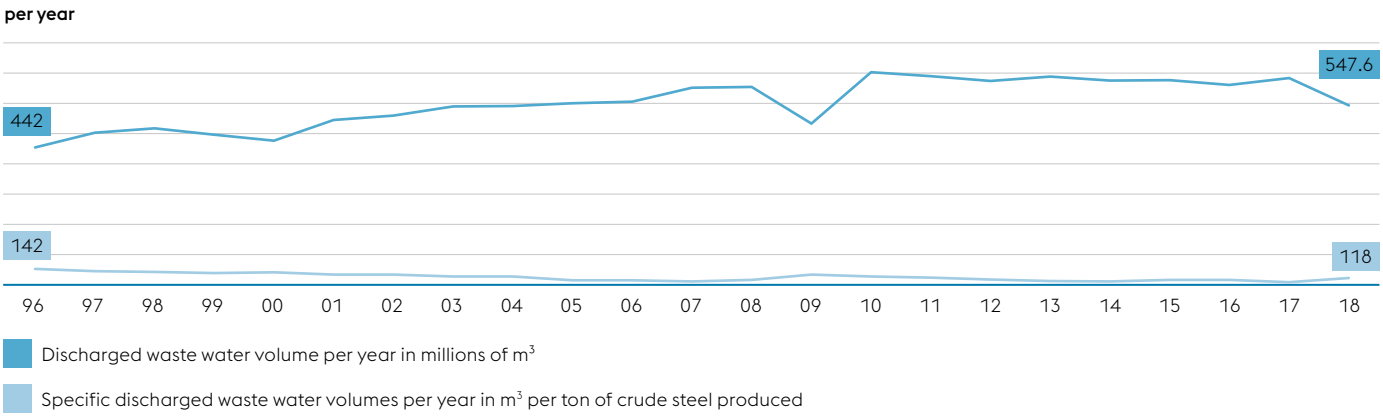
CAREFUL TREATMENT OF WATER AS A NATURAL RESOURCE IS REGARDED AS A FUNDAMENTAL PRIORITY AT voestalpine.



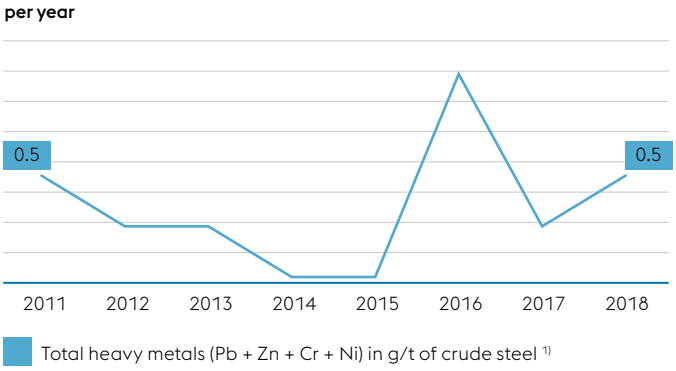
## Trends in discharged waste water volumes

In the 2018 calendar year, the amount of discharged water amounted to 118 $m^3$ per ton of crude steel.

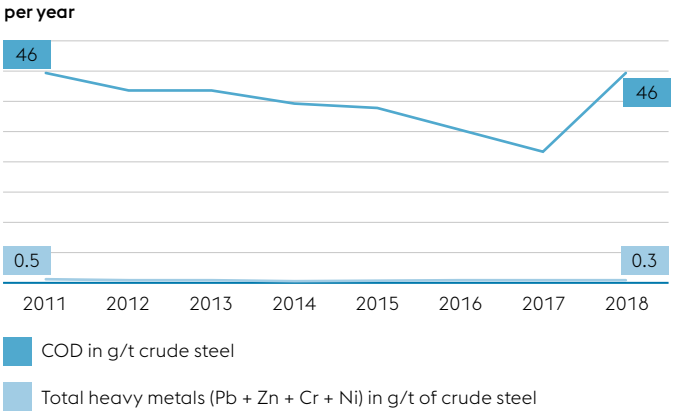
### WATER DISCHARGE VOLUMES




### SPECIFIC DISCHARGE INTO DANUBE




### DISCHARGE INTO MUNICIPAL WASTEWATER TREATMENT PLANT

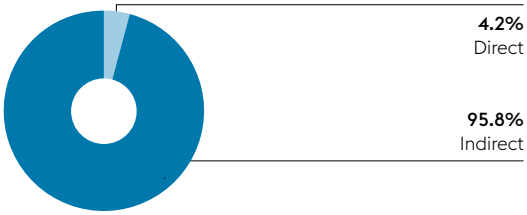



## Water footprint at the Linz site, LCA

Pursuant to ISO 14046, voestalpine takes a holistic view of the water systems across all production sites and implements the lifecycle assessment.

