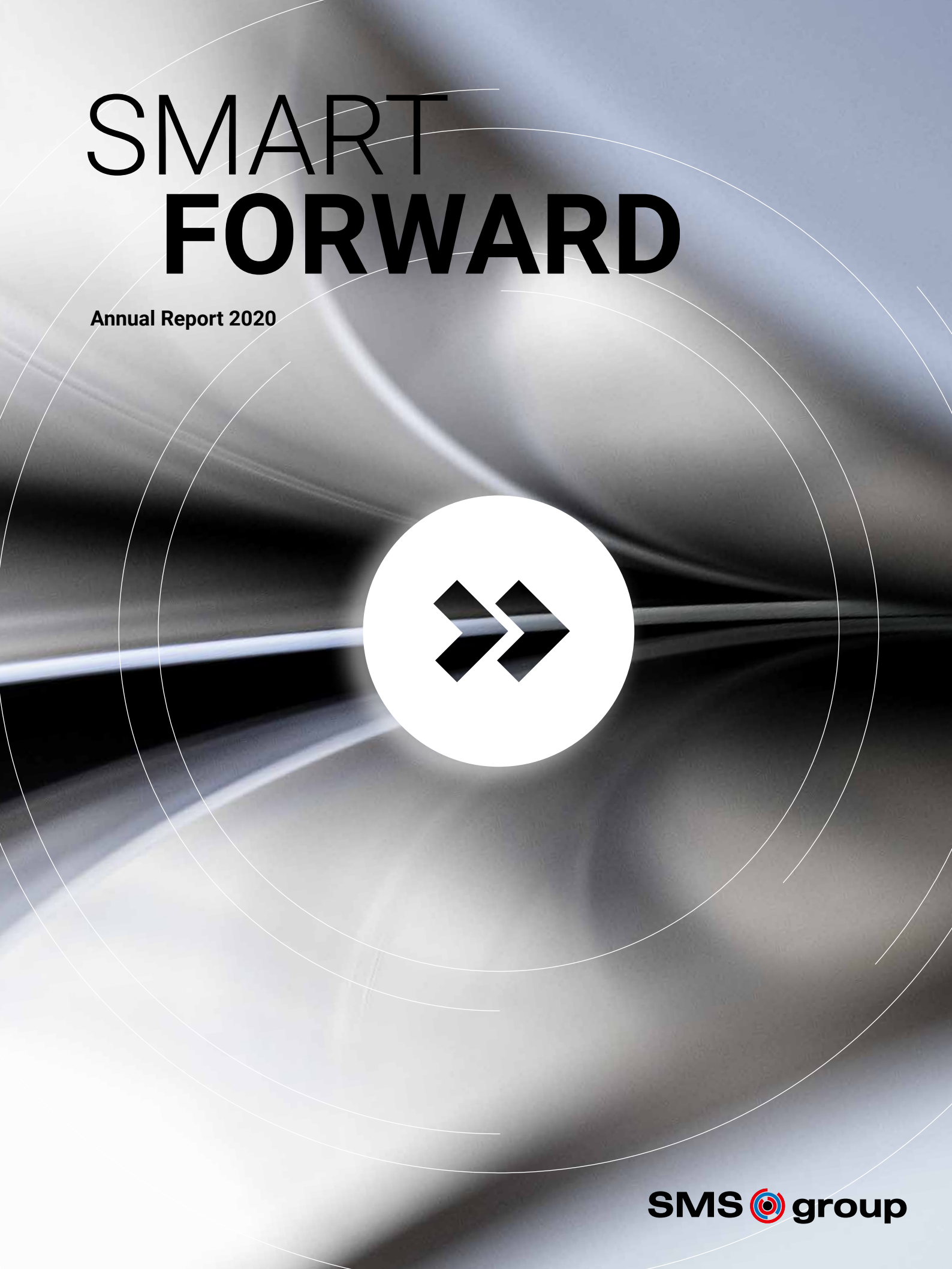
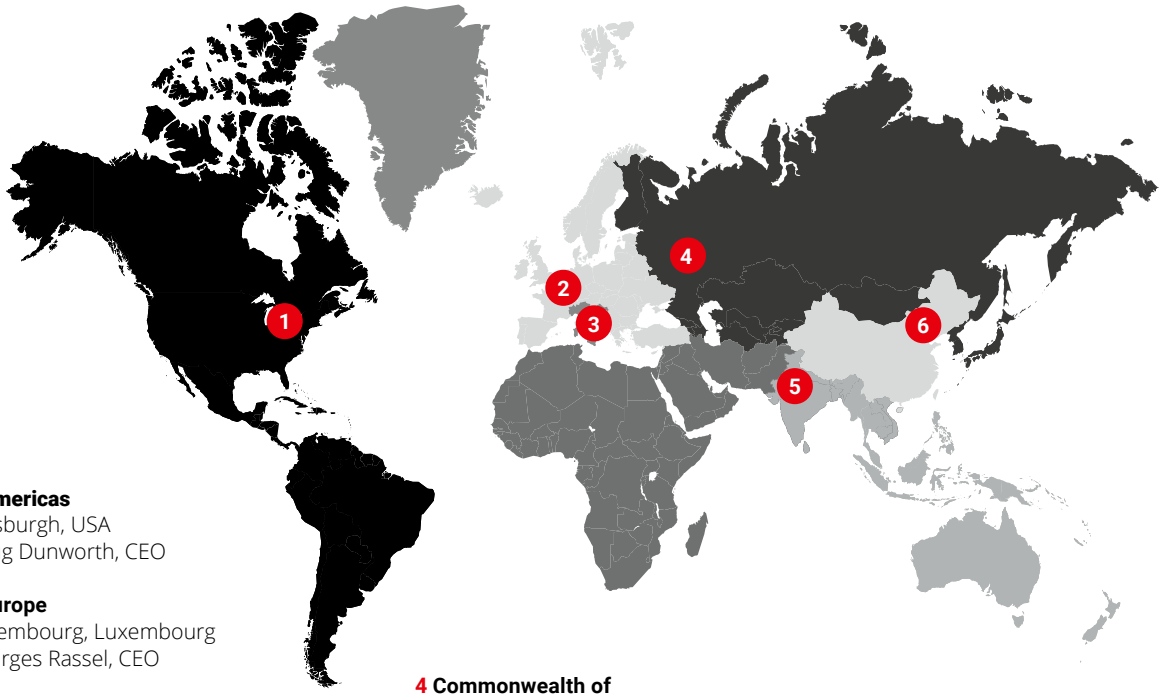
SMART FORWARD

Annual Report 2020



SMS group

SMS group
Close to the customer around the world



1 Americas
Pittsburgh, USA
Doug Dunworth, CEO

2 Europe
Luxembourg, Luxembourg
Georges Rassel, CEO

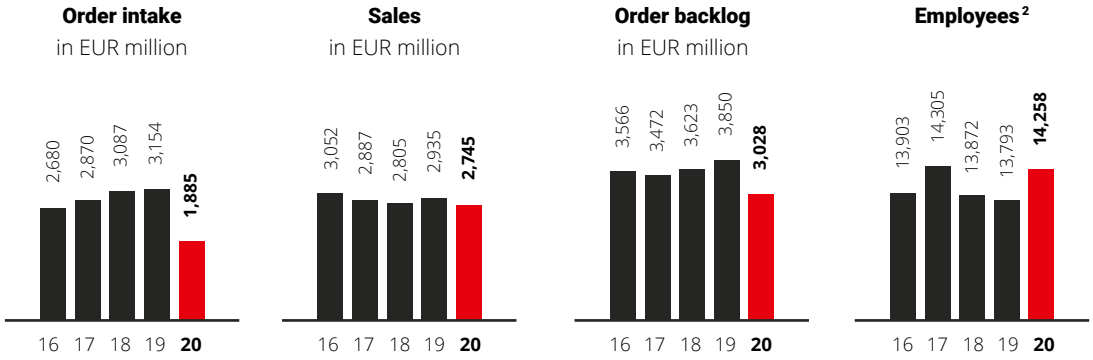
3 Italy/MEA
Tarcento, Italy
Marco Asquini, CEO

4 Commonwealth of Independent States
Moscow, Russia
Andre Schneider, CEO

5 India and Asia-Pacific
Gurgaon, India
Ulrich Greiner Pachter, CEO

6 China
Beijing, China
Yu Sun, CEO

SMS group figures[1]
2016–2020



Figures in accordance with International Financial Reporting Standards (IFRS)
[1]Including others/consolidated
[2]Average with apprentices/others

Annual Report
2020

Leading Partner in the World of Metals

SMS group is renowned worldwide for its mechanical and plant engineering expertise, its future-oriented technologies and its outstanding service for the metals industry. We use our 150 years of experience and our digital know-how to provide the industry continuously with innovative products and processes – even outside our core business. We are the partner for demanding projects, and we support our customers during the complete lifecyle of their plants, enabling profitable and resource-saving value creation chains. We have set ourselves the task of paving the way for a carbon-neutral and sustainable metals industry. As a global player with German roots, we take responsibility for our 14,000 employees and for wider society.

Executive Summary
Facts and Figures[1]

Covid-19
The entire global economy was impacted by the Covid-19 pandemic in 2020. In metallurgical machinery and plant engineering, Covid-19 has accelerated the structural changes in the market.

Our first priority was the protection of our employees. As early as February 2020, an internal crisis team was set up to evacuate staff working in Wuhan. By introducing a comprehensive package of measures throughout the company, we were able to avoid chains of infection and plant closures.

At the same time, we pursued the goal of minimizing the financial impact of the pandemic as far as possible. With this in mind, we have largely postponed replacement investments, introduced short-time working in accordance with the respective national regulations, reduced overtime, offered working from home solutions, and cut back on staff capacity at various locations.

Steel market
After the record high in 2018, the price level for steel products fell for the second year in succession. Global crude steel production in 2020 fell to 4.2% below the previous year's level. China, the largest single market, recorded growth of approximately 2.0% in 2020, but this only compensated to a limited extent for the major slumps in India (–13.2%), the USA (–18.7%), Europe (–18.1%) and many other regions. Due to the decline in production, the capacity utilization of steel producers deteriorated, which in turn had a negative impact on their investment activity.

Aluminum market
Global primary aluminum production was unaffected by the developments of the Covid-19 pandemic. At 65.3 million tonnes, it was up slightly on the previous year's level (63.7 million tonnes). Declining production trends in Europe (–1.6%) and the rest of Asia (–5.9%) were more than compensated for by an increase in production in North America (+4.4%) and China (+4.4%), which accounted for more than half of the total production volume.

