ANDRITZ

ENGINEERED SUCCESS

Sustainable solutions for decarbonization

ANNUAL REPORT 2022

THE ANDRITZ GROUP

	Unit	2022	2021	2020	2019	2018
Order intake	MEUR	**9,263.4**	7,879.7	6,108.0	7,282.0	6,646.2
Order backlog (as of end of period)	MEUR	**9,976.5**	8,165.8	6,774.0	7,777.6	7,084.3
Revenue	MEUR	**7,542.9**	6,463.0	6,699.6	6,673.9	6,031.5
EBITDA[1]	MEUR	**825.5**	718.3	571.1	537.6	498.0
EBITDA margin	%	**10.9**	11.1	8.5	8.1	8.3
EBITA[2]	MEUR	**648.5**	546.5	391.7	343.2	394.3
EBITA margin	%	**8.6**	8.5	5.8	5.1	6.5
Earnings Before Interest and Taxes (EBIT)	MEUR	**572.7**	479.6	315.0	237.9	321.6
EBIT margin	%	**7.6**	7.4	4.7	3.6	5.3
Earnings Before Taxes (EBT)	MEUR	**540.9**	439.6	280.9	180.9	304.2
Net income (including non-controlling interests)	MEUR	**402.6**	321.7	203.7	122.8	219.7
Non-current assets	MEUR	**2,571.2**	2,585.2	2,497.5	2,705.5	2,629.5
Current assets	MEUR	**5,920.6**	5,087.6	4,559.2	4,528.6	4,289.1
Total shareholders' equity[3]	MEUR	**1,834.7**	1,567.3	1,255.7	1,219.6	1,330.8
Provisions	MEUR	**958.3**	1,078.0	1,144.9	1,083.1	1,017.7
Liabilities	MEUR	**5,698.8**	5,027.5	4,656.1	4,931.4	4,570.1
Total assets	MEUR	**8,491.8**	7,672.8	7,056.7	7,234.1	6,918.6
Equity ratio[4]	%	**21.6**	20.4	17.8	16.9	19.2
Liquid funds[5]	MEUR	**2,051.1**	1,837.9	1,719.3	1,609.8	1,279.7
Net liquidity[6]	MEUR	**983.0**	703.3	420.9	244.9	-99.6
Cash flow from operating activities	MEUR	**710.8**	529.6	461.5	821.6	7.8
Capital expenditure[7]	MEUR	**184.4**	160.1	131.8	157.1	137.0
Employees (as of end of period; without apprentices)	–	**29,094**	26,804	27,232	29,513	29,096

1 Earnings Before Interest, Taxes, Depreciation, and Amortization
2 Earnings Before Interest, Taxes, Amortization and impairment of identifiable assets acquired in a business combination and recognized separately from goodwill amounting to 65.6 MEUR (2021: 62.1 MEUR), and impairment of goodwill in the amount of 10.2 MEUR (2021: 4.8 MEUR)
3 Total shareholders' equity including non-controlling interests
4 Total shareholders' equity/total assets
5 Cash and cash equivalents plus investments
6 Liquid funds minus financial liabilities
7 Additions to intangible assets and property, plant, and equipment

ANDRITZ GROUP

International technology group ANDRITZ offers a broad portfolio of innovative plants, equipment, systems, services and digital solutions for a wide range of industries and end markets. Sustainability is an integral part of the company's business strategy and corporate culture. With its extensive portfolio of sustainable products and solutions, ANDRITZ aims to make the greatest possible contribution to a sustainable future and help its customers achieve their sustainability goals. ANDRITZ is a global market leader in all four of its business areas – Pulp & Paper, Metals, Hydro and Separation. Technological leadership and global presence are cornerstones of the group's strategy, which is focused on long-term profitable growth. The publicly listed group has around 29,100 employees and over 280 locations in more than 40 countries.

PULP & PAPER

	Unit	2022	2021	2020	2019	2018
Order intake	MEUR	**4,378.7**	3,774.7	2,961.1	3,632.5	2,571.9
Order backlog (as of end of period)	MEUR	**4,248.4**	3,377.2	2,591.0	3,164.3	2,421.1
Revenue	MEUR	**3,591.1**	3,070.6	3,339.0	2,869.5	2,233.2
EBITDA	MEUR	**471.0**	423.4	399.6	351.4	258.4
EBITDA margin	%	**13.1**	13.8	12.0	12.2	11.6
EBITA	MEUR	**387.8**	346.0	322.7	271.0	222.1
EBITA margin	%	**10.8**	11.3	9.7	9.4	9.9
Capital expenditure	MEUR	**105.5**	90.6	64.1	63.3	33.8
Employees (as of end of period; without apprentices)	–	**13,525**	11,668	11,127	11,984	11,435

ANDRITZ Pulp & Paper provides sustainable technology, automation, and service solutions for the production of all types of pulp, paper, board and tissue. The technologies and services focus on increased production efficiency, lower overall operating costs as well as innovative decarbonization strategies and autonomous plant operation.

The product portfolio also includes boilers for power generation, flue gas cleaning systems, various nonwoven technologies, and panelboard (MDF) production systems. With waste-to-value recycling, shredding and energy solutions, waste and by-product streams from production are converted into valuable secondary raw materials as well as into sustainable resources for energy generation. State-of-the-art IIoT technologies as part of Metris digitalization solutions complete the comprehensive product offering.

METALS

	Unit	2022	2021	2020	2019	2018
Order intake	MEUR	**2,008.6**	1,778.8	1,143.6	1,582.2	1,931.8
Order backlog (as of end of period)	MEUR	**1,938.1**	1,541.7	1,181.6	1,532.7	1,591.6
Revenue	MEUR	**1,621.2**	1,366.1	1,420.5	1,636.9	1,635.1
EBITDA	MEUR	**100.9**	81.7	5.5	-1.5	57.8
EBITDA margin	%	**6.2**	6.0	0.4	-0.1	3.5
EBITA	MEUR	**62.3**	38.4	-46.7	-73.8	27.3
EBITA margin	%	**3.8**	2.8	-3.3	-4.5	1.7
Capital expenditure	MEUR	**31.8**	25.5	26.5	30.8	36.1
Employees (as of end of period; without apprentices)	–	**6,085**	5,930	6,513	7,485	7,818

ANDRITZ Metals is – via the Schuler Group – one of the world's leading suppliers of technologies, plants and digital solutions in metal forming. The product portfolio also includes automation and software solutions, process know-how and service. In the metals processing segment, the business area offers innovative, sustainable and market-leading solutions for the production and processing of flat products, for welding systems and furnaces with its own burner solutions, as well as services for the metals processing industry.

HYDRO

	Unit	2022	2021	2020	2019	2018
Order intake	MEUR	**1,956.6**	1,565.2	1,335.4	1,350.2	1,445.8
Order backlog (as of end of period)	MEUR	**3,165.5**	2,747.8	2,587.9	2,661.0	2,667.9
Revenue	MEUR	**1,539.0**	1,345.1	1,296.0	1,470.7	1,517.5
EBITDA	MEUR	**156.0**	133.0	98.5	134.1	142.4
EBITDA margin	%	**10.1**	9.9	7.6	9.1	9.4
EBITA	MEUR	**114.7**	95.4	62.0	105.9	113.8
EBITA margin	%	**7.5**	7.1	4.8	7.2	7.5
Capital expenditure	MEUR	**29.7**	28.7	29.7	51.8	57.9
Employees (as of end of period; without apprentices)	–	**6,751**	6,628	6,941	7,202	7,002

ANDRITZ Hydro is one of the globally leading suppliers of electromechanical equipment and services for hydropower plants in the dynamically growing, global market for renewable energy. With over 180 years of experience and an installed capacity of more than 470 GW output worldwide, the business area provides complete solutions for new and existing hydropower plants of all sizes. The services offered range from plant diagnosis, rehabilitation, modernization, and upgrade to operation and maintenance of entire hydropower plants. Pumps for irrigation, water supply and flood control as well as turbo generators complete the business area's portfolio.

SEPARATION

	Unit	2022	2021	2020	2019	2018
Order intake	MEUR	**919.5**	761.0	667.9	717.1	696.7
Order backlog (as of end of period)	MEUR	**624.5**	499.1	413.5	419.6	403.7
Revenue	MEUR	**791.6**	681.2	644.1	696.8	645.7
EBITDA	MEUR	**97.6**	80.2	67.5	53.6	39.4
EBITDA margin	%	**12.3**	11.8	10.5	7.7	6.1
EBITA	MEUR	**83.7**	66.7	53.7	40.1	31.1
EBITA margin	%	**10.6**	9.8	8.3	5.8	4.8
Capital expenditure	MEUR	**17.4**	15.3	11.5	11.2	9.2
Employees (as of end of period; without apprentices)	–	**2,733**	2,578	2,651	2,842	2,841

ANDRITZ Separation provides mechanical and thermal technologies as well as services and the related automation solutions for solid/liquid separation, serving the chemical, environmental, food, and the mining and minerals industries. The customized, innovative solutions focus on minimizing the use of resources and achieving highest process efficiency, thus making a substantial contribution towards sustainable environmental protection. In addition, the business area offers technologies and services for the production of animal feed and biomass pellets.

TABLE OF CONTENTS

PULP & PAPER

9

INNOVATIVE TOGETHER

ANDRITZ has delivered the first CO_2 capture plant for the German cement industry to Rohrdorfer Zement. The ANDRITZ technology substantially supports Rohrdorfer on the way to carbon-free cement production.

PULP & PAPER

17

PERFECT CYCLE

With support from ANDRITZ, the Brazilian pulp and paper producer Klabin produces sulfuric acid from gases that form in the mill itself – and thus is also reducing green-house gas emissions.

METALS

24

GREEN STEEL

The European steel industry intends to produce CO_2-neutral steel by 2050. At voestalpine Wire Rod, ANDRITZ is already contributing towards saving energy and avoiding emissions with a new furnace design.

HYDRO

30

BENEFICIAL HYDROPOWER

CO_2 emissions can be reduced effectively with the aid of hydro-power. Two ANDRITZ projects demonstrate this in an impressive manner.

SEPARATION

38

VALUABLE WASTE

In Fort Worth, Texas, ANDRITZ technology is efficiently used to convert biosolids into fertilizer while at the same time reducing carbon emissions from biosolids treatment.

EDITORIAL

Global warming presents a huge challenge in all areas of our lives and economic activities.

ANDRITZ is aware of this and acting accordingly. With our custom-tailored products and solutions for renewable energy sources, decarbonization, electromobility, the circular economy and alternative proteins, we help our customers all over the world to achieve their sustainability goals.

ANDRITZ is also working very hard on reducing the company's own CO_2 footprint and becoming climate-neutral in the long term. As part of our sustainability program "We Care", we have defined ambitious goals in terms of reducing direct and indirect CO_2 emissions, water consumption and waste volumes.

MORE know-how, innovative technologies and greater efficiency result in LESS CO_2 emissions. We see this in our customer projects and also when we implement internal sustainability measures. In the following pages, we report on how ANDRITZ is pushing decarbonization forward with its products in close partnership with its customers.

LETTER FROM THE EXECUTIVE BOARD

Joachim Schönbeck, President & CEO

Dear Ladies and Gentlemen, dear Shareholders, dear Colleagues,

2022 was a very special year for ANDRITZ. We were proud to be celebrating our 170th anniversary. 170 years of changing history where – between crises and wars – there was often a very fine line between success and failure, and where the determination, reliability and perseverance of all employees ultimately made ANDRITZ what it is today: a globally leading technology group with a long tradition and an excellent reputation among its customers all over the world.

Our company is outstanding due to its enormous diversity: the international ANDRITZ team with around 29,100 employees, companies rich in tradition – some of the companies in our group also celebrated special anniversaries in 2022 – combined with young, innovative startups, and the different customer markets we serve that have long-term growth potential. Tradition meets innovation!

This sense of tradition in conjunction with the will of our employees to constantly expand their capabilities and go the extra mile is another essential reason why ANDRITZ was able to close the 2022 business year with the best operating result in its 170-year history – in spite of the numerous challenges, such as the war in Ukraine, the sanctions on Russia, the dramatic increase in energy and material prices, and the considerable disruptions in global supply chains.

As a result, revenue increased to a new record level of 7.5 billion euros in 2022. At over nine and and almost ten billion euros, respectively, order intake and order backlog also achieved new record levels. In spite of sharply rising procurement costs for raw materials and semi-finished goods, the Group's profitability – the EBITA margin – amounted to 8.6% in 2022 and was thus higher than the peak value achieved in the previous year. Our staff in Purchasing have done excellent work in this field, just as our colleagues have done who are working on customer projects worldwide, pushing the execution of our orders forward largely on schedule in spite of all the adverse effects on supply chains and the travel restrictions still applying in places due to the COVID pandemic. Thank you to these great teams!

By acquiring the Sovema Group, Italy, and ĐURO ĐAKOVIĆ TERMOENERGETSKA POSTROJENJA d.o.o. (DD-TEP), Croatia, we have further extended our product portfolio in the e-mobility and renewable energy sectors.

Sovema is one of the leading international suppliers of manufacturing solutions for high-grade battery cells. Its customers include major companies in the automotive sector and some of the best-known battery manufacturers worldwide. Together with Schuler, Sovema will develop →

“We can make a substantial contribution towards climate and environmental protection, especially in the area of decarbonization.”

the machinery and systems that gigafactories all over the world need for mass production of lithium-ion batteries. These batteries must be available in large numbers if electromobility is to be a success.

DD-TEP supplies complete, turnkey power stations that produce power and heat from renewable biomass and waste. The company’s state-of-the-art production facilities offer highest quality in the manufacture of pressure parts and auxiliary boiler equipment.

I look to the 2023 business year with optimism. Our record order backlog gives us a solid workload for the coming year. On the one hand, the focus lies on executing our customer orders on schedule, and on the other, on creating sustainable organic growth. We intend to achieve this by continuing to push ahead with our research and development work. The main focus here is to expand and further develop the extensive range of sustainable products and solutions that we provide to help our customers achieve their sustainability goals.