Calculation of the Water Scarcity Footprint is carried out to assess the detailed contribution to water scarcity in the region. The assessment takes into account the hydro-geological properties at the production site. This lifecycle analysis showed that only roughly 4% of the water scarcity indicator surveyed was within the sphere of influence of the Linz site. Almost 96% is determined by upstream processes (mainly raw material supply).

### WATER-SCARCITY-FOOTPRINT




1) minus initial load from Danube

# ENVIRONMENTAL FOCUS ON WASTE

**The objective is to reduce and reuse waste.**


91%

Material recycling and the portion of re-used waste materials in total amount to a resource reutilization of 91% with respect to all waste processed off site and on site.

**Reduce.** Reduced external disposal of sludge from water treatment systems based on recovery of iron-rich fraction by flotation

**Reuse.** n. a.

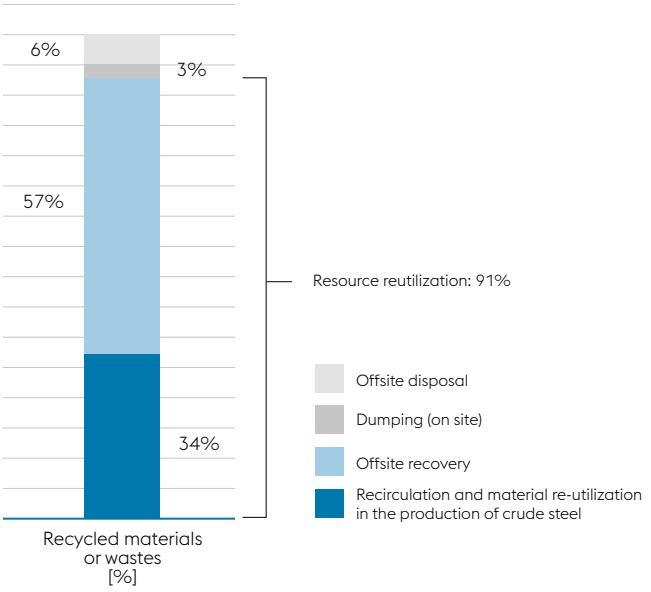
**Repair.** Use of waste oils as a substitute reducing agent

**Recycle.** Zinc recycling from steel mill dusts

Numerous waste and circulating materials are incurred during steelmaking and are returned to the production processes. This conserves natural raw materials. Waste and secondary raw materials are utilized in both in-house and external production process. Examples of this are scrap, end-of-life oils and waste greases. The following graphic provides an overview of utilized resources in the form of waste and recycled materials at the Linz site (not including scrap).