Plant engineering
Against the backdrop of the ongoing Covid-19 crisis, steel producers and processors invested less in 2020. It is modernizations that are dominating the order books. At the same time, growing concern for the environment worldwide is driving forward the implementation of resource-saving and environmentally friendly methods and processes. System solutions for avoiding CO_2 emissions, boosting efficiency and reducing costs form the basis for new investments. Digitalization is another factor that can make our customers' production processes more cost-effective and environmentally friendly.

Trends in the metal industry
Structural change in the steel industry is progressing rapidly. While major investments in additional capacity and greenfield plants are becoming rarer, modernizations and services are growing in importance.

[1] As of: December 31, 2020

Burkhard Dahmen (left) and Torsten Heising

The metal industry is currently focused on the following issues in particular

— Green steelmaking and decarbonization of the steel industry
— Digitalization and automation
— 3D printing as a new manufacturing process
— Optimizing production capacity

These issues are also central to our own development work. In the 2020 financial year, we spent €89 million on general developments and on design enhancements to our products, which equates to 3.2% of our sales.

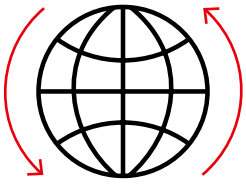
Sales

Sales of €2,745 million in the past financial year represented a drop of €190 million compared to the previous year (€2,935 million). We were unable to fully achieve our forecast of virtually unchanged sales, particularly as a result of the Covid-19 pandemic.

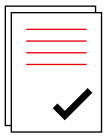
In the metallurgical plant engineering business, sales in the 2020 financial year were down year-on-year at €2,516 million (€2,669 million). Sales in the service business were also down, totaling €645 million (previous year: €713 million).

In the past financial year, our participation elexis reported sales of €179 million (previous year: €206 million), and our participation Elotherm reported sales of €56 million (previous year: €65 million).

Regional distribution of SMS group sales in 2020



Western Europe 27%
North America 26.9%
China 14.4%
Eastern Europe 11.3%
India 6.5%
Rest of Asia 5.9%
MENA 4.4%
Latin America 3.1%
Africa 0.5%



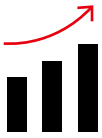
–€165 M EBT

Result

The 2020 result was impacted by the Covid-19 pandemic and the provisions for the restructuring in Germany. As a result, SMS group closed with a distinct loss: earnings before taxes on income (EBT) totaled –€165 million (previous year: €64 million). We were unable to confirm our forecast of virtually unchanged earnings before taxes at the level we experienced the previous year.

Liquidity

Securing liquidity remains a top priority. We achieved significant improvements in working capital, particularly in trade accounts receivable. Cash flow from operating activities increased from €68 million in the previous year to €106 million.

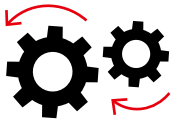


€106 M
Cashflow

Although our Group is largely self-financed, we have established a credit line as a precautionary measure in response to the Covid-19 situation. Independently of this, cash and cash equivalents increased by €46 million year-on-year to €742 million (previous year: €695 million). The advance payments received, which are customary in the industry, are secured by bank guarantees. The proportion of guarantee and credit lines used is around 37%.

Orders

In the past financial year, orders received fell to €1,885 million (previous year €3,154 million) as a result of Covid-19, a decrease of €1,269 million. Since this figure is lower than our sales, the orders on our books decreased to €3,028 million at the end of the year. In terms of order development, the growth area of Technical Service proved more robust than the other areas of business and investments. The service share of total order volume increased to 35% (previous year: 23.5%). We are expanding our range of services in order to achieve continued growth in the robust service business. Our technical expertise also gives us a competitive advantage over pure software providers in the digitalization of industrial plant, which is indispensable for many services in this sector. At the same time, we are increasingly agreeing performance-based contracts with customers. In this business model, our results-based payment reflects the value of the additional performance achieved by the customer.



€1,885 M
Orders received

Investments

In order to contain the negative impacts of the Covid-19 pandemic, we made the decision to reduce replacement investments during the past financial year. At the same time, we took advantage of opportunities for strategic acquisitions and shareholdings. This meant that the cash outflow from investment activity increased to €83 million. The volume of investment in tangible and intangible assets amounted to €58 million

€83 M
Investment activity

(previous year: €39 million). This increase is related to the construction of the new campus at the Mönchengladbach site and the new corporate headquarters of group company BST Eltromat International GmbH. Additionally, we have invested in extra network and server capacities and also IT equipment to provide for working from home.

We invested €32 million in other participations and securities held as long-term investments (previous year: €23 million). This compares with proceeds from the disposal of financial assets amounting to €28 million (previous year: €17 million).

Acquisitions

We also use targeted acquisitions to strengthen our position in mechanical and plant engineering. For example, we have expanded our product range in extrusion lines and forging presses by acquiring the Italian company Hydromec S.r.l. as well as increasing our shareholding in OMAV S.p.A., Italy. Both companies are able to market their product portfolios through SMS group's global network.

Market position strengthened by inorganic **growth**

By acquiring the Brazilian company Vetta Tecnologia S. A., we have expanded our digitalization business to include energy and sustainability. This sector is vital for the entire steel and metals industry, as it has a significant impact on profitability and is an important lever for reducing the industry's carbon footprint.

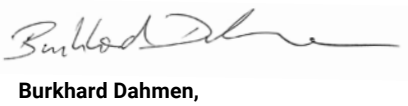
We also increased our shareholding in Esmech Equipment Private Limited, India.

Employees

Avg. **14,258**
employees

On average, SMS group had a workforce of 14,258 in the 2020 financial year (previous year: 13,793). This moderate increase is mainly due to the acquisition of Vetta Tecnologia S. A. and the targeted acquisitions in the forging sector.

At elexis and Elotherm, the number of employees decreased slightly to 1,530 (previous year: 1,563).



Burkhard Dahmen,
Chairman, SMS GmbH

Torsten Heising,
Director, SMS GmbH

Interview with the Management Board

Michael Rzepczyk
COO

Burkhard Dahmen
CEO

Prof. Dr.-Ing. Katja Windt
CDO

Prof. Dr. Hans Ferkel
CTO

Torsten Heising
CFO

Burkhard Dahmen

Mr Dahmen, how did the 2020 financial year go for SMS group?

BURKHARD DAHMEN The past year was marked by the impacts of the pandemic and presented us with entirely new challenges as a global plant constructor. Nevertheless, we successfully rose to these challenges all over the world. The strong teamwork that forms part of our company's culture was one of the crucial factors in this regard. I am very grateful to the employees of the entire group for their unwavering commitment. This experience has also taught us that we can grow from crises.

We have learned to make the most of the digital and multimedia tools at our disposal, both in our daily work and during commissioning.

Mr Heising, how is the exceptional nature of this year reflected in the figures?

TORSTEN HEISING Due to the Covid crisis, there was a sharp drop in order intake, as could be expected. Sales were also down on the previous year's level. As a result of the pandemic, we closed with a clear loss. By systematically applying targeted measures, we were able to limit the impact of the Covid crisis. Our liquidity position remains solid and we generated a positive cash flow, even in this difficult year. We have continued to invest in growth and quality, for example in our digitalization business and the expansion of our product portfolio.

Mr Rzepczyk, you have global responsibility for project implementation. How do you assess the past year under Covid-19?

MICHAEL RZEPCZYK We witnessed a very strong bond between all our group employees in the respective regions. They stepped in to support each other when certain projects became short-staffed. This is how we successfully completed many projects in spite of the Covid pandemic. In my eyes, this demonstrates our success in putting SMS group on a stable operational footing that will also carry us through a difficult year. Digital tools have proven especially valuable to us in this regard.

» We are focusing on new growth areas: innovations, targeted acquisitions, new markets and business segments and the expansion of the high-margin service business. «

Burkhard Dahmen,
CEO

By systematically applying targeted measures, we were able to limit the impact of the Covid crisis. In spite of the difficult circumstances, we have invested in growth, for example in our digitalization business and the expansion of our product portfolio.

Torsten Heising,
CFO

Could you tell us more about that?

MICHAEL RZEPCZYK We have been working with solutions such as the digital twin and virtual commissioning for years. Last year the benefits really came to the fore. At Metior in the USA, for example, we exploited the possibilities of augmented reality (AR) for a plant commissioning. This was necessary because the new drive design required supervision and advice from a team of technical experts from Germany. However, it was not possible for them to travel to the USA. Instead, we deployed a local service team from Pittsburgh and equipped them with AR glasses. This enabled the German team to follow the work being performed on site in real time and provide their support wherever necessary.

Torsten Heising

What developments particularly defined the past financial year for you, Mr Ferkel?

HANS FERKEL There were so many. Together with EMG Automation GmbH, we developed the X-Roll® Guide FM system to improve strip guide control in hot strip mills. The associated X-Pact® Sense camera system determines the center position of the strip between the stands with a high degree of accuracy and a fast scanning rate, providing an input signal for automatic leveling control. This greatly reduces the chances of the strip end being damaged during threading, which can lead to roll marks and damage to the strip surface.

ExtruForm stands for a combined casting, rolling and extrusion process that produces electric wire rod and welding wire. By combining several successive stages in the process chain, the ExtruForm line enables a far shorter production cycle than the conventional method of producing wire rod. This significantly reduces operating costs.

Another development project I would like to mention is the new process for recycling lithium-ion batteries. Primobius is a joint venture that we founded with the Australian company Neometals. Primobius has developed hydrometallurgical technologies for recycling lithium-ion batteries in order to recover valuable raw materials in an environmentally friendly manner and return them to the material cycle.

Katja Windt

Mr Dahmen, are you going to continue SMS group's current strategy?

BURKHARD DAHMEN Yes, since our core business will continue to operate below capacity after Covid, our strategy remains the right one. We are consistently focusing on new growth areas: innovations, targeted acquisitions, new markets and business segments and the expansion of the service business. We will continue to build on our commitment as Leading Partner for our customers with product and process innovations.

What will change as a result of the strong expansion of the service business, Ms Windt?

KATJA WINDT We are increasingly becoming a systems provider and supporting our clients along the entire value creation chain with integrated service solutions, including electrics and automation and digitalization. In this way, we help our customers to boost their operational performance. After all, we are able to offer these integrated services and plant technologies from a single source. Our offering ranges from classic engineering to outsourcing solutions and new business models.