With our four business areas serving many different industries that have long-term megatrends such as renewable energy sources, decarbonization, e-mobility and the circular economy, we have four solid foundations and are well positioned strategically for the future. We can make a substantial contribution towards climate and environmental protection, especially in the area of decarbonization. Here we should mention our turbines and generators for hydropower plants, recovery and biomass boilers for generating renewable energy, technologies for the production of biomethanol and for carbon capture from flue gases, products for electromobility and the circular economy, production technologies for alternative proteins, and our developments in connection with green hydrogen, among other products. And in terms of the digitalization megatrend, we have a broad product offering in our Metris platform, which targets current market needs with remote maintenance, process optimization, digital twins and cyber security, opening up large opportunities for us in the future.

But we also have our own ambitious goals in terms of sustainability. By 2025, we intend to halve our CO_2 footprint compared to 2019 and also significantly reduce water consumption and the amount of waste produced. We are on the right track here and have already implemented many measures. An important step was taken when our locations in Austria and Germany switched entirely to green energy. Another will be achieved when we fit out our production shops with photovoltaic systems.

In addition to focusing on organic growth, the acquisition of companies that complete or complement our product portfolio remains one of our main goals. With gross liquidity of slightly above two billion euros and high generation of free cash flow, we have sufficient financial means to seize suitable opportunities to acquire additional companies at any time.

I would like to express my warmest thanks personally to all employees, customers and shareholders for the trust they have placed in me and ask all of you to also remain loyal to ANDRITZ in the future. ■

Joachim Schönbeck, President and CEO

MORE KNOW-HOW

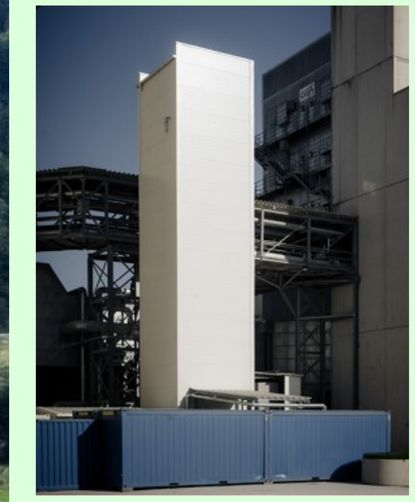
ANDRITZ has delivered the first CO_2 capture plant for the German cement industry to Rohrdorfer Zement. It has been adapted to the needs of the company to best advantage and was planned and built within a very short time.

LOWER CO_2 EMISSIONS

The plant is able to capture two tons of CO_2 per day, which is then used as a valuable resource in chemical plants and breweries. Rohrdorfer plans to increase this figure to 1,500 tons per day. The pilot project makes an important contribution towards achieving the German cement industry's goal of being able to produce climate-neutral cement by 2050.

"CO-CREATION IS THE MAGIC WORD."

The 21-meter-high tower on the premises of Rohrdorfer Zement in Upper Bavaria doesn't look very impressive at first sight. But it contains something quite sensational: Germany's first CO_2 capture plant for cement production. The facility was built in close collaboration with ANDRITZ and captures two tons of carbon dioxide per day. But that is only the beginning. Helmut Leibinger, head of the Net Zero Emissions team, and Günther Wunsam, Commercial Manager of the Cement Division, explain why the project is groundbreaking and what plans Rohrdorfer has for the future.



Rosenheim,
Upper Bavaria

Rohrdorfer Zement's head office near Rosenheim in Upper Bavaria. Top left of the picture: the CO_2 capture plant from ANDRITZ

Left: CO_2 capture plant supplied by ANDRITZ
Right: Helmut Leibinger (l.) heads the 16-member Net Zero Emissions team.
Günther Wunsam (r.), Commercial Manager of the Cement Division

"We want to achieve CO_2 savings of 65 percent by 2030."

Mr. Wunsam, the German cement industry wants to achieve climate-neutral production by 2050. What is next on the agenda at Rohrdorfer?

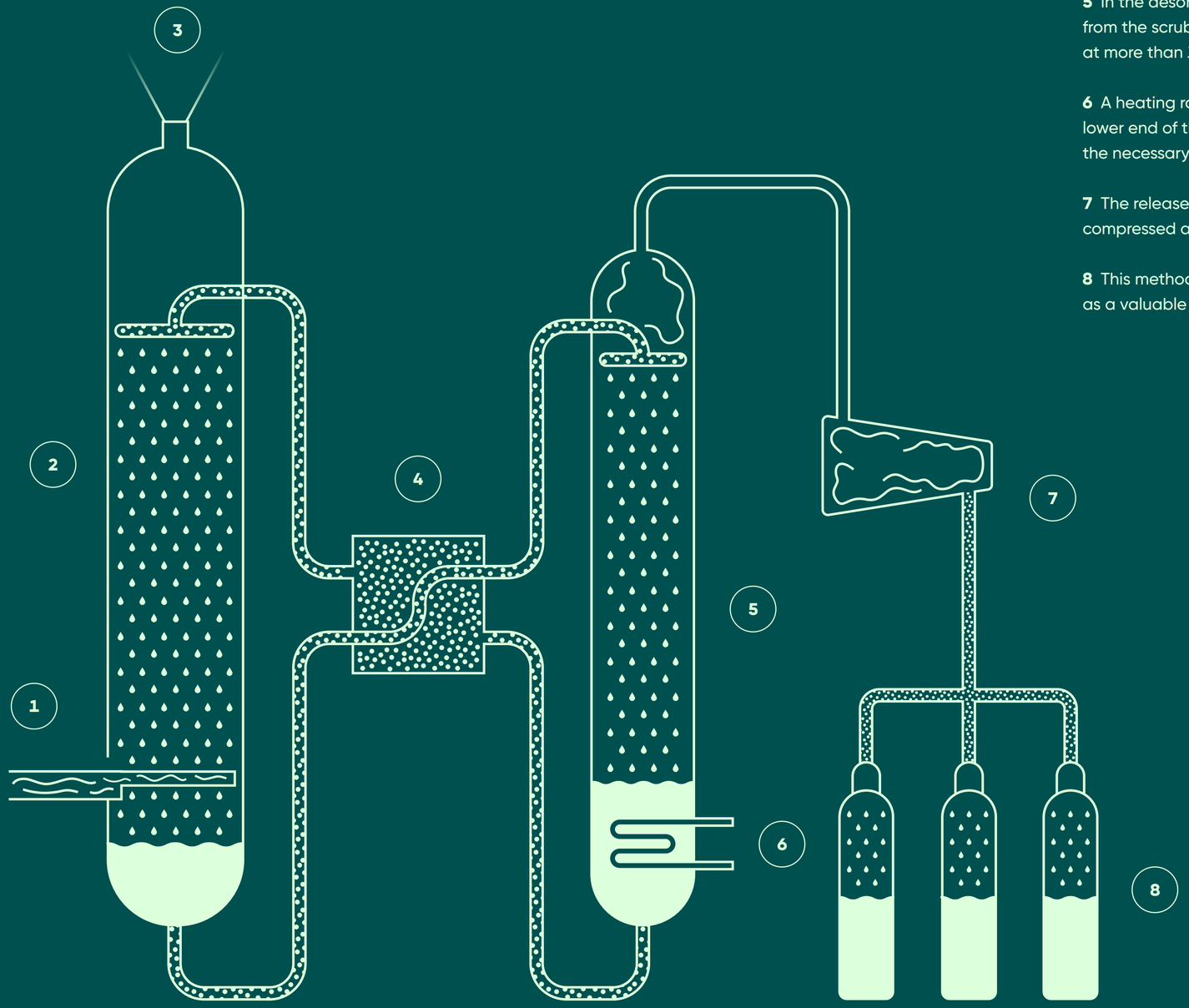
GW We want to be faster than that and aim to decarbonize our production by 2040. This is ambitious, but I believe we are on track. In 2022, we were producing cement here with 45% less CO_2 than in 1990. This succeeded because we optimized the types of cement and use of the fuels. We want to achieve savings of 65% by 2030. The remaining 35% of the CO_2 will be used as a valuable resource – which brings us to our pilot plant.

How are you going to do this?

GW In principle, the carbon in the CO_2 can be further processed to produce methanol, ethylene or formic acid. In this way, products can be obtained that are mainly produced today using mineral oil. So the bottom line is, if we look at and use CO_2 as a source of carbon, we are protecting the climate and making companies less dependent on mineral oil and natural gas. In turn, this opens up new business segments for Rohrdorfer. →

FROM A PROBLEM TO A VALUABLE RESOURCE

Carbon dioxide makes a significant contribution towards global warming. In addition to increases in efficiency, energy savings and the use of renewable energy sources, CO_2 capture also helps to reduce emissions. Overview of the ANDRITZ technology:



1 After denitrification (NO_x), desulfurization (SO_2) and dedusting (particles), the exhaust gas from the lime kiln is cooled and brought to a CO_2 capture unit.

2 In the absorber, the CO_2 is removed from the flue gas at 40° C by means of a scrubbing liquid. In order to speed up the transfer of CO_2 to the scrubbing liquid, the absorber contains internal parts that enhance absorption.

3 The gas, from which the CO_2 has largely been removed, is discharged into the environment. It now mainly comprises nitrogen (N_2), oxygen (O_2) and steam (H_2O).

4 The heat exchanger is used to heat up the enriched scrubbing liquid and cool down the lean liquid.

5 In the desorber, the CO_2 is released from the scrubbing liquid with steam at more than 120° C.

6 A heating rod is mounted at the lower end of the desorber to provide the necessary heat.

7 The released carbon dioxide is compressed and filled into gas bottles.

8 This method produces pure CO_2 as a valuable raw material.

Heavy equipment is essential in cement production (left).
Helmut Leibinger and Günther Wunsam on an inspection tour of the extensive company premises (right)

Mr. Leibinger, can you explain this in a little more detail?

HL In our pilot plant, we remove the CO_2 from the flue gas produced in our cement process fully automatically and store it in special steel bottles. We then deliver these bottles to the chemical industry or to breweries, for example. There is considerable interest in both sectors. The formic acid recovered from the carbon dioxide capture is used as the basis of cleaning and de-icing agents and similar products. In addition, the gas can be used to increase the carbon dioxide content of mineral water. That is why we make a point of ensuring that our CO_2 is of food grade.

How much do you intend producing in the medium term?

HL In the next expansion stage of the facility, we will capture 48 tons a day. In the medium to long term, we have plans to recover 1,500 tons per day. The crucial factor in expansion of the facility is the maximum amount of energy available for the scrubbing process. That is why we are working very hard to make this process more and more efficient with the aid of heat pumps and heat recovery as well as by purchasing electricity from renewable sources in the future. →

1,500 t

That's how much CO_2 Rohrdorfer Zement wants to capture every day in a few years' time – 750 times more than the company captures today.

Rohrdorfer Zement
produces high-grade building materials to cover regional demand at 142 locations in Germany, Austria, Italy, and Hungary. The product range comprises cement, ready-mixed concrete, prefabricated parts and concrete goods as well as sand and gravel. The company has 2,130 employees and considers itself a pioneer on the road to achieving CO_2-neutral production of building materials. Rohrdorfer was among the first to use a scrubbed gas catalytic converter for denitrification and, with the aid of a power station, convert the waste heat from cement production into electricity.

Limestone is one of the raw materials in cement, which is used to produce one of the most important building materials in the modern world: concrete.

Your partner in this mission is ANDRITZ. How would you rate this collaboration?

HL We are very pleased with it. We kept exactly to the schedule and were even ahead of it at times, all this in spite of delivery problems during the COVID crisis. Right from the beginning, we had the impression that we were being heard and not just having a supposed solution imposed from above. ANDRITZ adapted the capture process to our individual needs in order to achieve optimum CO_2 purity and longevity of the chemical solvent used for capture purposes. When you build and operate a pilot plant, you experience something new almost every day. ANDRITZ is helping us in these endeavors.

GW Decarbonization of our industry is a mammoth task. It is comparable to the enormous technological efforts made in the 1960s to put a man on the moon. The principal goal – being CO_2-neutral – can only be achieved if companies collaborate closely, join forces and create something new. Co-creation is the magic word. Our CO_2 capture plant is a case in point that this can succeed. ▲

MORE INNOVATION

The Brazilian company Klabin has started up an innovative sulfuric acid plant supplied by ANDRITZ – SulfoLoop enables the production of commercial-grade sulfuric acid from the mill's odorous gases. This solution is completely new to the pulp and paper industry.

LOWER GREENHOUSE GAS EMISSIONS

SulfoLoop strongly supports Klabin in its circular economy initiatives. By producing sulfuric acid in-house, the costs for externally purchased sulfuric acid are much lower. In addition, indirect CO_2 emissions are reduced: Fewer truck journeys are needed to transport sulfuric acid to the mill.

By far the largest part of the Amazon rainforest is located in Brazil. It offers enormous bio-diversity and stores huge amounts of CO_2. The rainforest plays a central role in combating global warming.

EVERYTHING COUNTS

The Brazilian pulp and paper producer Klabin wants to make optimum use of the by-products generated in its mills and significantly reduce greenhouse gas emissions. Thanks to the SulfoLoop solution supplied by ANDRITZ, which operates according to the so-called wet-gas sulfuric acid process, the company is moving closer to both goals: a plant producing sulfuric acid from gases that form in the mill itself.

Klabin pulp plant in Ortigueira, Paraná state

100 t

Klabin currently produces 100 tons of high-purity sulfuric acid daily. The Ortigueira plant is the world's first facility in the pulp industry to produce commercial-grade, concentrated sulfuric acid from gases generated at the mill itself.

The term circular economy is often mentioned when talking about sustainable modernization of industrial production. And it is also an ecological idea to close material and energy loops completely and so skillfully that energy input, emissions and waste are reduced to a minimum – ideally coming close to zero in the final stage. But how can this good idea become reality?

At the Ortigueira mill operated by pulp and paper maker Klabin in southern Brazil, we can observe how operations are drawing closer to the circular economy step by step. Here, the first plant in the pulp industry worldwide will produce commercial-grade, concentrated sulfuric acid from concentrated, odorous gases, which are generated at the mill itself. ANDRITZ was responsible for engineering, procurement, construction and commissioning of the plant at the Klabin mill and has been one of the Brazilian company's main suppliers for many years. →

“We are constantly looking for ways of making use of the by-products from our mills.”