## RESSOURCE EFFICIENCY

**Recyclable and waste materials incurred at the Linz site**



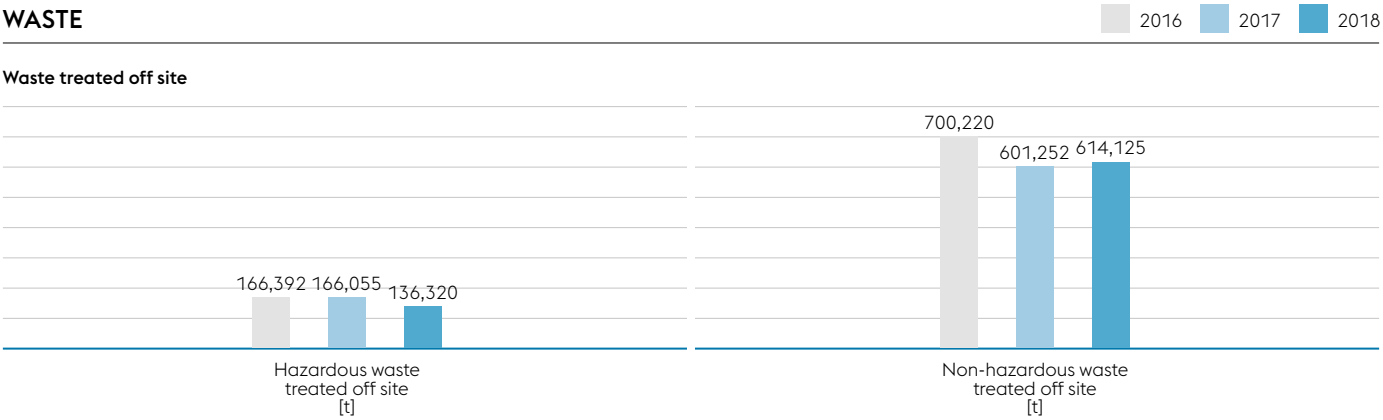

In the 2018 calendar year, roughly 34% of the recycled materials and waste incurred at the Linz location were re-utilized, thus increasing resource efficiency in production processes. (This value is increased to 56% when in-house scrap recycling is taken into account.)

Material recycling and the portion of re-used waste materials in total amount to a resource reutilization of 91% with respect to all waste processed off site and on site.

Sustainable policies to conserve natural resources play a major role at the Traisen site. The aim of material management is to use the materials taken from nature as intensively as possible and to return them to production cycles.

## WASTE

**Waste treated off site**



# ENVIRONMENTAL FOCUS ON TRANSPORTS

**More rail, less road.**


# 60%

59.9% of the products are delivered by rail. In the case of raw materials, the figure is as high as 69% by rail, 31% by ship and less than 0.1% by truck (Linz site, 2018).

**Reduce.** Reduction of emissions through the use of sustainable and climate-friendly means of transport

**Reuse.** Closed-loop product, production scrap in the automotive industry: Use of free railway car capacities

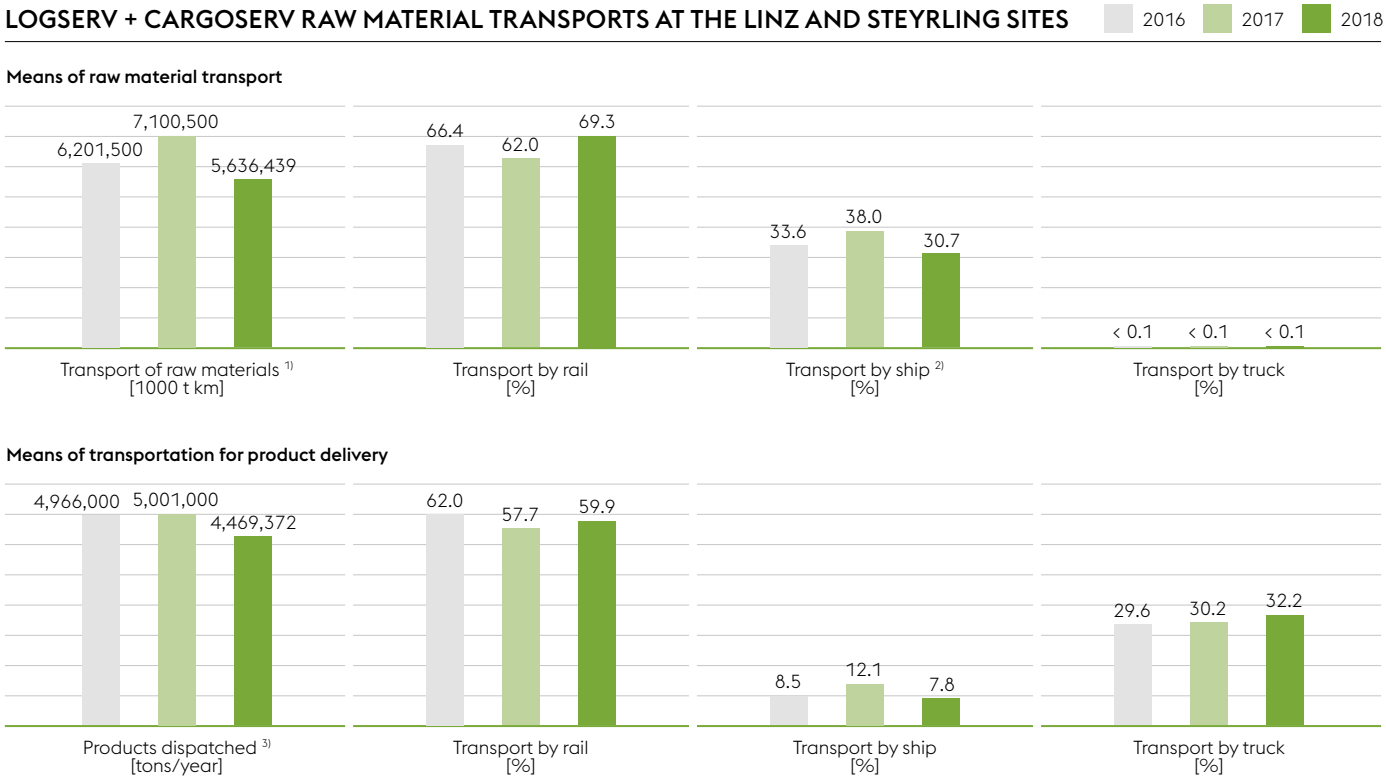
**Repair.** Shifting of transports from road to rail or ship