Is this in line with market requirements?

KATJA WINDT Our customers are investing in optimization, service and digitalization as well as new automation solutions for their plants. Our new business models such as Software as a Service and Equipment as a Service are being well received on the market. For example, one customer has commissioned us to supply a powder atomization system for producing high-quality metal powders. Here we are applying an Equipment-as-a-Service model for the first time: we retain ownership of the plant and are paid by the customer based on the volume of stainless steel powder produced.

» We are increasingly becoming a systems provider and supporting our clients along the entire value creation chain with integrated service solutions, including electrics and automation and digitalization, in order to boost their performance indicators. «

Katja Windt,
CDO

Hans Ferkel

Mr Heising, SMS group has undergone a global realignment. Can you briefly explain the new organization to us?

TORSTEN HEISING Our project business thrives on direct, local contact with our customers. We have built on this and adapted our internal structure. Our new organization places the project, and therefore the customer, center stage. We have shifted responsibility for results to the region of our customers, where the projects are initiated and executed. This enables us to act quickly and purposefully in the market and respond better to various regional challenges – such as changes in environmental policy, market conditions or resource availability. We have also set up global Centers of Excellence (CoEs), which are responsible in particular for product development. The CoEs have consistent, global responsibility for their products, irrespective of the companies involved. In the future, the CoEs will only be responsible for handling smaller projects.

Steel production needs to become greener. Mr Ferkel, what measures has SMS group taken to meet these challenges?

HANS FERKEL In collaboration with our company Paul Wurth, we have developed a roadmap and a toolkit for decarbonizing the metals industry. They enable our customers to implement the CO_2 reduction measures that are best suited to their operations. Green Steel is the keyword here. We see it as our responsibility as an enabler to support our customers in the transition to sustainable, climate-neutral materials production. We have already paved the way for this transition in the past. But we are far from reaching the end of the road. One important step is our acquisition of the company Paul Wurth in its entirety. This further strengthens our capabilities as a plant constructor in metallurgy and hydrogen technology.

How will this acquisition affect the organization of SMS group?

HANS FERKEL We will develop the location in Luxembourg into a group-wide research and development center for decarbonization and the application of hydrogen technologies. To this end, we will bundle the research and development activities of SMS and

» We see it as our responsibility as an enabler to support our customers in the transition to sustainable, climate-neutral materials production. «

Hans Ferkel,
CTO

Paul Wurth in these fields. The future range of services will include all technologies for reducing CO_2 emissions in existing steel mills; hydrogen-based, CO_2-free direct reduction of iron ore; and Power-To-X technologies for producing synthetic fuels and downstream products.

BURKHARD DAHMEN With our broad range of decarbonization technologies, we can support our customers in every phase of the transformation. This applies both to existing plants and to investments in bridging technologies on the road to climate-neutral steel production.

Last year, SMS received an award from the State of North Rhine-Westphalia for its commitment to transition. What does this award mean for SMS group, Mr Heising?

TORSTEN HEISING Awards like this demonstrate that we are perceived as a forward-looking company. After all, the awards were presented to organizations that are driving North Rhine-Westphalia's structural transformation into a strong, future-facing location for business. Of course we are proud to be recognized as one of eleven outstanding companies. We intend to maintain this commitment to continuous change and improvement, in particular by strengthening our capacity for innovation. That's also why we chose "smart forward" as the motto for this year's annual report: it's about growing through smart and sustainable decisions to ensure stable, future-proof development.

Michael Rzepczyk

» We have successfully put SMS group on a stable operational footing that will also carry us through a difficult year. «

Michael Rzepczyk,
COO

In Mönchengladbach, the foundation stone has just been laid for the new Campus. What motivated SMS group to build this new premises?

TORSTEN HEISING With the SMS group Campus, we are creating a new central location on the Rhine. The modern building complex will be the base for our employees in the Rhineland. With the Campus, we are reducing the operating costs of currently five locations in the region while also establishing a platform for creativity, exchange and mutual inspiration. This promotes flexible project and team work, including with international colleagues.

KATJA WINDT As well as uniting the relevant technologies and interfaces for our areas of future growth, we are bringing together those experts who will always think one step ahead, and they will give the Campus its shared identity. It is precisely these mutually supportive teams that will make our technology, service and digitalization hub unique and successful. We will therefore install the latest digital infrastructure and efficient digital processes at our new headquarters.

Edwin Eichler,
Chairman of the Supervisory Board, SMS group GmbH

Dear business partners,

For more than a year now, we as a company and all our employees have been successfully battling the pandemic and its impacts. Our business operations continue to be severely restricted, and the effects of last year's sharp market contraction will continue to be felt in the years to come.

That is why I am especially grateful not only to all our employees, but also to the families who have lived with the considerable strain of home office, countless restrictions in their daily lives, and perhaps even direct exposure to the virus. We all have a powerful, collective experience of what it means to stand together, to be fully engaged and to seek unconventional solutions in a spirit of cooperation.

Under these circumstances, SMS group has fought bravely. Admittedly, the shortfall in order intake and the necessary adjustment to the new environment have placed a heavy financial burden on us. Nevertheless, our earnings situation has developed better than we expected in mid-2020, thanks to our rigorous management of liquidity and costs. This is clearly reflected in our positive cash flow and lower than expected provisions.

While these developments were taking place on the operational side, the management took this phase as an opportunity to reorganize the entire structure and processes of SMS group.

The regional structure that has now been introduced brings our products even closer to the market by placing a clear focus on our customers and their needs. In addition, transferring responsibility for results to the projects enables each unit to concentrate on its core competencies. The most crucial requirement to make our realignment a success is an open, cooperative corporate culture that intelligently combines a range of competencies for the benefit of our customers' projects.

On this basis, we will continue to develop the strategic activities of our group with clear purpose. Our service business shall carry the greatest responsibility for sustainable and profitable growth. Alongside technological developments in plant construction and mechanical engineering, enhanced by the latest digital capabilities, we are increasingly offering integrated solutions that enable our customers to boost their operating profitability.

The market appears to have bottomed out around the start of 2021. Having strengthened our liquidity, we have ensured our ongoing independence. The majority of the extensive restructuring measures we have defined will be in place by the end of this year. By acquiring all shares in the operating business of Paul Wurth in Luxembourg and making other targeted acquisitions, we have further expanded our technological expertise.

Most fundamentally of all, it is our global positioning and the outstanding expertise of our employees that will enable us to turn this crisis into an opportunity. We are all looking forward to the time when we can leave the pandemic behind us. Nevertheless, besides causing us significant stress and strain, this period has also taught us that we can move forward with new, creative solutions by making smart use of digital tools and adopting a pragmatic, entrepreneurial approach.

The groundbreaking ceremony for our future headquarters in Mönchengladbach is not the only sign that we are entering a new chapter in our 150-year company history. Personally, I see the determined efforts of every individual and the search for new avenues to success as the greatest proof that our SMS group has what it takes to expand its position as a leading solutions provider for the materials industry.

Yours,

Edwin Eichler,
Chairman of the Supervisory Board, SMS group GmbH

Heinrich Weiss,
Chairman of the Shareholders' Committee

Dear partners and friends of our company,

The market has seen a recovery since the beginning of this year. Most of our customers enjoy a strong economic position and have started to make investments postponed during the past years of crisis and due to the Covid-19 pandemic.

In order to be even closer to the markets, we have given ourselves a new organizational structure. By decentralizing our sales activities on the different continents, we can now even further enhance the support of our customers and learn about new projects very early on. This applies in particular to the Chinese market, where we want to be – also for political reasons – a "Chinese company" for China.

Nevertheless, the technological expertise of our development and engineering departments – in connection with our workshops in Germany – will continue to be the key to our success.

The far-reaching intervention by politics and regulatory bodies in our country has impacted the competitiveness of the German economy for more than a decade. Excessive bureaucracy has been an additional constraint on our entrepreneurial activities.

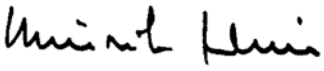
And, while urgent future-relevant tasks have not been tackled, money has been spent lavishly in the social sector. In numerous areas – digitalization, for example, or corporate taxes – we are now one of the last in the queue in the EU. The necessity of disciplined budgeting seems to be forgotten everywhere in the EU. This means we are living at the cost of the future and future generations.

In this context of virtually irresponsible economic and financial political decision-making, the family-owned companies in Germany keep up a solid position and continue their strong commitment to the well-being of all demographic groups through entrepreneurial success and the creation of future-oriented jobs.

Therefore, we are determined to continue making our contribution to the economic development of Germany in the future, even though this may to an increasing degree necessitate the relocation of unprofitable activities to lower-cost countries.

Also this year, I would like to thank you in the name of our employees, the Management and my family for your trust in our company. We will continue to spare no effort to be – for you – the best company in our industry.