Left: João Braga is Klabin’s director of engineering and projects and has been with the company for more than 40 years. Right: Francisco Razzolini has been working at Klabin since 1985 and is the executive director responsible for research and development, innovation, sustainability and automation technology.

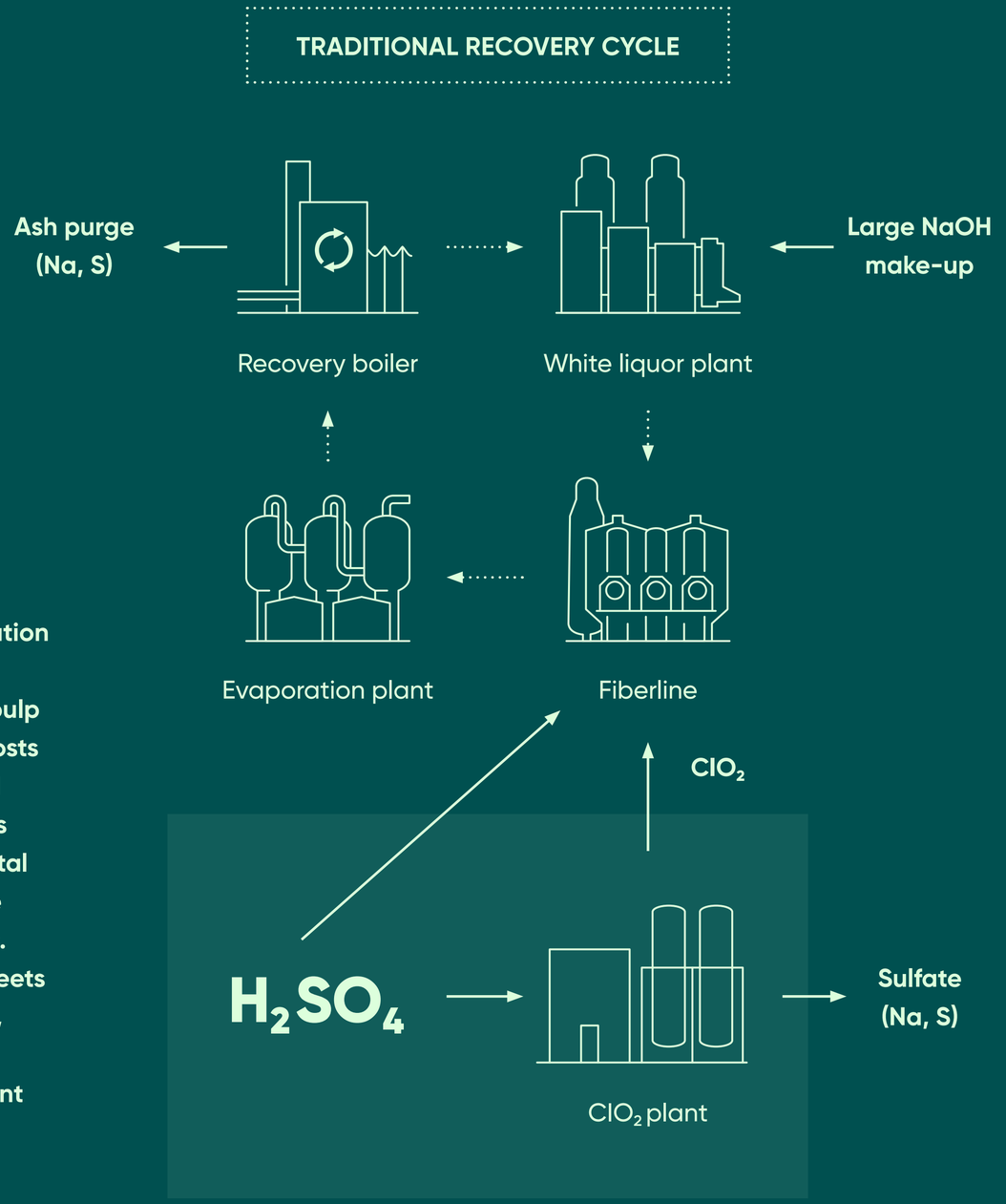
At the moment, around 100 tons of high-purity sulfuric acid are being produced per day. This figure is to increase by another 50% in the course of 2023. The plant will then supply the sulfuric acid essential to the pulp production process to pulp lines “Puma I” and “Puma II” at the Ortigueira mill and also to the neighboring Klabin mill 25 kilometers away – acid that previously had to be delivered under strict safety precautions with high labor input and high emissions.

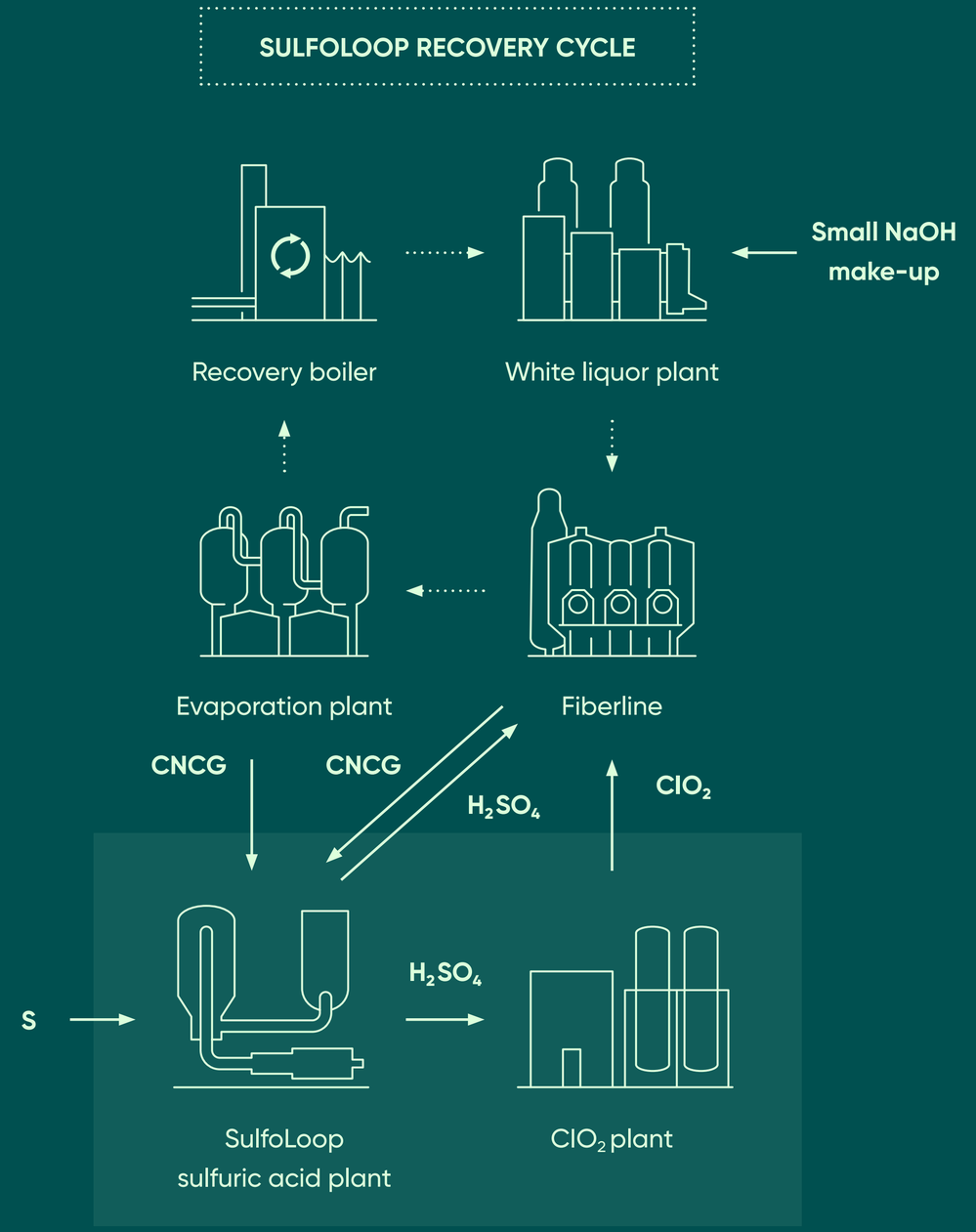
Fewer trucks, lower CO_2 emissions

“We are constantly looking for ways of making use of the by-products produced in our mills,” says Klabin’s Projects Director, João Braga. Oxygen, sodium chlorate and hydrogen are recovered in Ortigueira, and so are methanol, turpentine and tall oil. “But the sulfurous gases are definitely among the most important by-products,” Braga continues. “That’s why the sulfuric acid plant is a particularly good example of how we are closing our material loops with the aid of technology.” →

ANDRITZ SULFOLOOP SOLUTION

The ANDRITZ SulfoLoop solution creates an internal sulfuric acid production cycle in a pulp mill, which decreases the costs for make-up chemicals and reduces sulfur effluents. This enhances both environmental and economic performance of the kraft pulping process. As the sulfuric acid plant meets stringent air emission limits, the process significantly improves the overall footprint of the pulp mill.





“Production is stable and efficient. We are very pleased.”

Braga says that the plant has several advantages: First of all, Klabin no longer has to purchase any sulfuric acid and thus is not affected by any price increases or delivery problems. Secondly, as the most significant sulfur-rich stream is used to replace the purchased sulfuric acid, it allows the mill to recycle more streams containing sulfur and sodium, avoiding effluents. “And thirdly, we can reduce truck transport, which was vital to bring the sulfuric acid and sodium hydroxide to the mill, by up to 85%,” João Braga continues. Instead of having some five to six 30-ton trucks that have to cover 500 kilometers every day, only one is needed, thus saving a comparable amount of fuel and CO_2 emissions. “We are very pleased with the result,” says João Braga. Production is stable, efficient, and meeting all targets set. →

The technology of the new plant is based on the wet-gas sulfuric acid process developed by the Danish company and ANDRITZ partner Topsoe.

CIRCLE TO ZERO
Klabin's SulfoLoop sulfuric acid plant is a part of the ANDRITZ CircleToZero initiative. CircleToZero means analyzing all of the chemical loops in pulp production to see whether side streams can be used, recycled or refined to make new products.

The ultimate goal: decarbonization

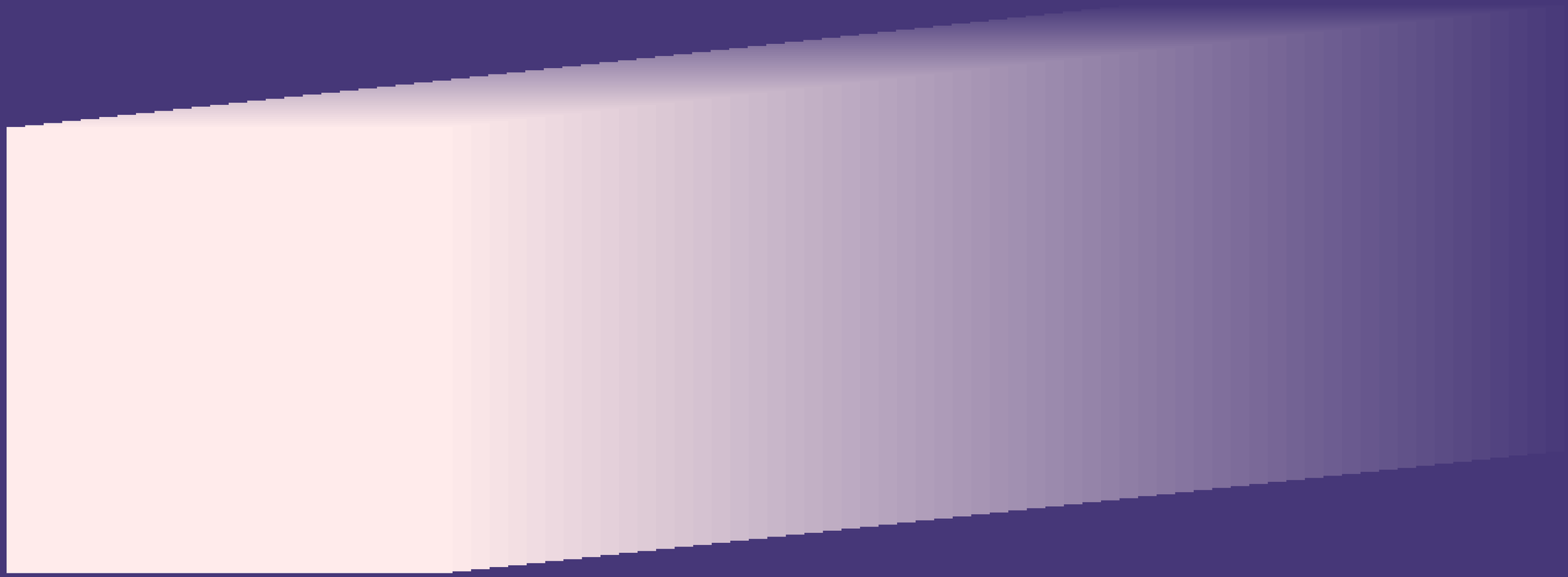
ANDRITZ was selected to build and start up the plant in view of the long-standing and trusting collaboration between the two companies, according to Francisco Razzolini, Director of Technology, Innovation and Sustainability at Klabin. "ANDRITZ knows pulp production, our mills and our work culture very well. These are essential requirements if you want to integrate new technology jointly for the first time." We have overcome many challenges together, from complicated planning and working during the pandemic to the extensive safety precautions and step-by-step optimization of sulfuric acid production.

Decarbonization is high up on Klabin's agenda, Francisco Razzolini underlines: "We have been investing in low-carbon technologies for a long time, such as gasification of biomass and production of tall oil." As a result, CO_2 emissions per ton of pulp, paper and packaging were reduced by two thirds between 2003 and 2021. These emissions are to fall by a further 49 percent by 2035 compared to levels in 2019. "This is an ambitious goal for us," says the Technical Director. "And we still have a long way to go before we achieve it." One of the stages of this journey is the new ANDRITZ SulfoLoop plant. ▼

andritz.com/ar22/klabin

MORE TECHNOLOGY

ANDRITZ has developed a new type of furnace with a series of technological improvements for voestalpine Wire Rod Austria GmbH in order to make heat treatment in wire rod production more efficient and more sustainable.