**Recycle.** n. a.

Material supply and product delivery are by railway, waterway or truck. It is important to us that our transports are as ecological as possible. Logistik Service GmbH and Cargo Service GmbH combine their transport possibilities, e.g. mobile systems, in order to avoid empty hauls and rely heavily on continual improvements in logistics systems, in technologies, implementation, methods, environmentally compatible driving techniques. Where possible, as many transports as possible are transferred from the roadway to the more environmentally compatible railway.

The figures for distribution of raw materials transported within Europe and distribution of product deliveries to the individual means of transport are as follows in the 2018 calendar year:

**LOGSERV + CARGOSERV RAW MATERIAL TRANSPORTS AT THE LINZ AND STEYRLING SITES**




The definition of emissions is difficult to impossible because of the large number of transport routes in use by the various means of transport (railway, ship, truck) with a wide variety of engine and vehicle technologies.

For this reason, no direct emission assessment is made for the transport of raw materials and for the delivery of products to voestalpine at the Linz location. Only the modal split is used as evaluation criteria for the assessment according to the respective transport routes.

Customers throughout the world are supplied by voestalpine Giesserei Traisen GmbH. In collaboration with a dynamic network of suppliers and customers, the challenge is to achieve sustainable development in each process stage of the supply chain. The geographical location and the infrastructure of the Traisen site provide only few possibilities for loading and unloading. Strategic decisions must yet be made with respect to the selection of suppliers, delivery windows and the efficient use of transport vehicles based on product and market requirements.

[1] Raw material deliveries in ton kilometers of ore, coal, scrap, lime, coke and coke breeze
[2] Raw material transport by inland waterway
[3] Products supplied from the Linz site by Logistik Service GmbH and Cargo Service GmbH

# SAFETY TAKES HIGHEST PRIORITY
# SEVESO PRODUCTION SYSTEMS

## External emergency plan

Detailed information on the alarms and measures outside the works premises can be found in the external emergency plan issued by the fire department of the city of Linz. Required measures in the event of Danger Level III are contained in the internal emergency plan. The safety report complies with Section 84f of the Trade and Industrial Code dated 1994 and is available for review in the Environment Department of voestalpine Stahl GmbH.

**Information to the public on safety measures and correct behavior in the event of industrial accidents pursuant to Section 14 of the Industrial Accident Act.**

At the Linz production site, voestalpine Stahl GmbH operates plant systems that are subject to Section 8a of the Trade and Industrial Code of 1994 and the Industrial Accident Act and provides the following information on safety measures and proper behavior in the event of industrial accidents. Not every plant system failure is an industrial accident, which is defined as an event in which certain hazardous substances are released that pose a danger to humans or to the environment.

The precautions to be taken to prevent and limit industrial accidents are set forth in the Industrial Accident Act. Because of the comprehensive safety measures that have been taken for many years in production, the probability of you as a neighbor being affected by an industrial accident is very low. An industrial accident can only occur in the event that all the precautionary technical and organizational measures simultaneously fail. In the unlikely event that an industrial accident occurs in spite of all the safety measures that have been implemented, the following information advises you of steps to take.

There are six relevant plant areas in the integrated metallurgical facility that could have an effect beyond the works premises in unlikely event of an industrial accident:

- Coke oven batteries, including coking gas recovery, conveyor system and gasometer.
- Tar extraction and crude benzene plant, including storage tank
- Blast furnaces, including gas cleaning, conveyor system and gasometer
- Converter operations, including converter gas cleaning, conveyor system and gasometer
- Unloading of fuel oil and distribution into piping and storage tanks
- Storage and distribution lines for calcium carbide in the steelmaking plant

Steam reformers A and B and air disintegration units 8 through 10 are operated by Linde Gas GmbH according to the Linde low-pressure technology and are safety-relevant systems installed on the works premises in Linz.