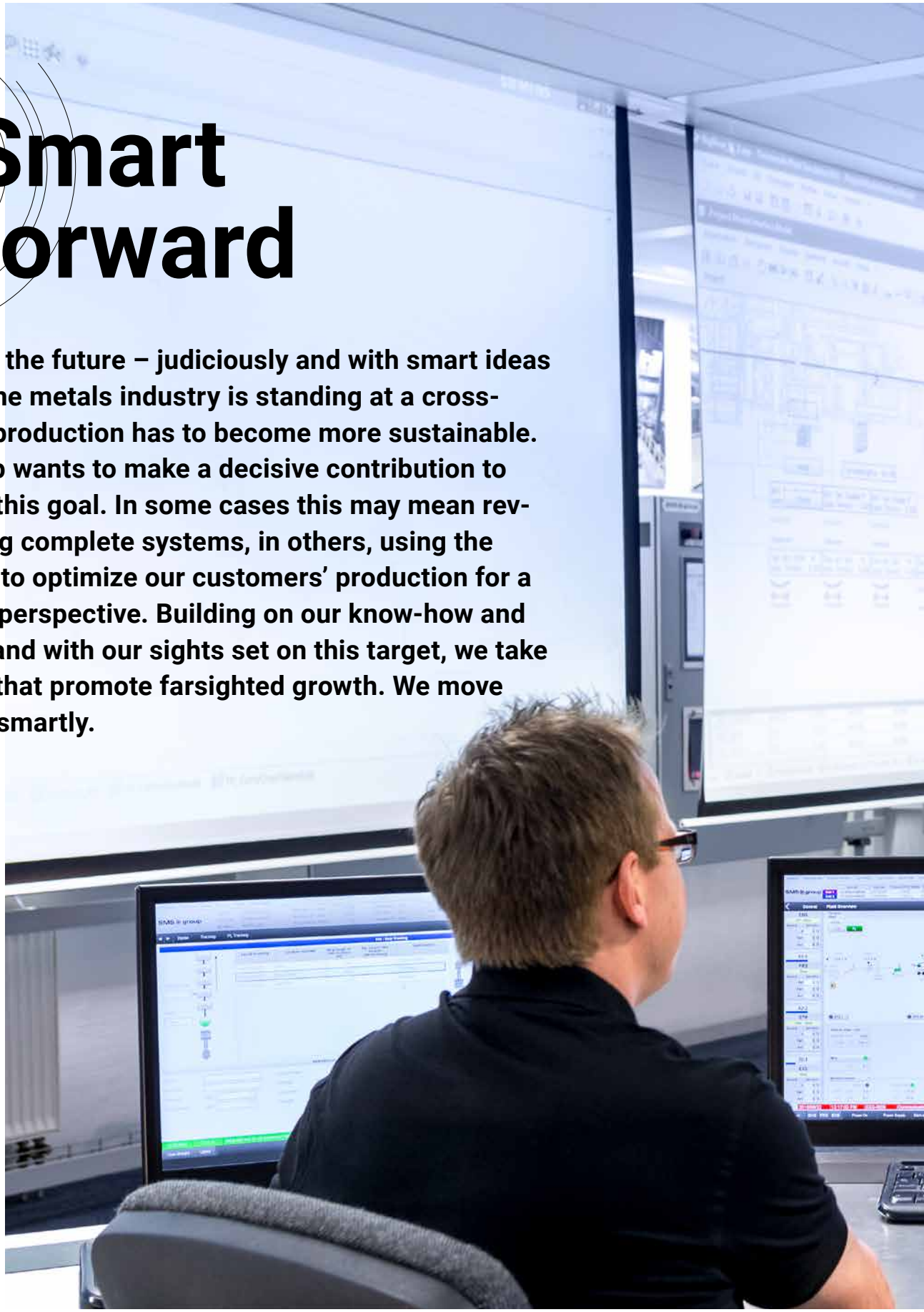
Thank you very much for your trust.



Heinrich Weiss,
Chairman of the Shareholders' Committee

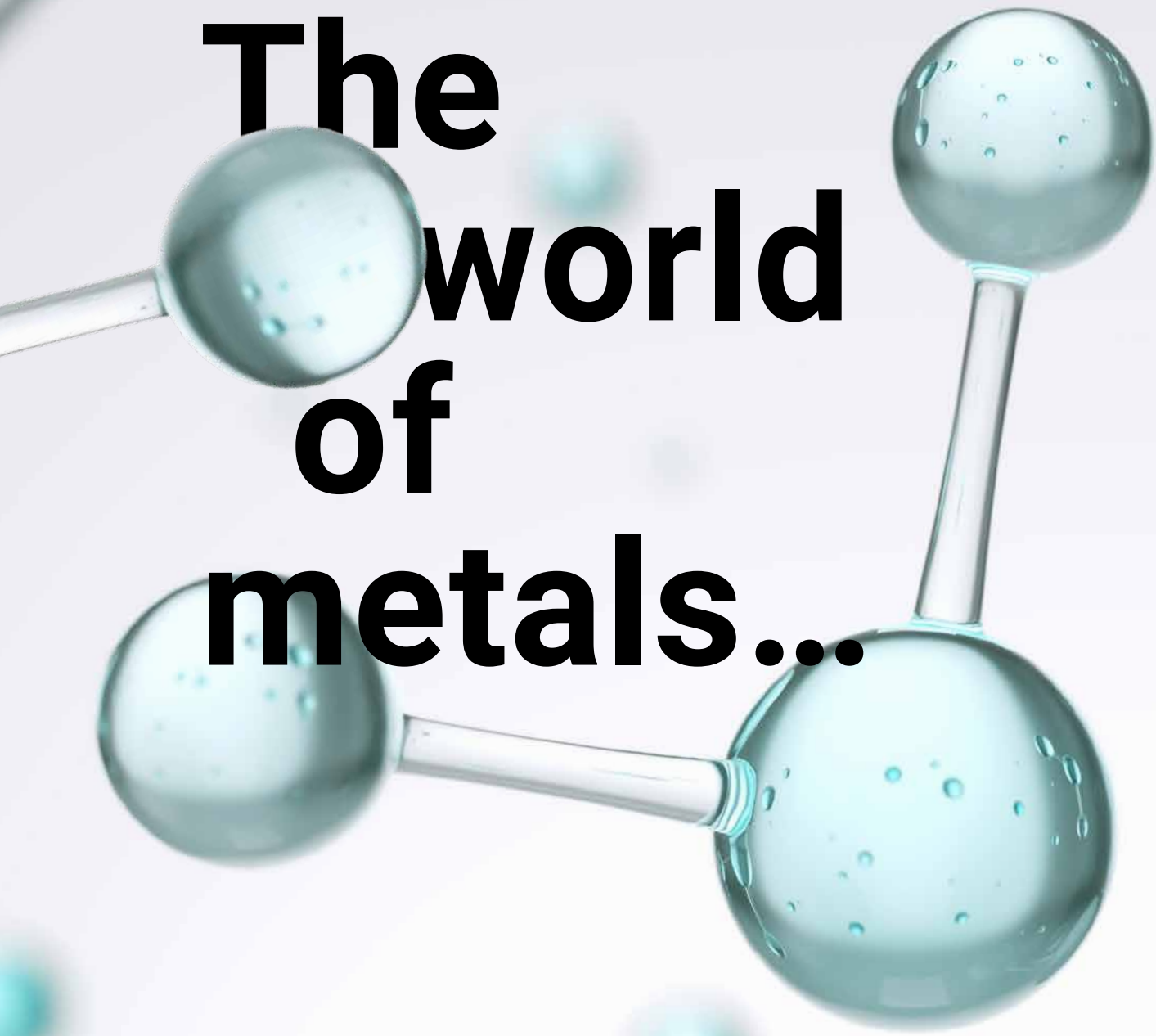
» Smart forward

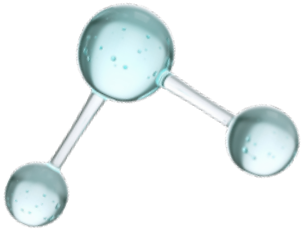
We look to the future – judiciously and with smart ideas in mind. The metals industry is standing at a cross-roads: Its production has to become more sustainable. SMS group wants to make a decisive contribution to achieving this goal. In some cases this may mean rev-olutionizing complete systems, in others, using the right lever to optimize our customers' production for a long-term perspective. Building on our know-how and expertise and with our sights set on this target, we take decisions that promote farsighted growth. We move forward – smartly.




SMS group

The world of metals…





...is becoming greener

The metals industry is standing at a crossroads: Its products are indispensable for all modern societies – today and in the future. But its current production processes are no longer future-viable because their CO_2 footprint is too big. Almost ten percent of global greenhouse gas emissions stem from the production and processing of steel, aluminium, copper and other non-ferrous metals. The good news: The roadmap towards climate neutrality in the metals sector is taking clear shape.

In existing integrated iron and steelworks our technologies can achieve significant reductions of CO_2 emissions.

The roadmap to climate-friendly production

The technological potential for a carbon-neutral and sustainable metals industry is enormous. We are committed to preparing the ground for this transition for our customers and to actively advancing the transformation in the metals industry. This applies not only to production, but also to recycling, as the re-use of metals plays a key role in the vision of a sustainable circular economy.

The blast furnace in focus

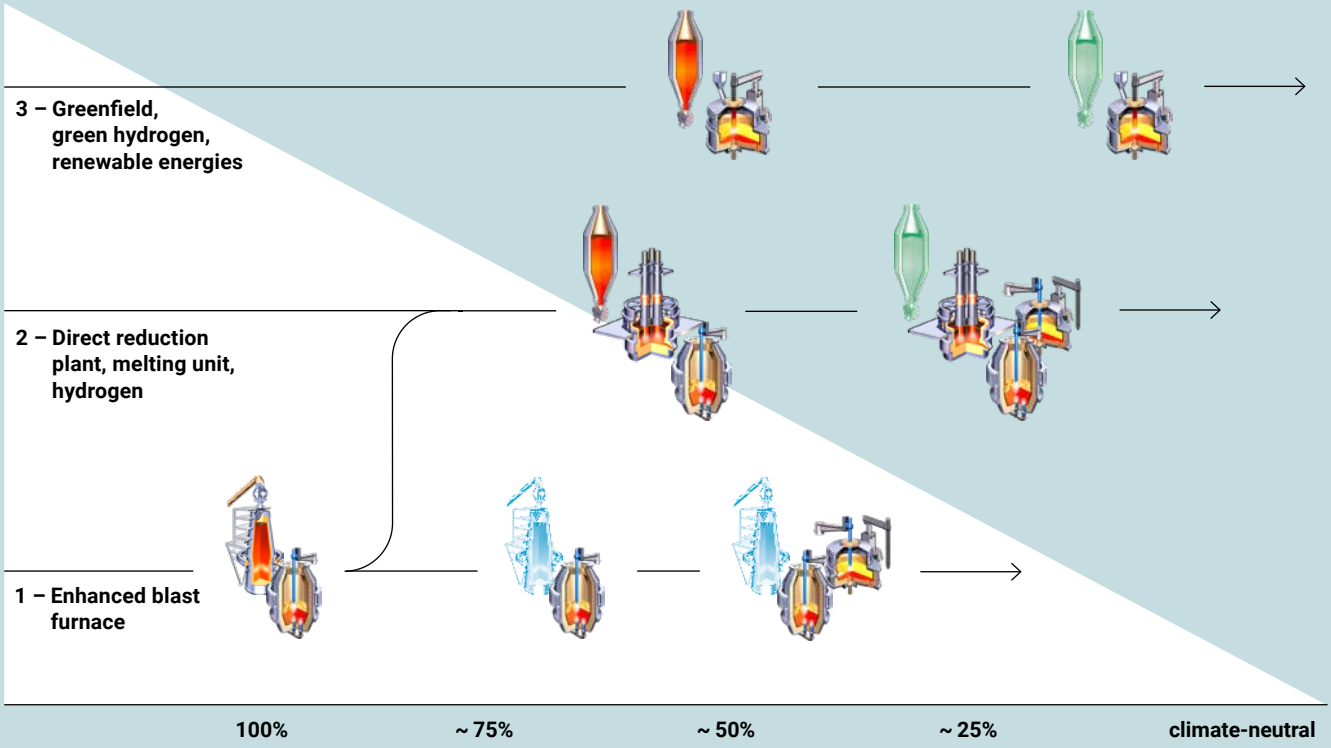
In order to promote the decarbonization of the steel industry, it is essential to focus on the primary stage of iron making, as this stage accounts for more than 80 percent of the greenhouse gas emissions. In new facilities, the key to reducing greenhouse gas emissions to zero is the combination of green hydrogen, direct reduction and the electrification of all downstream processes. In existing integrated steelworks, we substitute carbon-containing fuels to an increasing extent by converting and modifying existing plant facilities and infrastructures step by step. This approach relies on the in-depth analysis of all energy balances and flows of material throughout the works.