LOWER CO_2 EMISSIONS

The furnace is entirely electrically heated and does not cause any local greenhouse gas emissions from fossil fuels. In addition, up to 25% of the process energy input compared to conventional burners can be saved. A step towards green steel production.

The new chamber furnace from ANDRITZ does not produce any local CO_2 emissions and consumes significantly less process energy than other designs.

ON THE WAY TO GREEN STEEL PRODUCTION

The European steel industry is undergoing a technological revolution. It intends to break free from fossil fuels and also produce and process CO_2-neutral steel by 2050. With a new furnace design, ANDRITZ is already contributing today towards saving energy and reducing emissions.

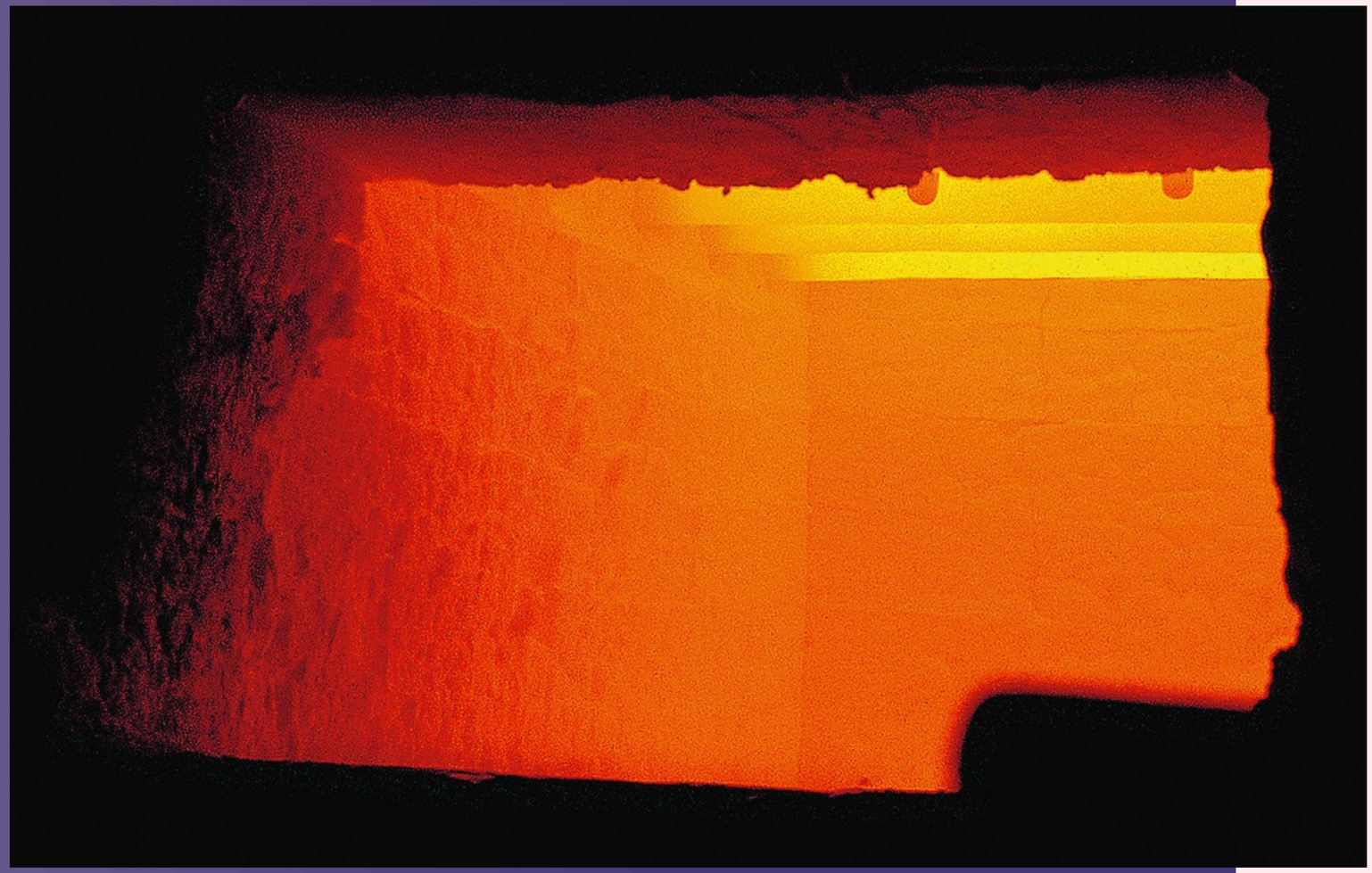
Donawitz, Styria

Donawitz, a district in the city of Leoben in Styria, has been making a living from iron ore for almost an eternity. Iron was also produced from the iron ore here 500 years ago. On an area the size of 21 soccer fields, voestalpine Stahl Donawitz GmbH, located in Donawitz, annually produces 1.65 million tons of high-grade steel that is used to make products for rail production, mechanical engineering and the automotive industry, for example.

voestalpine Wire Rod Austria GmbH has demanding customers, who require top quality and tightest tolerances combined with maximum flexibility. That's why there is considerable motivation to make the production process more efficient and also more sustainable. In parallel to this, there is a huge challenge to overcome: the step-by-step transition in technology to achieve CO_2-free production by 2050. →

Steel production has a long tradition in Donawitz. The 18-meter-long steel billets are heated up to 1,200° C.

1,200° C



Efficient heating by means of electrical radiant tubes (source: Kanthal)

No emissions, lower energy consumption

With a new plant design to homogenize steel, ANDRITZ has been helping voestalpine Wire Rod Austria GmbH on one leg of this journey. In steel production, homogenization means the process to provide the raw material with consistently high quality. To put it simply, the steel is heated to a temperature that gives it a homogeneous microstructure at the atomic scale. "We can look back on many years of successful collaboration with ANDRITZ on different projects," Axel Grabmeier, voestalpine Wire Rod Austria GmbH, describes how this collaboration came about. "Due to this experience and the innovative, new design as an alternative to the classic hood-type furnace, ANDRITZ was awarded the order." →

"Heating with electricity is generally more efficient than heating with fossil fuels."

ANDRITZ designed and built a huge chamber furnace with a chamber volume of more than 100 cubic meters. It can heat dozens of 18-meter-long steel billets homogeneously to 1,200 °C and then cool them down again – in one and the same chamber. The design has various advantages: The unit is heated entirely by electricity, meaning that there are no gas burners used and thus no direct CO_2 emissions are caused. In addition, the furnace uses up to 25% less process energy compared to furnaces operated with conventional burners. Furthermore, it is operated with a special cover gas that protects the edges of the steel billets against decarburization. Hence, there are no large amounts of metallic scrap. And finally, the energy to be discharged during the cooling process is stored in a hot-water loop and used for other processes in the mill.

Efficient and economical

"The approach with 100% electric heating enables us to heat without using natural gas," Gunter-Franz Korp underlines. "Using green energy is our top priority. voestalpine Wire Rod Austria GmbH only purchases certified green electricity that is generated sustainably." This has a favorable impact when it comes to CO_2: "Heating with electricity is generally more efficient than heating with fossil fuels. In terms of emission categories, operating this type of furnace provides significant savings in direct CO_2 emissions that would have been produced by fossil fuels," says Gunter-Franz Korp. →

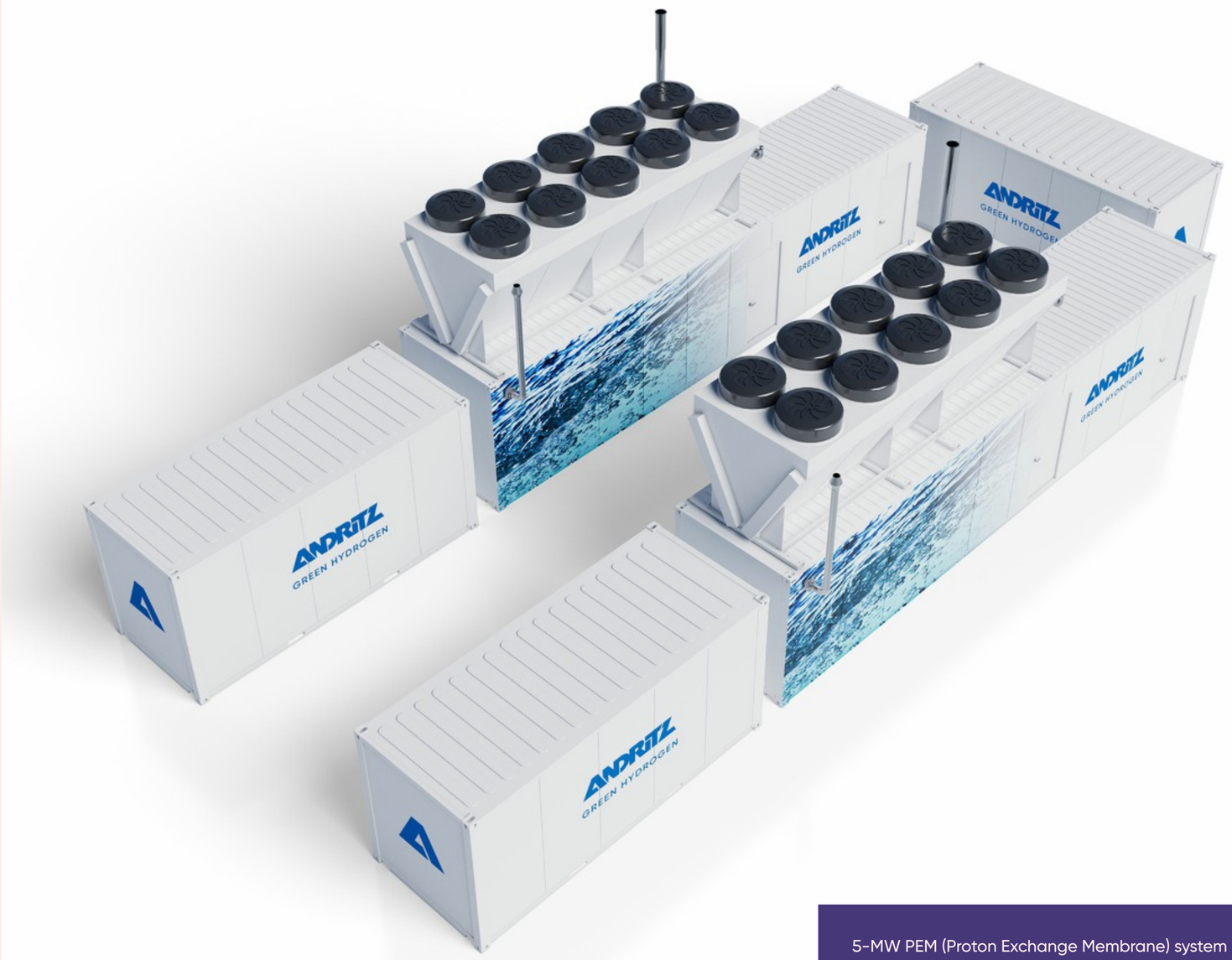
"We can look back on many years of successful collaboration with ANDRITZ on different projects."

Axel Grabmeier, voestalpine Wire Rod Austria GmbH

"ANDRITZ supports the steel industry on the road to producing CO_2-neutral steel."

The furnace is an important element in the long-term goal of decarbonization in steel production. More and more companies are planning to produce CO_2-neutral steel in the future with the aid of green hydrogen, and this gas is also seen as an energy carrier of the future in other branches of industry. The Hydrogen Council for example, a global initiative by leading companies, expects production of green hydrogen to increase from 0.7 million tons a year in 2020 to 300 million tons in 2050. In addition, the European Union is promoting further development of innovative hydrogen technologies as part of the Green Deal. ANDRITZ is actively accompanying and shaping this development – as a supplier of electrolyzers to generate green hydrogen from renewable sources like wind, solar or hydroelectric energy, as a manufacturer of systems for highly automated fuel cell production, or as a partner for new burner solutions (H_2-ready or electric). The transition is in full swing. ■

andritz.com/ar22/voestalpine



5-MW PEM (Proton Exchange Membrane) system using 2x2.5 MW modules housed in containers and producing 1,000 Nm^3 of hydrogen per hour

MORE HYDROPOWER

The generating capacity for renewable energy, including hydropower, will have to be increased drastically in the next few years in order to reach the climate goals.

LESS CO_2

The level of carbon dioxide emissions can be lowered effectively with the aid of hydropower. An example illustrates this: Ryburg-Schwörstadt hydroelectric power station generates an average of approximately 760 GWh per year, contributing to an emissions reduction of around 600,000 tons of CO_2 annually.

WITH THE FLOW

Hydropower has made a significant contribution towards generating clean, renewable energy for many years. It currently produces more than half of the renewable power worldwide. In view of the challenges of climate change and the urgent need to substantially reduce CO_2 emissions, there are many good reasons to also continue focusing on hydropower, as two very different ANDRITZ projects demonstrate.

Hydropower – a technology with a vision – is the most proven and best developed form of renewable electricity generation, successfully deployed at hundreds of thousands of sites worldwide, and it helps to substantially reduce CO_2 emissions.

In spite of the rapid rise of renewable energy sources sources, for example wind power, biomass, solar power and geothermal heat, hydropower is the largest source of renewable energy, with a share of just over 50 percent. And it has several advantages: Hydroelectricity can be generated flexibly and according to needs. Hence, the power grids can be stabilized and enormous quantities of volatile wind and solar power, which are not available on demand, can be stored with the aid of pumped storage power stations.