The substances contained in the systems of voestalpine Stahl GmbH and Linde Gas GmbH are subject to the provisions set forth in Section 8a of the Trade and Industrial Code dated 1994.

COMPREHENSIVE SAFETY MEASURES ARE IN PLACE TO ENSURE THAT THE RISK OF AN INDUSTRIAL ACCIDENT IS EXTREMELY LOW.

The authorities have been notified pursuant to Section 84d, of the Trade and Industrial Code. Corresponding safety and security reports were submitted to the authority (Magistrate of the Provincial Capital of Linz, Office of the Provincial Government). The information is submitted to or updated at regular intervals and can be consulted there. This environmental report is also available at Central Works Security Post A.

The following safety aspects are taken into account in the safety report submitted:

- Processes and reactions occur in closed systems.
- Hazardous substances are replaced where possible and remaining amounts are reduced to the specifically required volumes.
- The avoidance of waste takes a high priority in the planning and operation of plants.
- Safety systems generally consist of multiple stages.
- The plants are operated, maintained and tested by qualified and regularly re-trained personnel.

The plants are regularly tested in accordance with legal regulations by in-house and external experts, e.g. TÜV. Stringent safety regulations are assessed by the authorities for all designated plant systems. As a result of these regulations and precautions taken by the operators, there has never been an accident at the works since it has existed that would have posed any hazard to the population. In spite of the high safety standards, then risk of accidents can never be completely eliminated. Even though the probability of an accident with effects beyond the works premises is very low, voestalpine Stahl GmbH nevertheless takes this opportunity to inform the public in a precautionary manner of possible effects and measures to take in the event of an accident.

## Information on possibly hazardous plant systems and production activities

### COKE OVEN BATTERIES, INCLUDING COKING GAS RECOVERY, CONVEYOR SYSTEM AND GASOMETER

The coke required in the blast furnace is produced in the coking plant. For this purpose, finely ground coal is heated in coking ovens that are arranged in batteries each containing a total of 40 ovens. The coal is heated for approximately 18 hours to a temperature of roughly 1,250 °C. The coal is converted into coke, which means that it is baked until it has released all its gaseous constituents. These gaseous constituents make up the coke gas that is cleaned to a high degree in the coking plant and is then used as a fuel gas in the power plant and other furnace systems throughout the steel works. A gasometer and a network of gas lines store the gas until it is used. The system of course is closed. Coke gas contains approximately 7% carbon monoxide and is, as are all flammable gases, combustible with certain amounts of air.

### TAR EXTRACTION AND CRUDE BENZENE PLANT, INCLUDING STORAGE TANK

Crude tar and crude benzene occur as co-products during the high-grade cleaning of the coke gas. Crude benzene is cleaned out of the coke gas by means of wash oil in two scrubbers. It is then removed by means of distillation from the circulating wash oil and stored intermediately in a 2,000 $m^3$ tank before it is delivered to purchasers. The crude benzene storage tank is suctioned out. The filling process is by means of a gas displacement device to ensure that no emissions can be released. Crude benzene contains up to 85% benzene. The fumes are, as with all other flammable liquids, combustible when mixed with certain amount of air. The crude tar condenses with condensation from the crude coke gas and is separated in tar separators from the condensate. Crude tar is pumped through the intermediate tar containers into the crude tar tanks. The individual parts of the tar separator units are equipped with a liquid-tight bucket system to prevent any emission to the environment. The crude tar and crude benzene are contained in tank railcars until they are used in the closed systems of production lines.

### BLAST FURNACES, INCLUDING GAS CLEANING, CONVEYOR SYSTEM AND GASOMETER

Blast furnace gas is a by-product and co-product that occurs during the production of hot metal in the blast furnace. This blast furnace gas is cleaned to a high degree, removing all the dusts, and is used as a fuel gas in the blast furnace itself, the power plant, in the coking plant and other furnace systems throughout the steel works. A gasometer and a network of gas lines store the gas until it is used. The entire network is a closed system. Blast furnace gas contains approximately 25% carbon monoxide and is, as are all flammable gases, combustible with certain amounts of air.