In order to support our customers on their path towards decarbonization even more efficiently, we recently acquired all shares of Luxembourg-based Paul Wurth, which has been part of SMS group since 2012. In April 2021, we acquired the remaining shares from the Luxembourg state and state-owned banking organizations. Jointly, we will focus on metallurgical challenges and on advancing hydrogen technologies. In addition, we boast expertise in direct reduction plants, environmental protection solutions and recycling technologies, and will place special emphasis on the development and implementation of technologies promoting CO_2-neutral steel production. Paul Wurth – like SMS group – looks back on 150 years of experience.

Our future offering will include, in addition to a CO_2-free direct reduction process for iron ore, a series of other technologies for the reduction of CO_2 emissions in existing steel mills. We will also offer Power-To-X technologies for the production of synthetic fuels and downstream products.

We will pool our group-wide research and development activities for decarbonization and recycling at the Luxembourg site. Additionally, a strategic partnership has been agreed with the University of Luxembourg, where – with financial support from Paul Wurth – a chair for energy process technology has already been established.

We offer the full range of decarbonization technologies



1 – Blast furnace / BOF converter

The integrated blast furnace-BOF route uses large amounts of iron ore – in many cases, ore with only low iron content. In this route, limited quantities of scrap (about 20 percent) can be added during the BOF process. Due to the massive use of coke for iron ore reduction, the BF-BOF route is the steelmaking route with the highest CO_2 emissions.

Technology from Paul Wurth provides a substantial enhancement of the blast furnace and the cokemaking processes, reducing the coke rate and the CO_2 emissions as a result. In order to maximize the scrap rate, electric arc furnaces or, for example, the SMS CONPRO technology can be used in the steelworks. This approach is only limited by the fact that quality requirements may rule out the use of scrap due to the potential risk of contaminations in the scrap.

2 – Direct reduction / melting unit / BOF converter

The blast furnace is substituted by a combination of the MIDREX® direct reduction process and a melting unit. It is possible to initially run the direct reduction process on a natural-gas basis, then use hydrogen in place of natural gas at gradually higher rates. Also in this process configuration, electric arc furnaces can be used in the steelworks to increase the scrap rate.

The main feedstock in this process route continues to be iron ore pellets – also in this case, of rather low iron content.

Before it can be refined in the BOF converter, the molten pig iron has to be carburized. To this purpose, CO-containing waste gas from the converter process can be recirculated into the MIDREX® direct reduction process (carbon cycle).

Like the slag from the blast furnace, the slag arising in the melting unit is a valuable, emission-reducing raw material for the construction material industry (cement).

3 – Direct reduction / electric arc furnace

In a greenfield approach and with green hydrogen available at competitive prices in sufficient quantities, a completely different route can be adopted.

The reduced higher-grade iron ore can be melted directly in an electric arc furnace and refined into steel. No intermediate step is required and – depending on the specified final grade – only minor carburization is needed. From the very beginning, scrap can be added to the furnace at higher rates, with only the quality requirements of downstream processing stages setting an upper limit here. This set-up provides the highest decarbonization potential.

» We have been concentrating on developing solutions that optimize production and reduce emissions at the same time. Due to the increasingly stringent environmental and climate protection regulations, we have been experiencing high demand for products in our current portfolio. «

Thomas Hansmann,
Executive Vice President, SMS group

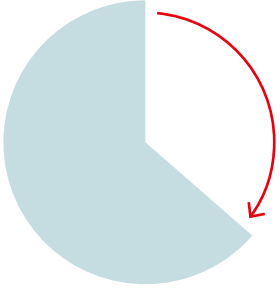
Extremely efficient:
The Sunfire Hylink module uses waste heat from industrial facilities to produce hydrogen.

Hydrogen as a green product

In order to be able to use hydrogen profitably in the steel industry, it must be available in sufficient quantity. Currently, there are still not sufficient production capacities.

Since 2019, we have been a strategic investor in and technology partner of Sunfire. The German company has developed an efficient high-temperature electrolysis process. The difference between high-temperature and conventional electrolysis is that steam is used instead of liquid water. Steam provides the advantage that it can be more easily separated into hydrogen and oxygen. Since the steam can be generated using waste heat from industrial facilities, this process is suitable for every steelworks. Not only can 20 to 30 percent of energy be saved compared to conventional electrolysis, this process is also significantly more efficient.

To be commissioned in 2023: The first production facility for renewable fuels with a production capacity of 10 million liters is being constructed in Herøya, Norway.



20 to 30%

energy savings compared to conventional electrolysis

The hydrogen produced on site can be directly used in the blast furnace and the steelworks – or for other purposes. The Sunfire technology will, for example, be used in a lighthouse project in Norway: At Norsk e-Fuel, CO_2 is going to be converted into renewable fuels using wind- and hydropower. The MULTIPLHY project in Rotterdam involves the construction and operation of a multi-megawatt high-temperature electrolyzer. The 960 tons of green hydrogen expected to be produced by the end of 2024 will avoid approximately 8,000 tons of greenhouse gases.

Battery recycling 2.0

Electric vehicles, smartphones, robot lawn mowers – the worldwide demand for rechargeable batteries is growing continuously. But the resources needed are scarce and subject to controversy. Our joint venture Primobius provides smart recycling solutions that help meet this growing demand in an environmentally friendly way.

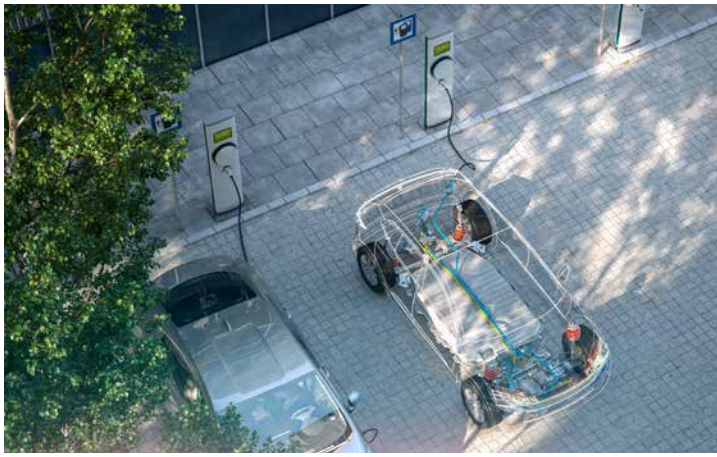
Our target is to offer a recycling solution – in the short term – that is both efficient and highly scalable. The market needs viable recycling options that enable the recovery of valuable materials from batteries. We provide the necessary technology and equipment – and the operating and logistics concepts.

Horst Krenn,
Managing Director of Primobius GmbH

Growing demand for recycling in Europe

In the automotive industry, the course is set for e-mobility. In the transition to electric mobility one component has been and will be playing a crucial role: the battery. It is the battery's capacity that determines to a large extent whether we will be able to drive only to the next supermarket or whether our electric car will reliably take us all the way to our holiday destination. While hardly any potential car buyer takes notice of the fuel tank in a combustion vehicle, the battery has become the key criterion for consumers to decide against or in favor of an electric vehicle. Apart from being an important performance driver of EVs, batteries also drive up their sales price. Up to 40 percent of the value added in EV production is accounted for by the battery cell! Thanks to their high energy density, lithium-ion batteries have become the preferred choice in e-mobility.

Besides the automotive industry, other sectors rely on the storage of electrical energy in lithium-ion batteries. These batteries are also used in electric devices and solar panel systems, for example. Europe is about to become a global leader as a producer of lithium-ion batteries. Therefore, we have been observing a soaring demand for the raw materials needed for their production, and this trend is set to continue. Yet, in particular, lithium and cobalt are conflictual materials. There are social, ethical and environmental concerns about the conditions under which these raw materials are mined.



Smart and energy-efficient recycling improves the CO_2 balance of lithium-ion batteries.

Therefore, more and more companies worldwide are making commitments to greater sustainability – and to more responsible raw material sourcing. Meanwhile, producers of electric vehicles and electronic devices are even legally obliged to take their products back and recycle the end-of-life lithium-ion batteries the products contain. The producers can perform the recycling either themselves or entrust specialists with the task of recovering the valuable materials. Battery recycling also brings a further benefit: It achieves a much better energy balance than battery production based on ores. This means that battery recycling plays a key role in further improving the CO_2 balance of electric vehicles and electronic devices.

The demonstration plant in Hilchenbach: In step 1, the batteries are comminuted and sorted (shown in the foreground). In the second step, lithium, nickel, cobalt and other valuable materials are recovered.

Sustainable in multiple ways

In summer 2020, we founded the joint venture Primobius GmbH – with Australian project developer Neometals Ltd. – with the objective to develop an environmentally friendly recycling process for lithium-ion batteries. This advanced technology enables us to recover valuable materials from vehicle batteries and rechargeable batteries in electronic devices in an exceptionally sustainable way for reuse in the production cycle. The Primobius recycling solution is based on a two-stage process. In the first stage of the process, batteries of different sizes and types are comminuted and separated into plastic and metal fractions, producing what is called the black mass, which contains the key ingredients for the production of modern batteries. During the second step – the hydrometallurgical process – lithium, nickel, cobalt and other elements are extracted from the black mass. More than 90 percent of the alloying elements can be recovered as ultra-clean materials in this way, and reused in cathode and battery cell production – closing the last gap of a value-added battery production cycle.