In regions where the demand for energy will increase most rapidly in the next few years – such as Asia, South America and Africa – new large-scale plants will be built and there will be numerous smaller hydropower projects. However, there is also enormous potential in Europe and North America to resolve the "trilemma" of secure supply, sustainability and affordability of energy. Approximately half of the plants there are over 40 years old. Modernizing and upgrading them can make a substantial contribution to the energy supply. →

Stability and safety
The 300-megawatt Nenggiri hydropower plant is currently the largest renewable energy project being implemented by operator TNB Genco in Malaysia. It will stabilize the national power grid and reduce the risk of downstream areas being flooded.

Nenggiri is located in the northeast of Malaysia. Around 1.8 million people live in the state of Kelantan.

The projects handled by around 7,000 ANDRITZ Hydro employees all over the world are proof of the opportunities that these two approaches offer. This is demonstrated in two examples – from Malaysia and Switzerland.

Dawn of the Modern Age

Kelantan is a state in northeastern Malaysia with a population of around 1.8 million. In order to develop the economy here, which consists largely of small local businesses, and meet the region's growing demand for energy, the new Nenggiri hydropower station is being built in the Gua Musang district and is to be completed by mid-2026. A consortium led by ANDRITZ will supply the entire electro- and hydromechanical equipment. The order comprises design, manufacture, delivery, installation, and commissioning of two 153-megawatt turbines and generators, together with the auxiliary equipment, and the complete electrical and mechanical balance of plant.

The hydropower facility is one of several government-approved projects that are to help increase the share of renewable energy in Malaysia to 40 percent by 2035. And the plant has other advantages: "It will help to stabilize the national grid at peak load and, thanks to its ability to store large quantities of rainwater during the monsoon season, it will also play an important role in flood mitigation," says Dato' Nor Azman Mufti, Managing Director of TNB Genco, the Malaysian customer and operator of the plant. In addition, the population will benefit from a better supply of clean water. →

"ANDRITZ is a professional partner and provides excellent services. We are working together on a basis of trust."

Dato' Nor Azman, Managing Director of TNB Genco

The Ryburg-Schwörstadt run-of-river power plant is the most powerful facility on the High Rhine and supplies both Switzerland and Germany with electricity.

Good for human beings and wildlife
Ryburg-Schwörstadt is leading the way when it comes to reconciling ecological, economic and social issues. Around 20 million euros were invested to implement an array of projects. Among other things, a bypass watercourse was created to ensure smooth fish migration (on the left in the picture).

For TNB Genco, which already operates three hydroelectric schemes in Malaysia, currently with a total capacity of 2.54 gigawatts, this is the largest individual project for renewable energy to be implemented by the group at the moment. "Nenggiri guarantees a safe, reliable and sustainable supply of electricity for the population and the country as a whole," says Dato' Nor Azman. "In the long term, the project can also contribute to the socio-economic development of the region, in aquaculture, for example, or ecotourism." During the peak phase of construction work, the hydropower station will also create around 2,000 jobs for the local population and indigenous communities (Orang Asli).

For a sustainable future
Around 11,000 kilometers from Kelantan as the crow flies, on the border between Germany and Switzerland, hydropower is also the first choice. And has been for 92 years. With an installed capacity of 120 megawatts, Ryburg-Schwörstadt is the most powerful run-of-river hydropower plant on the "Hochrhein". The stretch of the river between Lake Constance and Basle has a 150-meter difference in altitude over →

“We are proud that sustainability really is practiced here, even across national borders.”

a distance of 150 kilometers. Eleven dams make use of this differential. Ryburg-Schwörstadt power station alone generates around 760 GWh of eco-friendly electricity a year.

ANDRITZ was awarded the order to extensively refurbish all four Kaplan turbines here by 2027, including design, engineering, manufacture of new parts, factory overhaul, installation, testing and commissioning. The aim of this rehabilitation project is to guarantee the service life and operational safety up to the end of the concession period, which was extended until 2070 a few years ago.

“We are making the plant into a state-of-the-art facility, increasing its efficiency, and we can use it more effectively than ever in future in all operating modes,” says Beat Karrer, Managing Director of Ryburg-Schwörstadt AG power station. Particular attention was paid to ecological aspects by installing oil-free bearing systems on the wicket gates and oil-free hubs for the new runners. “In this way, we can reduce the risk of oil accidentally leaking into the water, during operating disruptions for example, to virtually zero.” →

“FROM WATER-TO-WIRE” – HYDROPOWER BY ANDRITZ

Hydropower projects are technically demanding, complex and cost-intensive. They require technical know-how, experience, due care, and extensive knowledge of the region concerned. That is why many investors, project developers and customers rely on ANDRITZ.

What sets us apart:

180 YEARS
of experience in turbine design

7,000
employees at 65 locations and 10 test stands worldwide

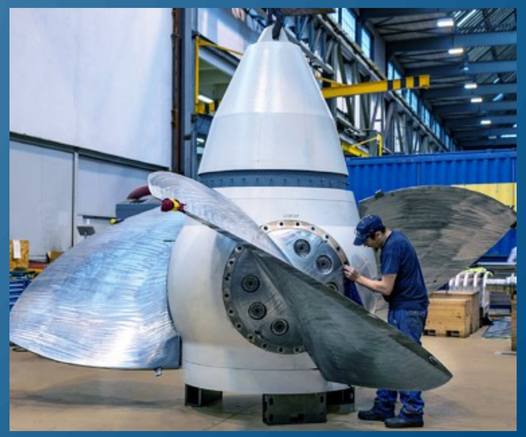
32,000
turbine units delivered

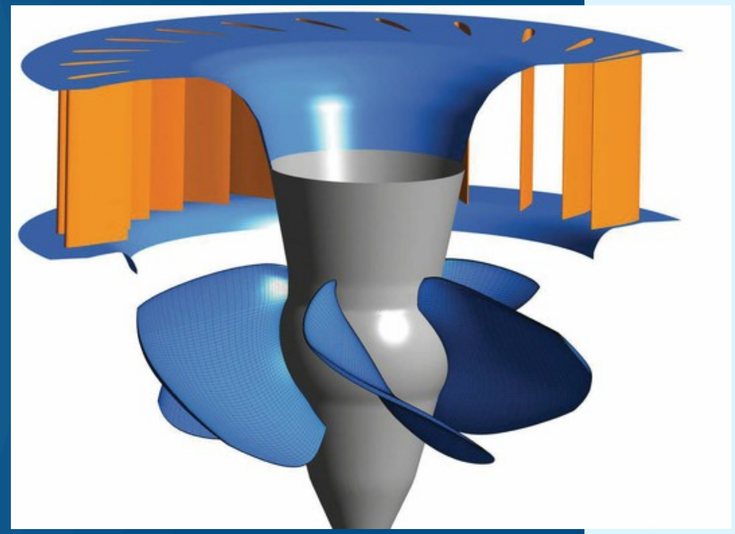
Complete portfolio for capacities up to more than
800 MW

471,000 MW
of installed and modernized capacity

The ANDRITZ subsidiary in Kriens, Switzerland, is responsible for project management, logistics and transport, engineering, installation, and start-up.

Manufacture of the new Kaplan impellers and factory overhaul of the large turbine components will be carried out at ANDRITZ's manufacturing facility in Ravensburg, Germany.





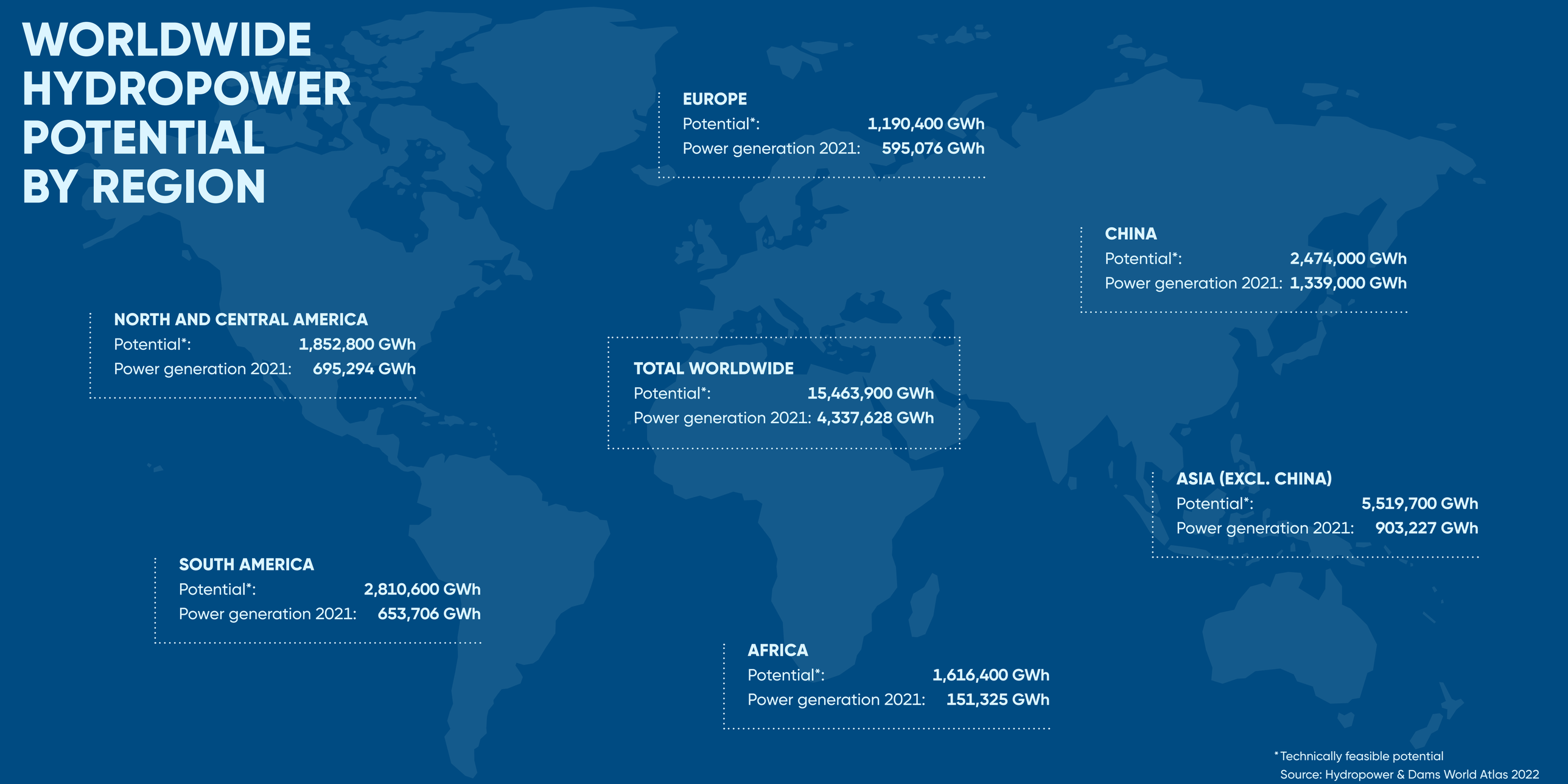
3D rendering for optimal turbine design. The impellers will be designed and the model tests conducted subsequently at the ANDRITZ site in Tampere, Finland.

Considerable efforts were also made elsewhere to harmonize ecological, economic and social aspects in Ryburg-Schwörstadt. "Over eight years ago, we installed an ecological advisory commission in which we debated, adopted and regularly assessed measures together with policy makers, environmental organizations and local residents," Beat Karrer explains. Around 20 million euros were invested in order to implement a whole set of measures: A bypass channel was built, for example, to guarantee unobstructed fish migration, compensation areas were created with exit points for wildlife in order to make it easier for animals to cross the Rhine, zones were set up to protect plants and small animals, and hiking trails were established.

"We are proud that sustainability really is practiced here, even across national borders," says Beat Karrer. "When efficient technologies, ecological will and economic efficiency work in harmony together, hydropower is an outstanding way of generating green energy."

andritz.com/ar22/hydropower

WORLDWIDE HYDROPOWER POTENTIAL BY REGION



EUROPE
Potential*: **1,190,400 GWh**
Power generation 2021: **595,076 GWh**

CHINA
Potential*: **2,474,000 GWh**
Power generation 2021: **1,339,000 GWh**

NORTH AND CENTRAL AMERICA
Potential*: **1,852,800 GWh**
Power generation 2021: **695,294 GWh**

TOTAL WORLDWIDE
Potential*: **15,463,900 GWh**
Power generation 2021: **4,337,628 GWh**

ASIA (EXCL. CHINA)
Potential*: **5,519,700 GWh**
Power generation 2021: **903,227 GWh**

SOUTH AMERICA
Potential*: **2,810,600 GWh**
Power generation 2021: **653,706 GWh**

AFRICA
Potential*: **1,616,400 GWh**
Power generation 2021: **151,325 GWh**

*Technically feasible potential
Source: Hydropower & Dams World Atlas 2022

GREATER EFFICIENCY

ANDRITZ has delivered a biosolids processing facility with a large drum dryer to the US environmental company Synagro and the city of Fort Worth, Texas. The plant will dewater 1.2 million gallons/day of liquid digested sludge and produce 110 tons/day of fertilizer granules.

LESS CO_2

Dried granules have a higher solids density and lower volume of water than those produced by belt filter presses, which results in a significant reduction in the weight of the final product. Hence, the CO_2 emissions associated with trucking the dried biosolids have dropped by more than 70%. But that's not all: Starting in 2024, the dryer facility will be fueled largely by biogas (digester gas) from the nearby wastewater treatment facility. This will further reduce the carbon footprint associated with biosolids processing operations.

VALUABLE WASTE

170 years ago, Fort Worth, Texas, was a tiny, dusty outpost of the US Army. Today, almost a million people live in the city – and the population is growing. ANDRITZ is helping to process the ever-increasing volume of wastewater by converting residuals into fertilizer – while at the same time reducing carbon emissions from biosolids operations.

Fort Worth, Texas

Modern wastewater treatment plants purify wastewater and help to recover valuable resources.

7,200 l

7,200 liters of wastewater are treated per second at the Village Creek Water Reclamation Facility.

The treated water can account for up to 95% of the Trinity River in dry months.

95%

Fort Worth, Texas, is an expanding city. Almost one million people live and work there, and there are only twelve larger cities throughout the USA. But as a city becomes more attractive to live in, the challenges it faces also increase. For example, when it comes to water management. It doesn't often rain in North Texas, and high temperatures above 40° C are not unusual in summertime. Thus, water is precious in Fort Worth.