### CONVERTER OPERATIONS, INCLUDING CONVERTER GAS CLEANING, CONVEYOR SYSTEM AND GASOMETER

Steel chemically differs from iron primarily in its lower carbon content. The carbon contained in the crude iron produced in the blast furnace is removed from the steel melt by means of the oxygen top-blowing process during steelmaking in the LD steel plant. This process yields the so-called converter gas that is subjected to a high-grade cleaning process in electric filters and then added in a controlled manner to the top gas in order to increase its calorific value. A gasometer and a network of gas lines store the gas until it is used. The system of course is closed. Converter gas contains approximately 60% carbon monoxide and is, as are all flammable gases, combustible with certain amounts of air.

## AIR DISINTEGRATION PLANT

Air is divided in air separation units (8 through 10) belonging to Linde Gas GmbH by means of rectification into nitrogen, oxygen and argon constituents. The generated gases are either piped in gaseous form to consumers in the works of voestalpine Stahl GmbH or to the Chemiepark or they are liquefied, stored at super-cooled temperatures and filled into tank cars. In addition to the air as a raw material and different energies, hydrogen is also required in argon fine cleaning system (8) of the air separation unit. This hydrogen is supplied by the hydrogen production facility at voestalpine.

## HYDROGEN GENERATION SYSTEM COMPLEX

Natural gas is converted through chemical reactions into hydrogen in the steam reformers (STR A and B) of Linde Gas GmbH. The gaseous hydrogen is used in-house and is supplied to voestalpine Stahl GmbH and Chemiepark in Linz. External customer supply is provided on trailer units.

## UNLOADING OF FUEL OIL AND DISTRIBUTION INTO PIPING AND STORAGE TANKS

Light fuel oil is delivered in tank trucks and pumped into the storage tanks at the power station of voestalpine Stahl GmbH. The light fuel oil is pumped through piping from the storage tank to block 7 of the power plant of voestalpine Stahl GmbH. The light fuel oil is used in the event that other fuels, such as the usually used metallurgical gases and natural gas, are temporarily not available. In order to ensure that the light fuel oil is ready for use, it is continuously circulated in piping between the storage tank and the power station in order to maintain the required temperature and pressure.

## STORAGE AND DISTRIBUTION LINES FOR CALCIUM CARBIDE IN THE STEELMAKING PLANT

The hot metal is combined with scrap and additives in three converters in the LD steelmaking plant. The mixture is converted in an oxygen blowing process at approximately 1,650 °C to crude steel. Further treatment takes place in the ladle furnace and in the vacuum degassing unit. The molten steel is cast in the continuous caster into slabs.

Calcium carbide is used in the steelmaking plant to remove sulfur (desulfurization) and oxygen (deoxidation) from the hot metal.

A high standard of safety is guaranteed by continuous monitoring by plant personnel, regular tests and the safety precautions described above. Should an industrial accident occur, however, in spite of all the technical and organizational preparation made to prevent such an incident, the emission of poisonous substances still poses a possible danger in addition to explosion and fire. In such an instance, affects to human health and the natural environment outside the works premises, especially caused by gas or fumes that may be carried over distances, cannot be excluded.

## Information on the types of dangers and their possible consequences

The following substances when emitted into the atmosphere pose a potential danger beyond the premises of the steel works.

### CARBON MONOXIDE

Carbon monoxide is contained in

- Coking plant gas (approx. 7 volume percent CO)
- Blast furnace gas (approx. 25 volume percent CO)
- Converter gas (approx. 60 volume percent CO)

The listed process gases are easily combustible and are poisonous because of their CO content. When emitted to the atmosphere, these gases are diluted with atmospheric air to differing degrees that lead to various symptoms depending on the respective concentrations. These symptoms may include headache, dizziness, sickness, sleepiness, asphyxiation, unconsciousness and respiratory paralysis. Patients must be exposed to fresh air, must rest comfortably and tight clothing must be loosened. In the event of apnea, resuscitation is required to introduce oxygen to the brain. Call a doctor. Keep patients warm. In the event of threatening unconsciousness, place the patient on his or her side and transport in stable position.

### BENZENE

Patients must be exposed to fresh air, must rest comfortably and tight clothing must be loosened. Resuscitate immediately in the event of apnea. Remove contaminated clothing immediately. Rinse contaminated skin sufficiently with water. Rinse contaminated eyes adequately with water for ten to fifteen minutes. Call a doctor. Keep patients warm. In the event of threatening unconsciousness, place the patient on his or her side and transport in stable position.