Primobius has successfully advanced this technique within a very short time to industrial scale. The two-stage process provides an important advantage: While the mechanical communition of the bulky material can be performed in smaller facilities near the collection points, the processing of the black mass can be centralized in dedicated facilities. This saves on transportation costs, avoids CO_2 and reduces the risks of fire and of leaking hazardous substances associated with larger accumulations of lithium-ion batteries.

A win-win situation

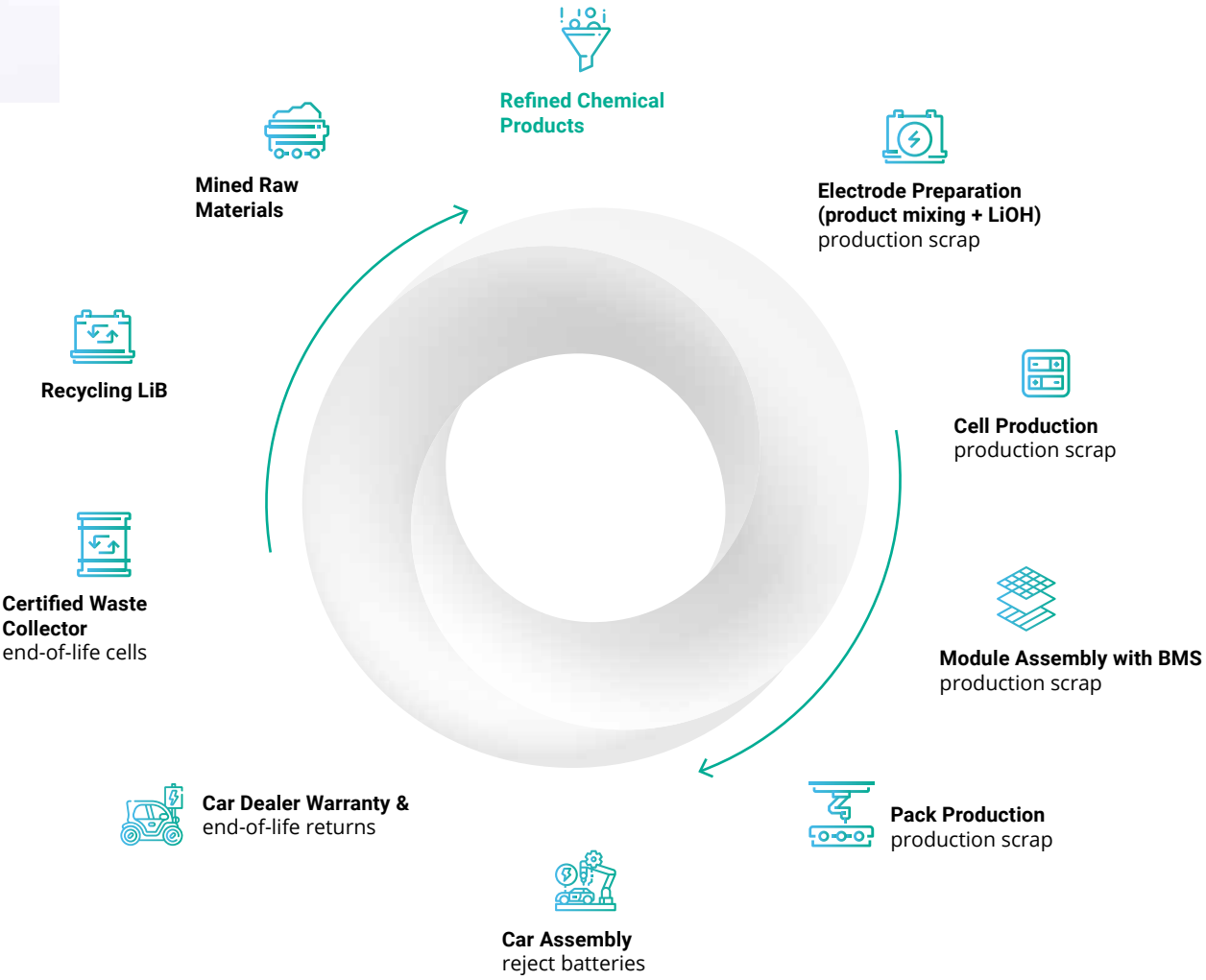
Future customers will benefit from the modularity of the technology and the business model. Horst Krenn, Managing Director of Primobius, fully supports this approach: “We at Primobius strongly believe in flexibility and have positioned ourselves accordingly. We understand that companies using batteries in their products, battery-cell producers and the recycling industry have very different requirements. We are ready to support all of them – as plant engineers, project developers, plant operators and partners.”

The ultra-clean chemicals recovered during the hydrometallurgical process can be reused in cathode or battery cell production without further treatment.

Primobius

Battery recycling without limits

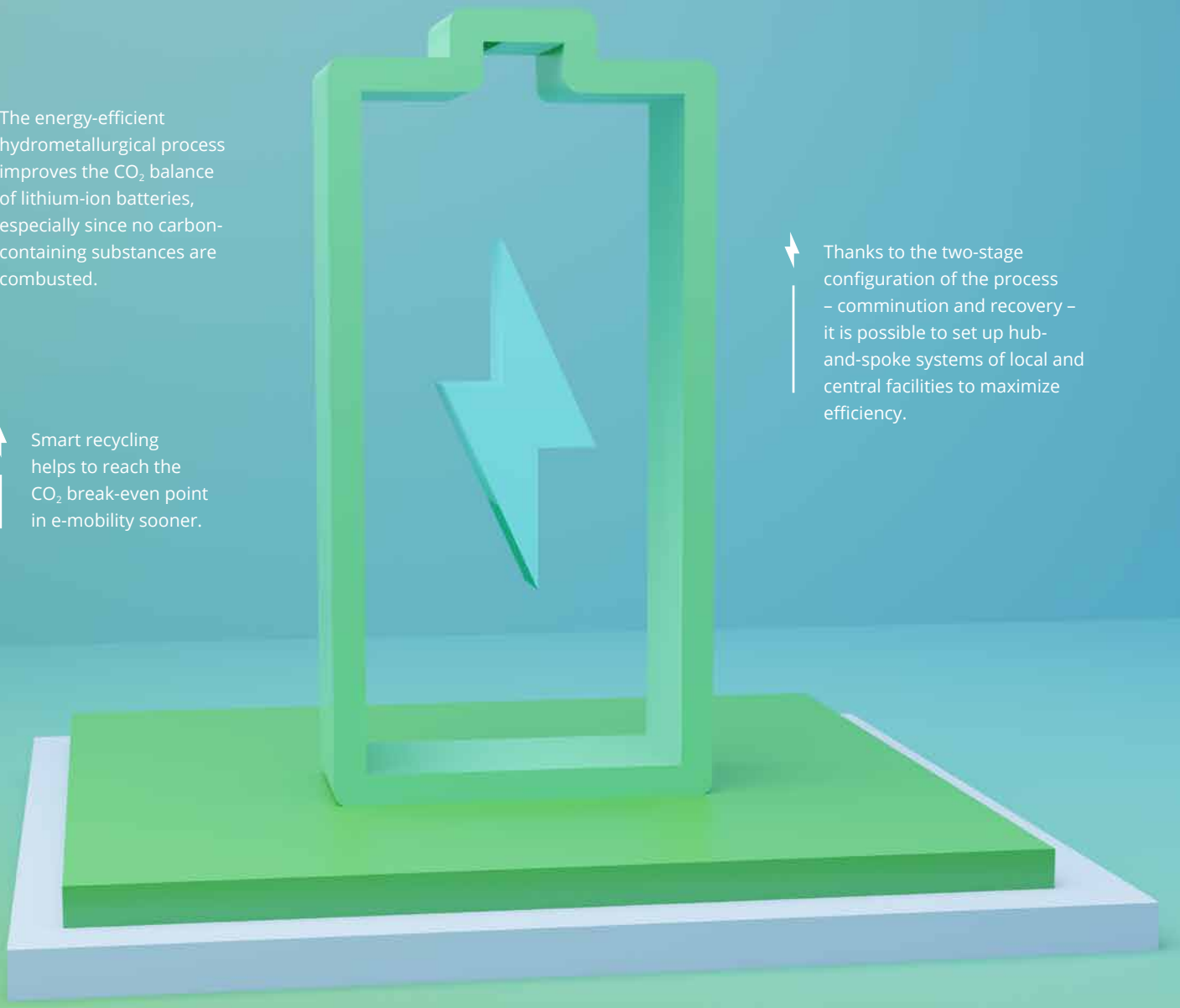
The innovative technology from Primobius can close the last gap in the value-added battery production cycle, providing battery producers and the automotive industry a solid planning basis and long-term supply-chain security – and a potential competitive edge.



Primobius helps achieve sustainability targets

The reclaimed materials – lithium, nickel and cobalt, for example – are ultra-clean and ready for reuse in battery (cell) production without any further treatment.

The energy-efficient hydrometallurgical process improves the CO_2 balance of lithium-ion batteries, especially since no carbon-containing substances are combusted.



Thanks to the two-stage configuration of the process – comminution and recovery – it is possible to set up hub-and-spoke systems of local and central facilities to maximize efficiency.

Smart recycling helps to reach the CO_2 break-even point in e-mobility sooner.

Comminution facilities near the battery collection points reduce the risk of fire and the risk of leaking hazardous substances.

Recycled materials are a substitute for primary raw materials, the mining of which is significantly more CO_2-intensive than recycling. At the same time, the operation of recycling facilities in Europe means that the materials come from ethically acceptable sources.

Assembly of the demonstration plant in Hilchenbach. The machine in the foreground comminutes the batteries and separates the material into plastic and metal fractions.

In order for potential customers to make their own judgment of the technology, Primobius has erected an industrial-scale demonstration facility in Hilchenbach, Germany. Primobius will use this facility to demonstrate to companies interested in the technology how the process works and what performance potential it provides. It is planned to use the facility for commercial recycling of spent batteries at a later stage. Primobius will also benefit from the test runs on the demonstration plant, as they will generate new data that can be used to further optimize the process.

The location of the demonstration facility has been chosen with specific circumstances in mind: "Arguments in favor of Germany include the country's central location within Europe and its good infrastructure, which is very beneficial in terms of logistics," explains Dr. Hans Ferkel, CTO of SMS group. "We also expect a surge in the demand for recycling solutions in the years to come, as – assuming that the e-mobility trend will continue to boom – the first generation of end-of-life batteries will begin filling up the collection points, waiting to be recycled." Therefore, the next logical step is already taking shape: the construction of a high-capacity, commercial-scale facility.