The topic of wastewater has correspondingly high priority for the city authorities. In the Village Creek Water Reclamation Facility on the Trinity River in Fort Worth, more than 7,200 liters of wastewater are treated per second before being discharged into the river. During the dry months, the treated water can account for up to 95% of the river flow. In order to maintain river life and protect the river's function as a source of drinking water, optimum operation at the Village Creek Water Reclamation Facility is a must.

This also applies to the treatment of biosolids, a byproduct of the wastewater treatment process that contains nitrogen, phosphorus and other important nutrients. Fort Worth's priority is to beneficially reuse this valuable material, but do so in an innovative and economically prudent manner. Therefore, the city partnered with the US environmental company Synagro to install a sustainable solution for sludge treatment. →

“We are currently saving about 200,000 US dollars per month in operating costs.”

Synagro selected ANDRITZ to design, manufacture and deliver a plant that produces dried granules from the liquid sludge. The ANDRITZ high-performance decanter centrifuges dewater the liquid sludge and directly feed one of the largest and most efficient drum dryers in the world, evaporating up to 14 tons of water per hour. The dryer features a specially designed back-mixing system producing high-quality, homogeneous granules that are free of bacteria and pathogens, so-called “Class A biosolids”. The dried sludge granules are taken away on trucks and marketed by Synagro as first-class fertilizer.

Less volume, less CO_2

This solution also provides the city with several economic and ecological advantages. “At the moment we are saving around 200,000 US dollars a month in operating costs compared to operations with belt filter presses,” says Chris Harder, Director of the Fort Worth Water Department. “These savings will increase substantially upon completion of the new biogas pipeline from the Village Creek Water Reclamation Facility to the new drum dryer plant. The pipeline is scheduled to be completed in April 2024.” The biogas will then be used as a sustainable source of energy for drying operations. →

This illustration shows a typical DDS drum drying system from ANDRITZ. It is one of the oldest technologies in the sewage sludge drying sector and is characterized by high water evaporation and excellent end product qualities.

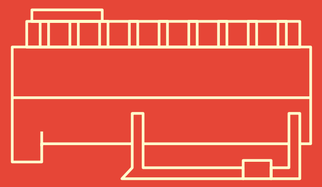
FROM LIQUID SLUDGE TO DRY GRANULES

The ANDRITZ equipment supplied to Fort Worth covers everything from thickening to dewatering and drying, as well as full process automation. It is a carefully orchestrated and well-proven solution for sludge treatment.

Sewage → Headworks → Primary treatment → Secondary treatment → Clarification → Tertiary treatment → Cleaned water

Automation

Metris addIQ control systems utilize IIoT technologies to transform data into customer benefit by combining smart sensors, data analytics and intelligent algorithms.



Thickening

ANDRITZ PowerDrum thickeners are particularly suitable for pre-digestion treatment or when land liquid spreading is planned.

Digestion

Dewatering

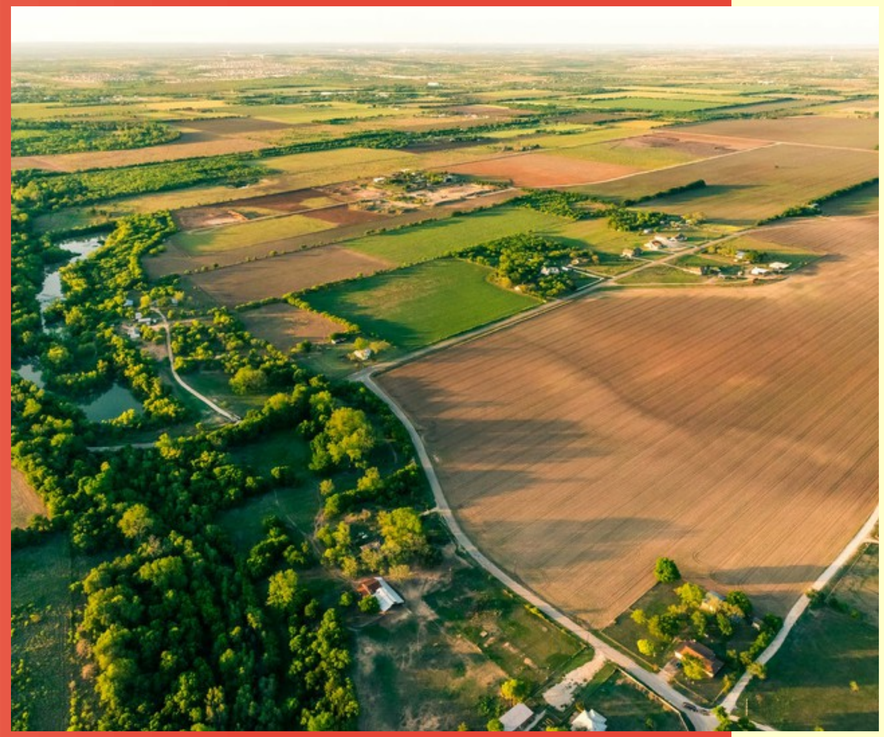
ANDRITZ decanter centrifuges make it possible to produce both thickened sludge and extremely dry filter cake from highly diluted sludge while maintaining energy efficiency.

Thermal treatment

ANDRITZ drum drying systems are a reliable and well-proven solution for thermal sludge treatment and provide drying and granulating in a single step.

Class A biosolids

Dried granules (Class A biosolids) made from liquid sewage sludge are very suitable as fertilizer (left), which is in demand in agriculture in the USA (right).



MINIMIZING

Drying provides an optimal way of treating sewage sludge. The process in which the water is evaporated at high temperatures disinfects the sewage sludge at the same time and reduces the volume by 70%. This results in a dried product that can be used as an organic fertilizer or a renewable energy source.

ABOUT SYNAGRO

Founded in 1986, Synagro Technologies has around 750 employees and collaborates with more than 1,000 municipal and industrial water and wastewater facilities in North America. For some, it is only about cleaning wastewater. Others, like the city of Fort Worth, work together with the Texan company to process waste into compost, fertilizer or fuel granules.

"A biosolids master plan was completed in late 2018 and includes a detailed analysis of how to best handle Fort Worth's biosolids for the next 20 years," Chris Harder continues. One big advantage of direct thermal sludge drying is that the granules have a much smaller volume than the wet sludge, which results in a significant reduction in the weight of the final product. "Hence, the CO_2 emissions from trucking activities have been reduced by 70%," explains Chris Harder. In combination with the new biogas pipeline and its carbon-neutral fuel, this will significantly reduce the overall carbon footprint of the biosolids processing facility.

Synagro takes a similar view of the project: "We are repeat purchasers of ANDRITZ technology solutions. The drying plant in Fort Worth is the eighth such plant that we are using," says Pam Racey, Vice President Project Development at Synagro. The ANDRITZ commitment, technologies and performance guarantees have also helped in this project to deliver an industry-leading recycling plant. "The drying technology is excellently suited to achieve Fort Worth's goals in terms of reliability, sustainability and cost-efficient production of a quality product."

andritz.com/ar22/synagro

THE ANDRITZ GROUP

EXECUTIVE BOARD AND SUPERVISORY BOARD OF ANDRITZ AG

The ANDRITZ AG Executive Board comprises five members, all of whom have many years of experience and specialist know-how in their respective areas of responsibility.

JOACHIM SCHÖNBECK
President and CEO
Pulp & Paper (Capital Systems), central group functions: Human Resources Management, Corporate Communications, Investor Relations, Group Quality and Safety Management, Group Site Installation, and Group Business Development

DOMENICO IACOVELLI
Metals, Group Information Technology, and Group Manufacturing Management

HUMBERT KÖFLER
Pulp & Paper (Service) and Separation

NORBERT NETTESHEIM
Central group functions: Controlling, Accounting & Taxes, Treasury, Order and Project Financing, Legal and Compliance, Internal Auditing, and Group Supply Chain Management

WOLFGANG SEMPER
Hydro, Group Automation & Digitalization, and Group Corporate Security

The ANDRITZ AG Supervisory Board consists of six members elected by the Annual General Meeting and three members delegated by the Works Council.

ALEXANDER LEEB
Chairman of the Supervisory Board

WOLFGANG LEITNER
Deputy Chairman

WOLFGANG BERNHARD
JÜRGEN H. FECHTER
ALEXANDER ISOLA
MONIKA KIRCHER

Delegated members:
GEORG AUER
ANDREAS MARTINER
ALEXANDER MORI

as of December 31, 2022

THE 2022 BUSINESS YEAR AT A GLANCE

NEW RECORD VALUES FOR ORDER INTAKE, REVENUE AND EARNINGS

ORDER INTAKE

The order intake of the ANDRITZ GROUP saw very favorable development in the 2022 business year and reached a new record level of 9,263 MEUR (+18% compared to 2021: 7,880 MEUR). All business areas were able to increase their order intake significantly compared to the previous year.

	Unit	2022	2021	+/-
Pulp & Paper	MEUR	4,378.7	3,774.7	+16.0%
Metals	MEUR	2,008.6	1,778.8	+12.9%
Hydro	MEUR	1,956.6	1,565.2	+25.0%
Separation	MEUR	919.5	761.0	+20.8%

REVENUE

The Group's revenue reached 7,543 MEUR, which is also the highest figure in the company's history (+17% compared to 2021: 6,463 MEUR). All four business areas succeeded in increasing their revenue – in some cases significantly – compared to the previous year.

	Unit	2022	2021	+/-
Pulp & Paper	MEUR	3,591.1	3,070.6	+17.0%
Metals	MEUR	1,621.2	1,366.1	+18.7%
Hydro	MEUR	1,539.0	1,345.1	+14.4%
Separation	MEUR	791.6	681.2	+16.2%

ORDER BACKLOG

The order backlog of the ANDRITZ GROUP amounted to 9,977 MEUR as of December 31, 2022, and was thus 22% higher than the reference figure for the previous year (December 31, 2021: 8,166 MEUR). All four business areas recorded a significant increase in order backlog compared to the previous year.

EARNINGS

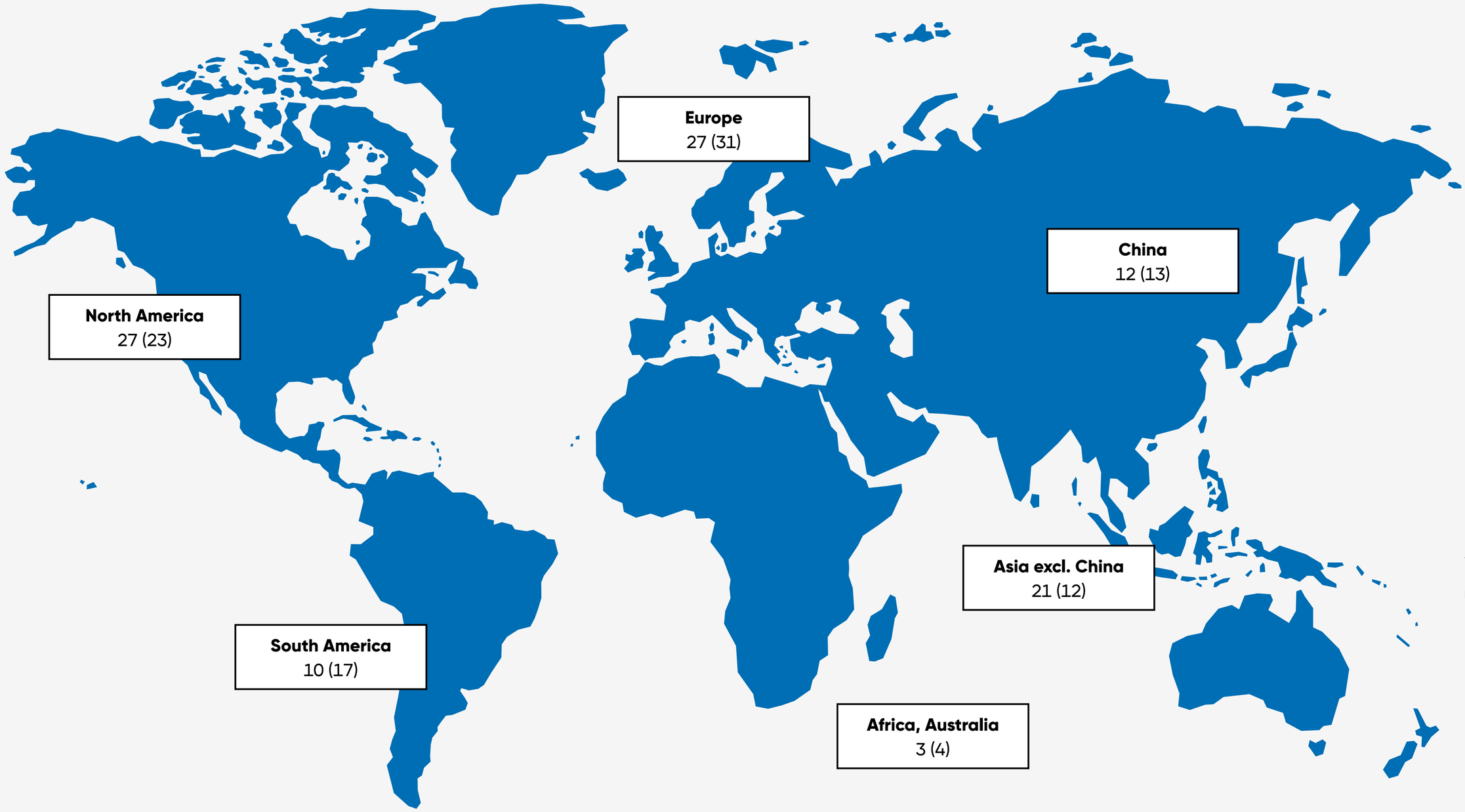
The Group's operating result (EBITA) increased in line with revenue and reached a new record level of 649 MEUR (+19% versus 2021: 547 MEUR), as did revenue. All four business areas recorded an - in some cases significant - increase in operating result. Profitability (EBITA margin) increased to 8.6% (2021: 8.5%).