### ATMOSPHERIC GASES AND HYDROGEN

Because of their volumes and properties (both not poisonous) and distances to other substances, the hazardous substances (oxygen, nitrogen, argon and hydrogen) contained in the air separation and hydrogen production units are not potentially hazardous outside the premises of voestalpine Stahl GmbH.

### CALCIUM CARBIDE

The carbide mixture in the hopper contains essential constituents as follows:

| | |
|---|---|
| Calcium carbide ($CaC_2$): | 63.1%–72.3% |
| Coal, including volatile constituents: | 5.5% |
| Carbon content: | 32.59%–19.14% |
| Additional fluxes: | 3.0% |

Calcium carbide is not a flammable substance. Ethyne develops in the presence of moisture and mixes with air to form an explosive gas atmosphere and calcium hydroxide. The humidity from the air is enough to begin the reaction. Under atmospheric conditions, one ton of calcium carbide of technical quality (roughly 68% $CaC_2$) in reaction with water yields roughly 258 $Nm^3$ ethyne (= acetylene gas).

## MEASURES

The measures taken to eliminate accidents and limit the consequences of an accident are regulated in the emergency plan of voestalpine Stahl GmbH. This plan is regularly updated in collaboration with the Municipal Offices of the Provincial Capital City of Linz and the fire department of Linz pursuant to the pertinent official regulations of the provincial capital of Linz.

The measures to be taken in the event of an incident are obligatory. The safety report of voestalpine Stahl GmbH is submitted on a regular basis to the authorities. The report is an integral part of the tests carried out by the responsible authorities that also serve to meet requirements and adaptations pursuant to Section 8a of the Trade and Industrial Code dated 1994.

With respect to the air separation unit, a safety report has also been submitted by Linde Gas GmbH.

## EXTERNAL EMERGENCY PLAN

Detailed information on the alarms and measures outside the works premises can be found in the external emergency plan issued by the fire department of the city of Linz. Required measures in the event of Danger Level III are contained in the internal emergency plan. Notification procedures (excerpt from the emergency plan of voestalpine Stahl GmbH). The following measures have been determined in accordance with the emergency plan of voestalpine Stahl GmbH:

- Works fire department responds to the scene with all fire trucks and breathing apparatus vehicle
- Fire department of the City of Linz responds to the scene
- Establishment of a command center on site managed by City of Linz fire department
- Measurements taken to eliminate dangers such as cordoning off area by gas search troop, evacuation of the cordoned off area, radio announcements

**Warning**

The public is warned by means of sirens in the event of an extraordinary incident. Industrial accidents on the premises of voestalpine Stahl GmbH and steps to be taken by the public are announced on public radio and television stations. This procedure and the type of reports required by the authorities are defined in the in-house emergency plan submitted to the authorities.

**Note**

Please do not call emergency telephone numbers without any important reason. This will ensure that the lines remain open for actual emergencies.

**Contact numbers for inquiries and further information**

Central office: T. +43/50304/15-5077 or +43/50304/15-2629
Environmental Department: T. +43/50304/15-5783
Occupational Safety Department: T. +43/50304/15-9806
Linde Gas GmbH: T. +43/50/4273-1616

**Link to Environmental Report on the Internet:**

www.voestalpine.com/group/en/group/environment/environmental-management

OVERVIEW OF POTENTIAL HAZARDS AND COMPREHENSIVE EMERGENCY PLANS FOR THE FACTORY PREMISES

# ADDITIONAL ENVIRONMENTAL IMPACT

PROTECTING OUR NEIGHBORS FROM NOISE AND OBNOXIOUS ODORS IS AN IMPORTANT PRIORITY FOR US.

## RADIATION

All raw materials at the Linz and Traisen sites are inspected thoroughly for radiation by highly sensitive devices before they are delivered to production facilities. Radioactive tests are conducted on all heats of the intermediate hot-metal product to exclude any risk.

## NOISE

The works premises in Linz has been divided into 16 contingency sections according to the environmental impact assessment (L6). Higher noise loads of individual surface areas can be balanced by surface areas that do not reach permissible noise levels. From the perspective of neighborhood protection, limitation of noise emissions is important with respect to on-site expansion. In the event any complaints from residents surrounding the Linz, Steyrling and Traisen sites, a root cause analysis is carried out and, if necessary, appropriate measures are initiated and implemented.

## ODOR

Based on measures taken in the past to prevent and minimize emissions at the Linz location, a favorable level has now been achieved to the effect that no adverse odors are produced.