Good timing

Even today, Germany is in the lead in Europe as the country with the highest number of electric vehicles registered. German automakers have been making up ground in this field, launching more and more electric vehicle models recently. In parallel to this, we see production capacities for battery cells being established in Europe. Battery cell producers are in urgent need of lithium, nickel and cobalt supplies, which in the future shall come to an increasing degree from Europe-based recycling facilities. As without the availability of these metals recycled from spent batteries, it would be impossible for the automotive industry to meet its short-term production targets.

From all this we can expect a strong demand for recycling technologies. With the joint venture Primobius, we are well positioned to meet any requests from both carmakers and battery suppliers.

Actually, we have already received initial enquiries from cell manufacturers interested in experiencing live in Hilchenbach the performance capacity of the Primobius recycling process.

Learn more about the process and the demonstration plant in Hilchenbach here.

SMS group

NEW

For our customer Steel Dynamics Inc. in the USA, we are establishing an unparalleled steelworks including CSP® NEXUS plant.

A whole region is going to benefit from the construction of SDI's new steel production line. The infrastructure is being developedand new jobs created.

The city of Sinton in the federal state of Texas, USA, is home to the new steelworks of Steel Dynamics Inc. (SDI). With an annual production capacity of more than 3 million short tons (2.7 million metric tons) of steel, the plant is setting new standards in productivity. After a construction period of just two years, the plant complex will go on stream in the second half of 2021 and produce the latest generation of advanced, high-strength steel with strengths of up to 100 kilopounds per square inch (about 700 megapascals). These strong materials are used for architectural applications or for building light-weight car bodies, among other things.

DIME

PROJECT: STEEL DYNAMICS

NSIONS

KEY FACILITIES

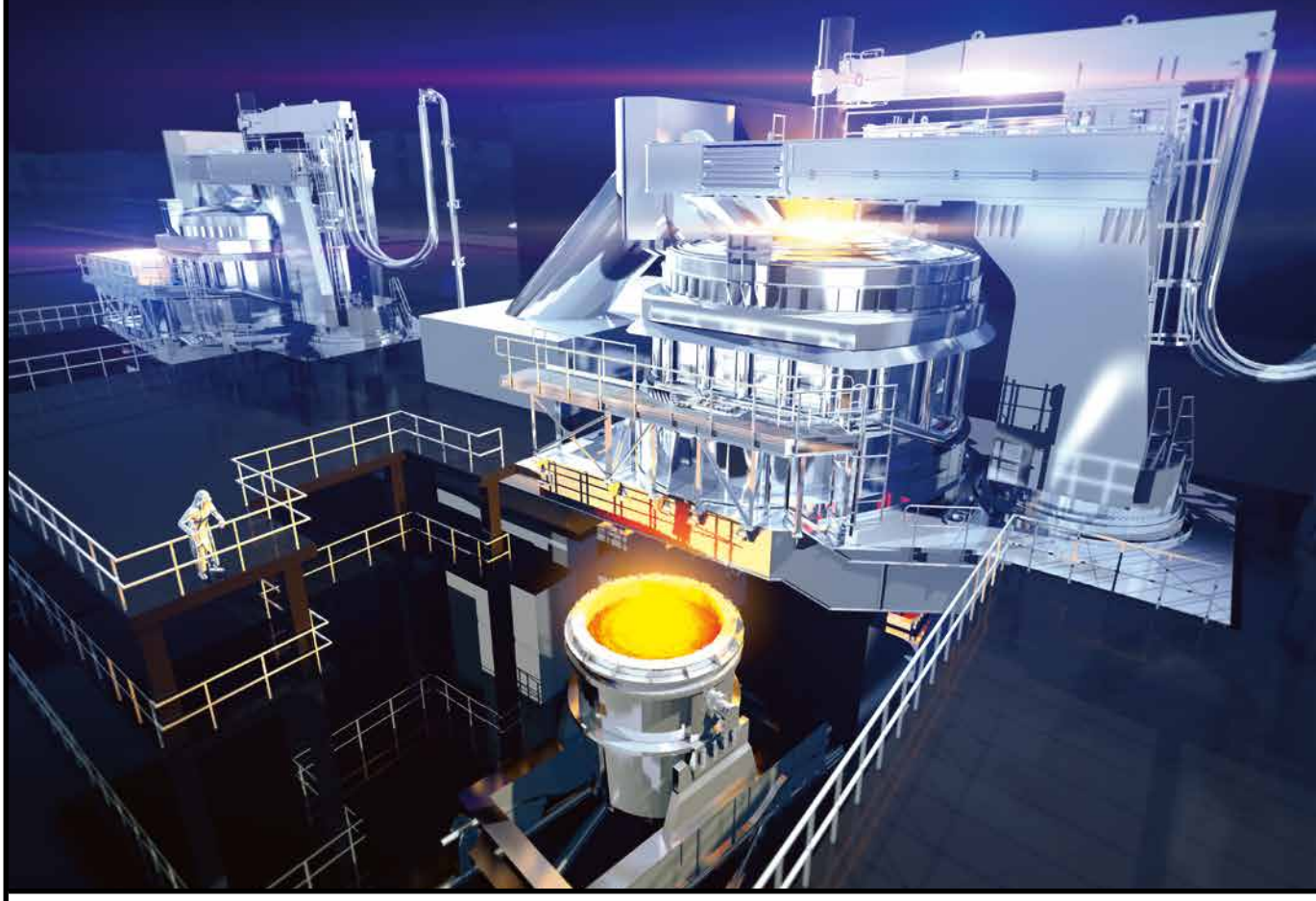
SMS group

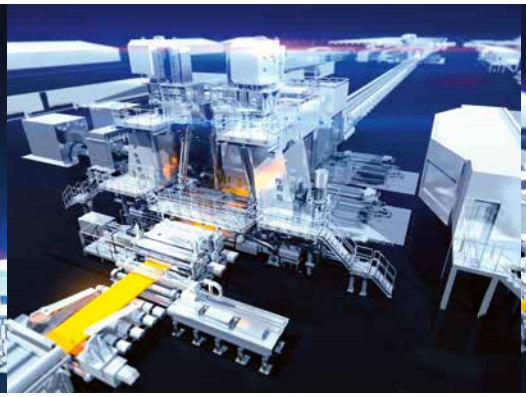
SDI selected SMS group to supply a complete steel production line: from the meltshop to the CSP® NEXUS plant, further to the combined pickling line/tandem cold mill, the galvanizing line and an offline skin-pass mill. The new, high-performance continuous caster, in combination with the proven thermomechanical rolling process, will allow the production of special steels in unprecedented dimensions. The Texas mill will have capabilities beyond existing electric arc furnace flat roll steel producers, enabling it to produce a maximum strip thickness of 1 inch (25.4 millimeters) with a strip width of 84 inches (2,134 millimeters).

1

STEELWORKS

The steelworks will be equipped with two electric arc furnaces, two twin ladle furnaces and a double vacuum tank degasser.





2

CASTER

For its new production line, SDI counts on a CSP® caster designed as single-strand curved mold plant.

3

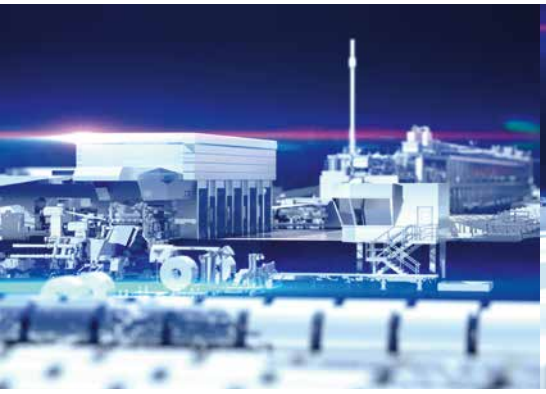
CSP® ROUGHING MILL

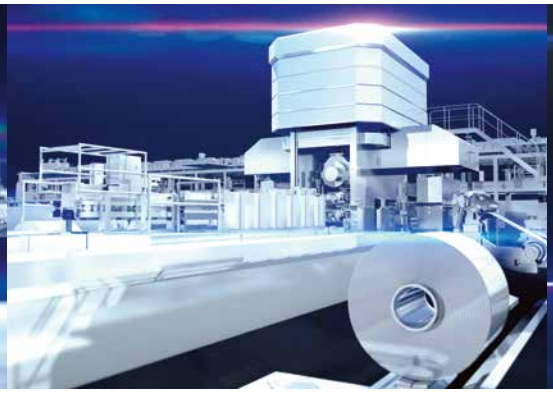
The CSP® roughing mill will have two mill stands.

4

CSP® FINISHING MILL

The finishing mill will consist of six further stands designed for the thermo-mechanical rolling process and for rolling special X80 steel grades.





5

PICKLING LINE/TANDEM COLD MILL

The pickling line/tandem cold mill downstream of the CSP® plant will have five stands and apply the latest turbulence technology.