NET WORTH POSITION AND CAPITAL STRUCTURE

Total assets amounted to 8,492 MEUR (December 31, 2021: 7,673 MEUR), while the equity ratio increased to 21.6% (December 31, 2021: 20.4%).

Liquid funds amounted to 2,051 MEUR as of December 31, 2022 (1,838 MEUR as of the end of 2021), and net liquidity increased significantly to 983 MEUR (703 MEUR as of the end of 2021).

ORDER INTAKE BY REGION 2022 (2021) IN %



2.1
billion euros
gross liquidity

9.3
billion euros
order intake

21.6
percent
equity ratio

STRATEGY

The business strategy of the ANDRITZ GROUP is oriented towards sustainably profitable growth. Its long-term goal has been defined as annual growth averaging 5–8% in revenue, at the same time increasing operating profitability (EBITA margin) sustainably to between 8 and 9%. ANDRITZ considers research and development, acquisition of companies with a complementary product portfolio, technological and cost leadership, expansion of the company's market position, and global presence to be the cornerstones in achieving this goal. A particularly important component in this business strategy is sustainability. With its extensive portfolio of sustainable products and solutions, ANDRITZ wishes to make the largest possible contribution towards a sustainable future and help its customers achieve their sustainability goals.

GROWTH AND PROFITABILITY

Research and development work is an important part of the ANDRITZ business strategy. Around 3% of the revenue is invested annually in innovation and in research and development, including order-related work of this kind. ANDRITZ seeks to offer its customers the most advanced and efficient technologies and products at all times. For this purpose, ANDRITZ works together with its customers to develop and test new products and processes in the company's own pilot plants.

Active ideas and innovation management is intended to promote employees' ideas in the best way possible and thus contribute towards developing new solutions. With intelligent technologies that create added value, ANDRITZ supports its customers as much as possible to help them achieve their business goals, at the same time also opening up new sales and growth opportunities for its own business areas. The acquisition of companies with complementary products and technologies is also one of the main cornerstones of the ANDRITZ business and growth strategy. By developing its own products and acquiring other companies, ANDRITZ is pursuing the ultimate goal of being a full-line supplier with global presence in all of its business areas. Furthermore, ANDRITZ focuses on continuous optimization of cost and organizational structures as well as further expansion of service business. →

"Research and development work is an important part of the ANDRITZ business strategy."

“ANDRITZ concentrates on markets with long-term and sustainable growth potential.”

TECHNOLOGICAL AND COST LEADERSHIP

All four business areas of the ANDRITZ GROUP number among the globally leading suppliers for their respective products and technologies. In order to strengthen this position, ANDRITZ must support its customers in achieving their goals in terms of productivity, quality, efficiency of resources and energy, and also sustainability – always with the very latest technologies. In order to be the preferred technology supplier at all times, while also maintaining a competitive cost structure, continuous cost optimizations are needed. A manufacturing and locations plan tailored to future market opportunities is also essential.

EXPANSION OF MARKET POSITION AND GLOBAL PRESENCE

ANDRITZ concentrates on markets with long-term, sustainable growth potential and, within these markets, on areas that are showing above average growth at a faster rate compared to the gross national product because they are driven by long-term socio-ecological trends or megatrends, such as renewable energy sources, decarbonization, the circular economy, alternative proteins, digital transformation or electromobility.

With a balanced mix of global and local presence, ANDRITZ can support its customers effectively in achieving their goals in terms of productivity, profitability and sustainability. ANDRITZ considers it essential to further expand its worldwide presence in order to utilize growth potential on the one hand, particularly in the emerging economies of South America and Asia, and on the other hand to be close to its customers in order to be able to guarantee the best possible and prompt service. Further outsourcing of manufacturing capacities to emerging countries enables ANDRITZ to profit from growth there, but also has positive effects on the economic growth and labor market in these countries. ■

THE ANDRITZ SHARE

SHARE PRICE DEVELOPMENT

Development of the international stock and financial markets was entirely overshadowed by the war in Ukraine and its impact on the global economy. High energy and raw material prices, bottlenecks and delays in the global supply chains, and the record inflation rates that all this causes put pressure on virtually all share indices on the main stock exchanges in Europe, the USA, and Asia. Furthermore, the rigorous interest policy pursued by the American and European central banks in order to fight the high inflation contributed substantially to the drop in share prices on the international stock markets.

In this stock exchange environment, the ANDRITZ share price developed favorably and increased by +18.0% in 2022. The ATX, the leading share index on the Vienna Stock Exchange, dropped significantly by 19% during the same period. The highest closing price of the ANDRITZ share was 54.55 EUR (December 14, 2022), and the lowest closing price 36.04 EUR (March 4, 2022).

LONG-TERM DIVIDEND POLICY

ANDRITZ pursues a dividend policy oriented towards continuity. Depending on how business develops and on any large-scale acquisitions, ANDRITZ's goal is to distribute an average of 50–60% of the net profit to the shareholders in the long term.

STABLE AND WELL-BALANCED SHAREHOLDER STRUCTURE

ANDRITZ has a stable and well-balanced shareholder structure. Around 31.5% of the ANDRITZ AG share capital is partly held directly and partly indirectly by Custos Privatstiftung and by Wolfgang Leitner, a member of the ANDRITZ AG Supervisory Board, respectively. 30.72% is owned by Custos Vermögensverwaltungs GmbH and 0.77% by Cerberus Vermögensverwaltung GmbH. With a free float of around 68.5%, national and international institutional investors and private investors make up the majority of the shareholders. Most institutional investors come from the UK, Austria, and Germany, while the bulk of the private investors are from Austria and Germany.

TRANSPARENT COMMUNICATION POLICY

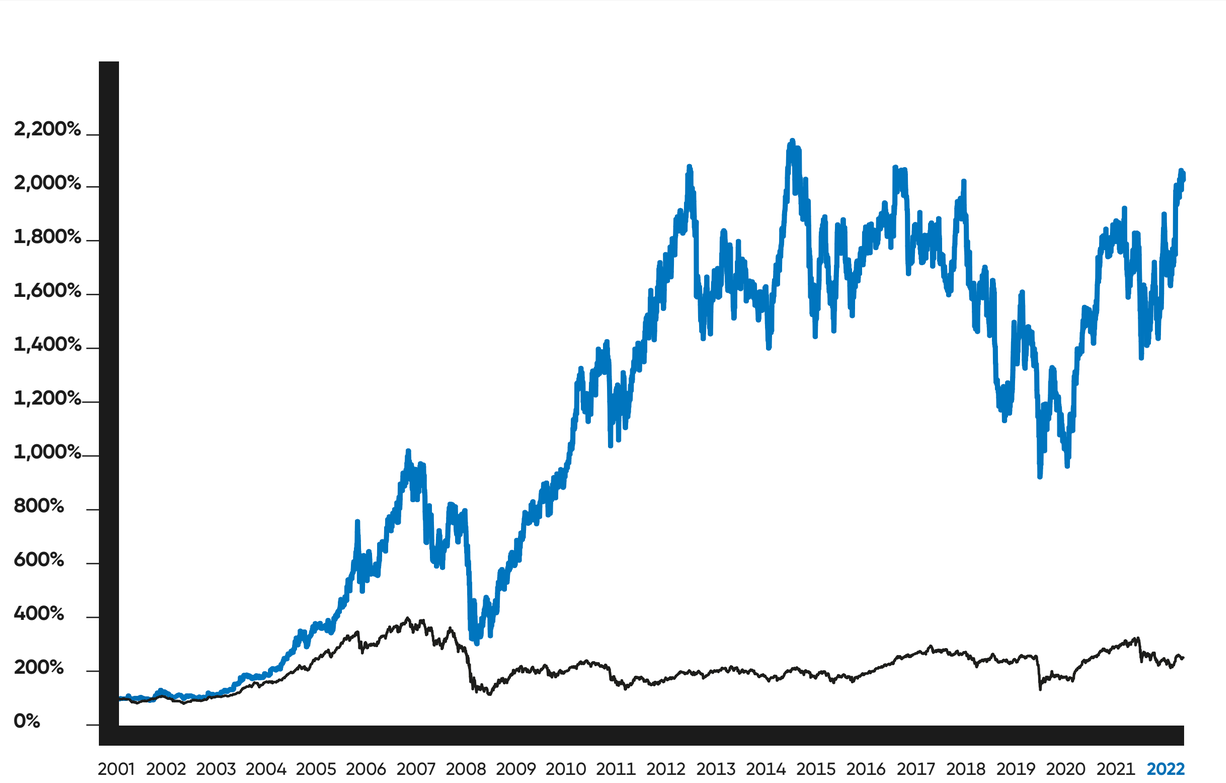
Regular and transparent communication with institutional and private shareholders has been the focus of investor relations activities since the ANDRITZ IPO in 2001. In 2022, ANDRITZ took part in many roadshows and investor conferences, most of which were held online. In addition, the Investor Relations team conducted numerous video and conference calls to inform investors and analysts about the main key figures, the company's strategic and operative development, current events and the impact that the war in Ukraine and also the COVID-19 pandemic have had on the individual markets, and about current ESG topics.

BROAD RESEARCH COVERAGE

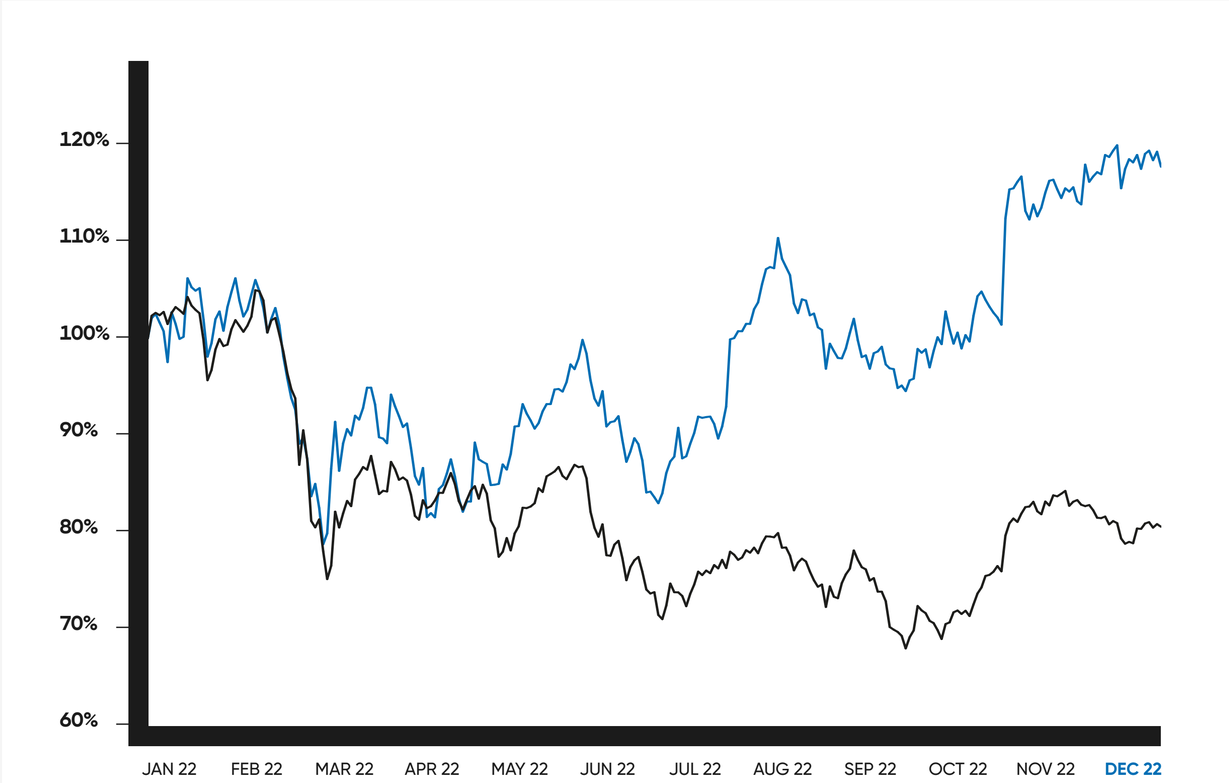
In addition to overall economic and company-specific considerations, the recommendations and share price expectations voiced by analyst firms play an important role in investment decisions by shareholders. The following international banks and investment houses publish analysis reports on ANDRITZ at regular intervals: Baader Bank, BNP Paribas Exane, Deutsche Bank, ERSTE Bank, Hauck & Aufhäuser, HSBC Trinkaus, J.P. Morgan, Kepler Cheuvreux, Raiffeisen Bank International, UBS, Warburg Research, and Wiener Privatbank.