## VIBRATIONS

Lime-containing rock at the Steyrling site is mined from the walls of an open pit by means of conventional blasting. This can cause ground vibration. Blasting activities are announced to neighboring parties ahead of time.

Production and transport-related vibrations at the Traisen site are transmitted through the soil as a result of the geological and geographical conditions. Technological and organizational measures are implemented in order to avoid vibrations during operation of various production systems and processing.

At every production site, voestalpine treats local ecosystems responsibly and actively contributes to the promotion of biodiversity.

## BIODIVERSITY

At the Linz site, for example, flowering areas have been created on a surface area of roughly 20,000 square meters. The wildflower meadow provides many insect species, especially bees, with an additional food source. Insect hotels also offer a breeding location for rare species. A project aimed at managing several bee colonies at the site has been implemented. Several voestalpine employees with many years of beekeeping experience provide major support for this project.

# INFORMATION, CONTACT PARTNERS AND ABOUT US

## Environmental report

**The next consolidated Environmental Report will be submitted for review in October 2022 and published thereafter. In addition, an updated version is created, externally reviewed and published on an annual basis.**

## Certified environmental experts

Harald Ketzer
Florian Mitterauer
Lloyd's Register EMEA/Vienna branch
Opernring 1/E/620, 1010 Wien, Austria

Lloyd's Register

**ENVIRONMENTAL VERIFIER'S DECLARATION ON VERIFICATION AND VALIDATION ACTIVITIES**

Lloyd's Register Quality Assurance Ltd., with EMAS environmental verifier registration number AT-V-0022 and accredited for the scope:

**Integrated mill of voestalpine Stahl GmbH and their subsidiaries at site Linz as well as extraction and production of lime at site Steyrling and production of steel castings at site Traisen.**
**(separate scopes see appendix)**
NACE Code: see appendix

declares to have verified:

**voestalpine Stahl GmbH, voestalpine Giesserei Linz GmbH, voestalpine Camtec GmbH, Cargo Service GmbH, Logistik Service GmbH, voestalpine Grobblech GmbH, voestalpine Automotive Components Linz GmbH, voestalpine Standortservice GmbH, voestalpine Steel & Service Center GmbH, voestalpine Giesserei Traisen GmbH**
**Linz, Steyrling, Traisen**
**Austria**

registration number AT-000216
meets all requirements of Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a Community Eco-Management and Audit Scheme (EMAS) amended by commission regulation (EU) 2017/1505 and 2018/2026.

By signing this declaration, LRQA declares that:

- the verification and validation has been carried out in full compliance with the requirements of Regulation (EC) No 1221/2009,
- the outcome of the verification and validation confirms that there is no evidence of non-compliance with applicable legal requirements relating to the environment,
- the data and information presented in the Environmental Statement of the organisation reflect a reliable, credible and correct image of all the organisation's activities within the scope mentioned in the environmental statement

This document is not equivalent to EMAS registration. EMAS registration can only be granted by a Competent Body under Regulation (EC) No 1221/2009. This document shall not be used as a stand-alone piece of public communication.

LRQA Ref No: VNA0005063-04

| | |
|---|---|
| Date of verification: | 20 October 2014 |
| Verification Expiry: | 19 October 2020 |
| Date of validation: | 22 October 2019 |
| Validation Expiry: | 19 October 2020 |

DI Harald Ketzer, Lead Verifier
Lloyd's Register EMEA, Niederlassung Wien
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on behalf of Lloyd's Register Quality Assurance Limited
Akkreditierungsnummer: AT-V-0022

Lloyd's Register EMEA Niederlassung Wien, Opernring 1/R/741-744, 1010 Wien, Österreich, FN 239257 z
Die Gültigkeitserklärung gilt zusammen mit der Validierung als Nachweis über die Verifizierung und Validierung. Sie werden bei der Beantragung auf Eintrag bei der zuständigen Stelle nach Artikel 3 der Verordnung benötigt. Der Text dieser Erklärung muss vollständig in der Umwelterklärung der Firma abgedruckt werden.

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EMAS
Geprüftes Umweltmanagement
REG.NO. AT- 000216

The Linz, Steyrling and Traisen locations have established independent environmental management systems. The public is informed of the environmental measures taken at these locations in compliance with the community systems for environmental management and environmental impact assessment.

**REGISTRY NUMBER: AT-000216**

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voestalpine
ONE STEP AHEAD.