The latest information on research coverage and consensus estimates is available on the Investor Relations page of the ANDRITZ web site andritz.com/research-coverage. ■

RELATIVE SHARE PRICE PERFORMANCE OF THE ANDRITZ SHARE VERSUS THE ATX SINCE THE IPO

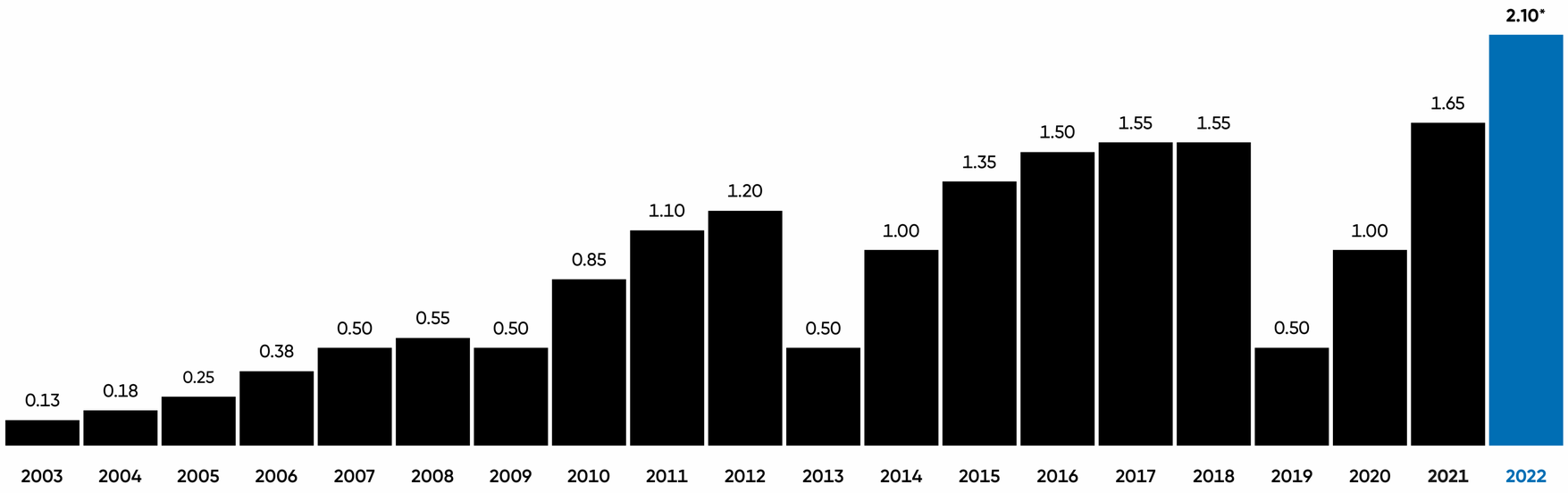


RELATIVE SHARE PRICE PERFORMANCE OF THE ANDRITZ SHARE VERSUS THE ATX IN 2022



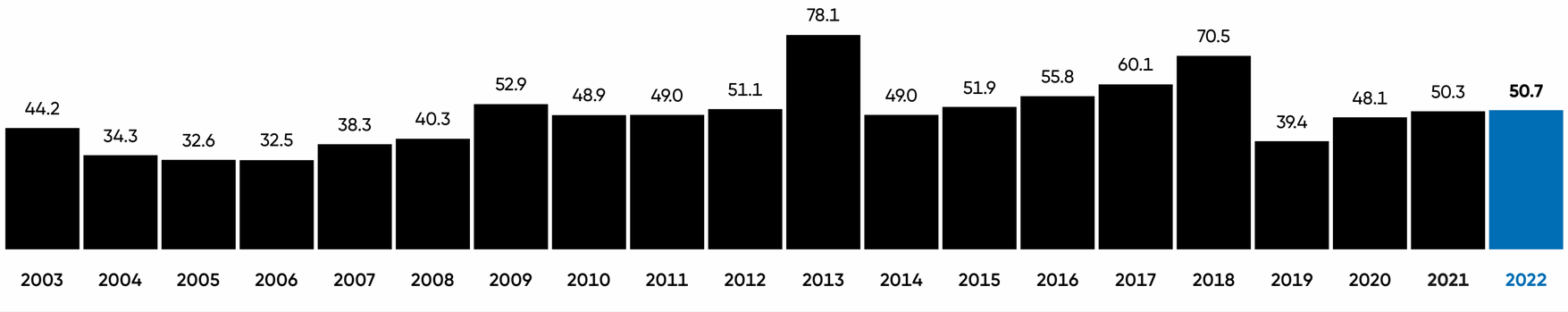
ANDRITZ ATX

DEVELOPMENT OF THE DIVIDEND PER SHARE 2003–2022



* Proposal to the Annual General Meeting

DEVELOPMENT OF THE PAYOUT RATIO 2003–2022



Average payout ratio (2003-2022): **48.9%**

KEY FIGURES OF THE ANDRITZ SHARE

	Unit	2022	2021	2020	2019	2018
Earnings per share	EUR	**4.14**	3.28	2.08	1.27	2.20
Dividend per share	EUR	**2.10**[1]	1.65	1.00	0.50	1.55
Payout ratio	%	**50.7**	50.3	48.1	39.4	70.5
Price-earnings-ratio (based on the year-end closing price)	–	**12.93**	13.84	18.02	30.24	18.24
Equity attributable to shareholders per share	EUR	**18.69**	15.86	12.64	12.05	13.02
Highest closing price	EUR	**54.55**	50.85	38.82	45.06	53.50
Lowest closing price	EUR	**36.04**	36.66	24.36	29.88	38.88
Closing price at year-end	EUR	**53.55**	45.38	37.48	38.40	40.12
Market capitalization (at year-end)	MEUR	**5,569.2**	4,719.5	3,897.9	3,993.6	4,172.5
Performance	%	**+18.0**	+21.1	–2.4	–4.3	–14.8
ATX weighting (at year-end)	%	**7.7744**	5.3766	6.1243	5.6622	7.1045
Average trading volume[2]	Shares	**288,913**	313,879	628,900	511,221	354,084

Source: Vienna Stock Exchange 1 Proposal to the Annual General Meeting 2 Double counting – as published by the Vienna Stock Exchange

FINANCIAL CALENDAR 2023

March 8, 2023	Results for the 2022 business year
March 19, 2023	Record date of Annual General Meeting
March 29, 2023	Annual General Meeting
March 31, 2023	Ex-dividend
April 3, 2023	Dividend record date
April 5, 2023	Dividend payment
April 27, 2023	Results for the first quarter of 2023
July 27, 2023	Results for the first half of 2023
November 2, 2023	Results for the first three quarters of 2023

The financial calendar with updates and information on the ANDRITZ share can be found on the Investor Relations page at the ANDRITZ web site andritz.com/share

SUSTAINABILITY AND COMPLIANCE

ANDRITZ considers sustainability and compliance to be the main cornerstones of responsible company management. Together with the company's core values – passion, partnership, perspectives and versatility – sustainability and compliance define what ANDRITZ stands for and form the basis of entrepreneurial activities, which are intended to satisfy the needs of all stakeholders in the best way possible.

SUSTAINABILITY (ESG)

Sustainability is an essential part of the ANDRITZ business strategy and company culture. All business decisions and measures follow the tenets and principles of sustainable development. The ANDRITZ sustainability program "We Care" comprises all existing activities, new measures, goals and plans in this sector. The group-wide ESG goals to which ANDRITZ has committed as part of "We Care" are based on three fundamental topics – digital transformation and innovation, stakeholder management, and corporate compliance. ANDRITZ strives to keep up with the latest developments here at all times in order to ensure best practices and highest standards. This is the basis on which the focus topics, defined as Environmental, Social and Governance, build – those areas in which ANDRITZ can make the largest contribution in the interests of a sustainable future. Ambitious ESG goals that contribute towards resource-saving and sustainable business operations at ANDRITZ as well as to achieving the sustainability goals of its stakeholders have been defined for each topic.

Environmental focus: The ANDRITZ goal is to minimize the impact of its own business activities on the environment. For example, the company's own CO_2 footprint (Scope 1+2) is to be halved by 2025, and water consumption and the amount of waste produced are to be reduced significantly. With its sustainable solutions and products, ANDRITZ also seeks to help its customers achieve their sustainability goals. The target is to increase the proportion of sustainable products and solutions to more than 50% of the Group's revenue by 2025 and thus contribute towards climate and environmental protection. →

Social focus: The goals in this sector focus on preventing accidents at work and making ANDRITZ an attractive employer. The former is reflected in the goal of reducing the frequency of accidents that result in lost working hours by 30% per year compared to the previous year and the latter in reducing the fluctuation rate and increasing the number of female employees.

Governance focus: ANDRITZ is concentrating its entrepreneurial activities on minimizing relevant corporate risks and continuously expanding its compliance activities, with special focus on sustainable supply chain management.

Details of the sustainability strategy are provided in the 2022 Annual Financial Report (“Non-financial statement”).

ANDRITZ holds the following certifications and commits to the following standards and initiatives:

ISO/IEC certifications:
ISO 14001:2015 – Environmental Management Systems
ISO 45001:2018 – Occupational Health and Safety Management Systems
ISO 9001:2015 – Quality Management Systems
ISO 50001:2018 – Energy Management Systems
ISO 37301:2021 – Compliance Management Systems
ISO 37001:2016 – Anti-bribery Management Systems
IEC 62443 – Security for industrial automation and control systems
ISO/IEC 27001:2013 – Information technology – Security techniques – Information security management systems

Furthermore, all products and processes are certified internally and externally (Machinery Directive, ASME, GB 150, ISO 3834, ANSI, EN, DIN and ISO norms). Hence, they meet the highest standards and are reviewed regularly for possible impacts on health, safety, and the environment.

Standards and initiatives:
Science Based Targets initiative (SBTi)
Global Reporting Initiative (GRI)
ILO International labor standards
Modern Slavery Act
OECD Guidelines for Multinational Enterprises
UN Global Compact Initiative

ANDRITZ is assessed by the following ESG rating agencies at regular intervals:
Carbon Disclosure Project (CDP)
EcoVadis
FTSE Russell
ISS ESG
MSCI
S&P Global
Sustainalytics

→

ESG TARGETS TO BE REACHED BY THE END OF 2025

ENVIRONMENT

50%

Reduction* in greenhouse gas emissions
(Scope 1+2)

–39%

Status end of 2022

10%

Reduction in water consumption*

–3%

Status end of 2022

50%

Share of revenue from sustainable solutions and products

45%

Status end of 2022

10%

Reduction in waste volume*

–35%

Status end of 2022

Details on the sustainability strategy are provided in the Consolidated Financial Statement 2022 (Non-financial statement).

* compared to the base year 2019

ESG TARGETS TO BE ACHIEVED BY THE END OF 2025
SOCIAL

30%

Reduction in the annual accident frequency rate
(> 1 day of absence)
compared to the
preceding year

–10%

vs. 2021
Status end of 2022

20%

Share of women in the workforce

16.4%

Status end of 2022

4.5%

Fluctuation rate as a result of voluntary resignations

6.0%

Status end of 2022

ESG TARGETS TO BE ACHIEVED BY THE END OF 2025
GOVERNANCE

85%

Procurement volume
covered by audited suppliers

82%

Status end of 2022

0

No infringements,
achieved by implementing the highest corporate compliance standards and monitoring observation of these standards

0

Status end of 2022

0

No event-driven profit warnings, achieved by detecting company risks at an early stage

0

Status end of 2022

COMPLIANCE

Compliance and ethical conduct, with integrity, respect, reliability and sustainability as their cornerstones, form the basis upon which ANDRITZ does business.

The ANDRITZ Code of Conduct and Ethics defines the internal company values, principles and rules, which go beyond the extensive legal provisions. It applies to all managers and members of staff as well as all external stakeholders working for ANDRITZ.

The group-wide Compliance Committee takes care of regular updates to the policies and monitors compliance with them. This committee is made up of employees from different group functions and focuses on such topics as corruption prevention, restraint of trade, anti-discrimination, insider trading, supplier compliance, export controls and data protection.

Regional compliance officers assist the committee and are available as contacts to advise members of staff on compliance matters at their own locations. To integrate the Compliance Management System even more effectively into the individual companies and locations, additional Compliance Directors have been nominated at the ANDRITZ subsidiaries.

In order to verify how effective the compliance management system is and achieve continuous improvements, ANDRITZ holds certification according to ISO 37301 for the compliance management system and to ISO 37001 for the anti-corruption management system. The regulations contain requirements for developing, implementing and maintaining a compliance management system as well as measures to help protect against, track down and provide proof of corruption.

ANDRITZ has implemented various measures – above all training on individual compliance topics – in order to create and strengthen a basic understanding of compliance. ■

PUBLISHER'S NOTE

PUBLISHED BY
ANDRITZ AG, 8045 Graz, Austria
andritz.com

RESPONSIBLE
Michael Buchbauer, ANDRITZ AG

EDITOR
ANDRITZ AG, Peter Gaide/ag-text

CONCEPT AND CREATIVE DESIGN
Strichpunkt GmbH, Stuttgart/Berlin, Germany
strichpunkt-design.de

Disclaimer
Certain statements contained in the ANDRITZ Annual Report 2022 and in the Annual Financial Report 2022 constitute "forward-looking statements". These statements, which contain the words "believe", "intend", "expect", and words of similar meaning, only reflect the Executive Board's beliefs and expectations and are subject to risks that may cause actual results to differ materially. As a result, readers are cautioned not to place undue reliance on such forward-looking statements. The company disclaims any obligation to publicly announce the result of any revisions to the forward-looking statements made herein, except where it would be required to do so under applicable law. The Annual Report 2022 and the Annual Financial Report 2022 contain assumptions and forecasts based on the information available up to the copy deadline on February 27, 2023. If the premises for these assumptions and forecasts do not materialize or risks indicated in the "Risk management" chapter and in the Management Report of the Annual Financial Report 2022 do arise, actual results may vary from the forecasts made in the Annual Report 2022 and the Annual Financial Report 2022. Although the greatest care was exercised in preparing data, all information relating to the future is provided without guarantee.

Note
In this report, ANDRITZ strives to use gender-sensitive language. If this is not possible in places, any personal terms used relate to all genders equally. The Annual Report 2022 is available in digital form only and is also published in German. In the event of any discrepancies, the German version shall prevail.

Annual Financial Report 2022
Detailed information on the 2022 business year, such as the integrated Management Report and Consolidated Financial Statements for 2022, can be found in the Annual Financial Report 2022, available for download at andritz.com/downloads.

Picture credits
P. 7: Riedler Peter; P. 10–16: Myrzik & Jarisch; picture of plant P. 11: ANDRITZ; Information graphic P. 13: STRICHPUNKT; P. 18: iStock by Getty Images; P. 19–20: Klabin S.A.; Information graphic P. 21: STRICHPUNKT; P. 22-23: ANDRITZ; P. 25: Myrzik & Jarisch; P. 26: iStock by Getty Images; P. 28: Myrzik & Jarisch; P. 29: ANDRITZ; P. 31 iStock by Getty Images; Illustration P. 32: STRICHPUNKT; P. 33: TNB Genco; P. 34: Kraftwerk Ryburg Schwörstadt AG; P. 36: ANDRITZ; P. 39: iStock by Getty Images; P. 40: Getty Images; P. 41: ANDRITZ; Information graphic; P. 42: STRICHPUNKT; P. 43: Alarmy; P 43: iStock by Getty Images.

ANDRITZ

ENGINEERED SUCCESS