6

TEMPER MILL

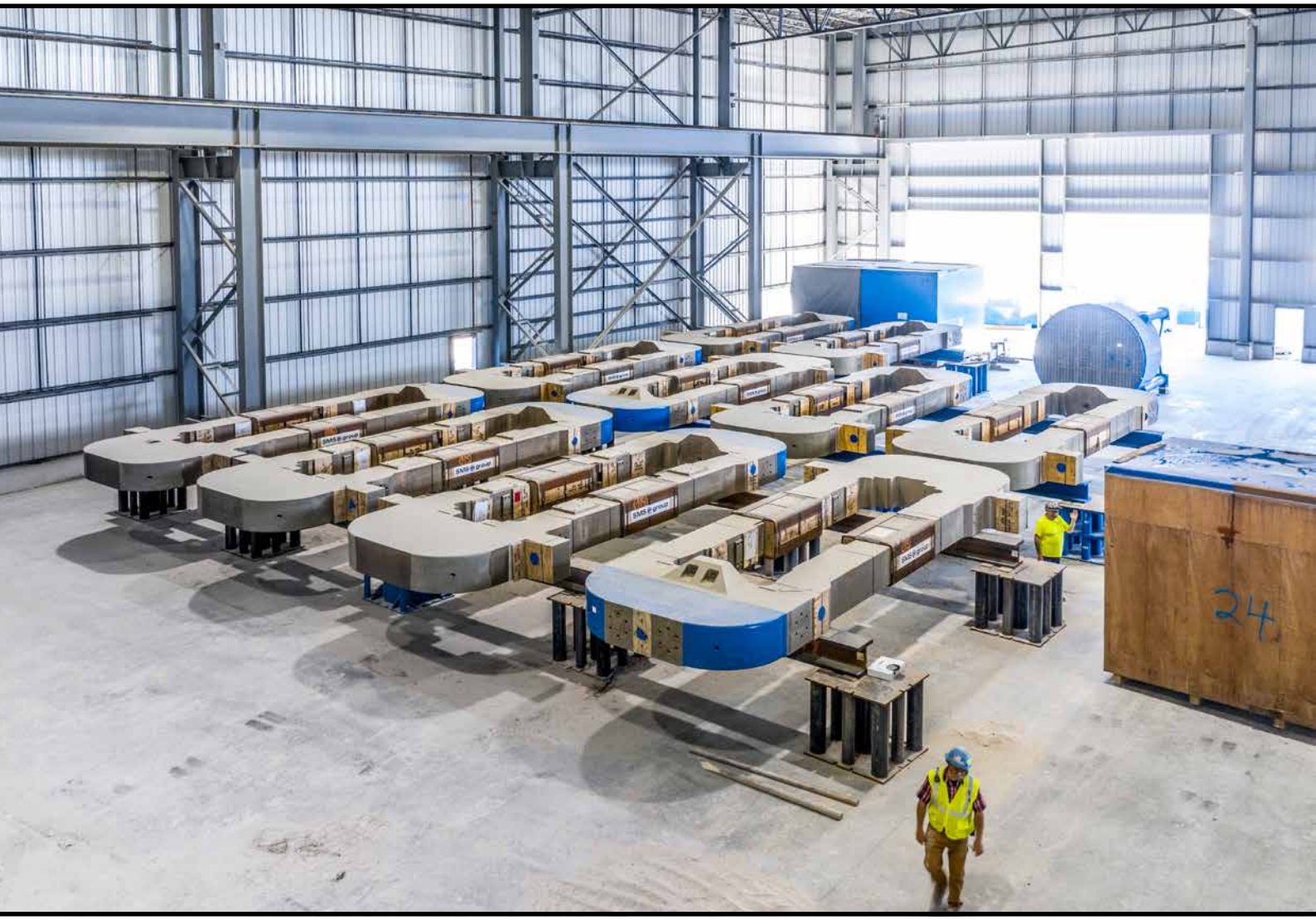
SDI's new skin-pass mill will be able to process hot and cold rolled strip, however, with the focus on cold skin-passing.

7

GALVANIZING LINE

The continuous galvanizing line will provide all conditions needed to process high-strength steel grades.

SMS group



Each of the mill stands for SDI weighs 160 tons.

In our global workshops we produce the high-tech equipment for our customer SDI that is being installed in Sinton. Despite the Corona pandemic, we were able to deliver even the heaviest plant components, such as the mill stands, to the construction site. Now, we are looking forward to the commissioning phase in which we will once again prove that SMS group is the Leading Partner in the World of Metals.

Roger Smith,
Project Director SDI, SMS group

The Plug & Work concept saves valuable time ahead of the installation and commissioning phase.

Integration has a long track record

In addition to mechanical equipment, we also supply electrical and automation system components and provide technical support to our customers during installation and commissioning. Before installing the equipment at SDI's site, the complete automation system is tested and pre-optimized at our in-house test centers. This way we make sure all functions are in perfect harmony right from the beginning and the production processes will run smoothly. The integration test has been known as the Plug & Work test for many years. Plug & Work helps to significantly shorten the period of commissioning and to accelerate the ramp-up phase. Additionally, the integration test offers the opportunity for the future operating staff to be trained by SMS group experts on the original control desks.

Trusting partnership

What makes such a large-scale project successful? The answer is: teamwork – within SMS group, but also with subsuppliers and, last but not least, with the customer. Constructing the new steelworks complex in Sinton, we are continuing the efficient and trust-based partnership with SDI that dates back to 1993. Our scope of supply will satisfy the customer's demands on product quality in hot strip production. Through this project, SDI will be in an excellent position to make products for the rapidly expanding markets of high-strength steel tubes, multi-phase steels for vehicle construction and structural steels.

HIGHLIGHTS

1

With an annual capacity of 3 million short tons (2.7 million metric tons) the new steel plant complex will set new standards in plant productivity.

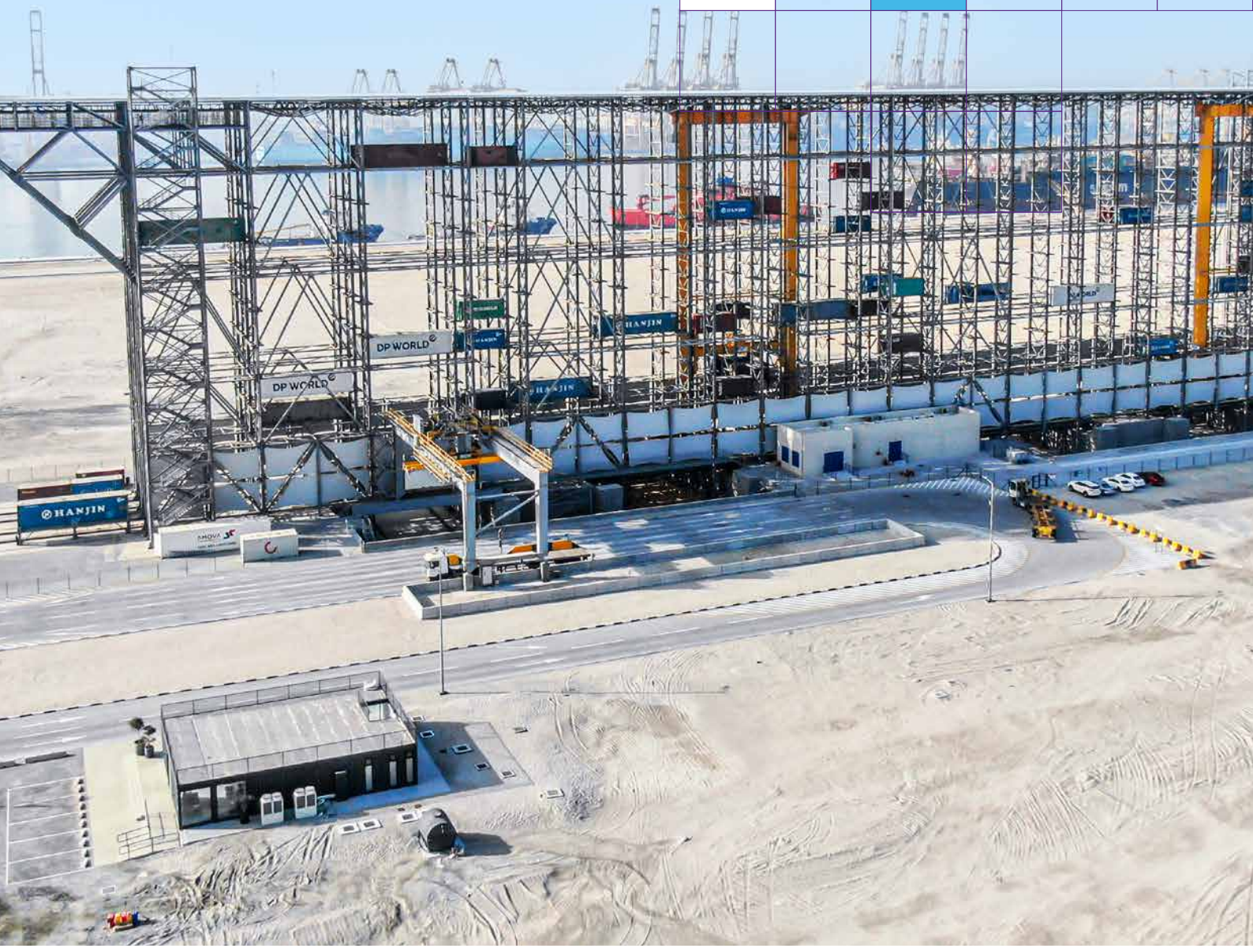
2

The supply scope of SMS group covers two electric arc furnaces, a CSP® plant, a pickling line/tandem cold mill, a skin-pass mill and a galvanizing line.

3

From the middle of 2021 on, the works will produce high-strength steel tubes, multi-phase steels for the automotive industry and structural steel.

BOX BAY



The future is vertical

How our technology is revolutionizing port logistics

Ports the world over are bursting at their seams. Worldwide, freight traffic has been growing continuously in volume. Today's modern container ships are much bigger than aircraft carriers. They can transport more than 24,000 TEU containers.[1] These gigantic freight volumes take most ports to their limits, as space behind the quay wall is limited, as is the overall capacity of the container terminals.

[1] TEU (Twenty-foot Equivalent Units) is a measuring unit commonly used in container logistics. 1 TEU equates to one standardized 20-foot container. However, nowadays 40-foot containers have become more popular. These containers are counted as 2 TEU.

Port operators are trying to get a grip on the situation by speeding up the ship loading and unloading processes. Thanks to the advances in crane technology, container cranes at the quays perform their work faster than comparable systems. Yet, this is not enough. Downstream storage yards must also be able to cope with the growing inflows and outflows of containers. In these yards, the containers are stacked on top of one another – up to six levels high. Experience shows that the higher the containers are stacked, the lower the efficiency becomes because – in order to access any of the containers at a lower level – the containers on top have to be shifted. This costs time and money.

High up – Successful erection of the first-ever BOXBAY High Bay Storage system at the port of Dubai. The plant has been running to the full satisfaction of the operator. All success criteria have been met or even exceeded.

Plenty of room at the top

The solution is called BOXBAY, a High Bay Storage system for containers that is able to store containers up to eleven stories high. Most importantly: Each individual container can be directly accessed. Compared to conventional solutions in container ports, BOXBAY achieves a more than three times higher storage capacity – on the equivalent ground space of an RTG-based terminal. The quay crane performance – an extremely important indicator for port operators – will increase by up to 20 percent. This means that, with BOXBAY, port capacities can be expanded without the requirement of extra ground space. This gives port operators an alternative to land development or reclamation and the negative impact these options often have on delicate land and marine ecosystems.

Approx. up to 20%

more containers per hour transshipped at the quay

Highlights

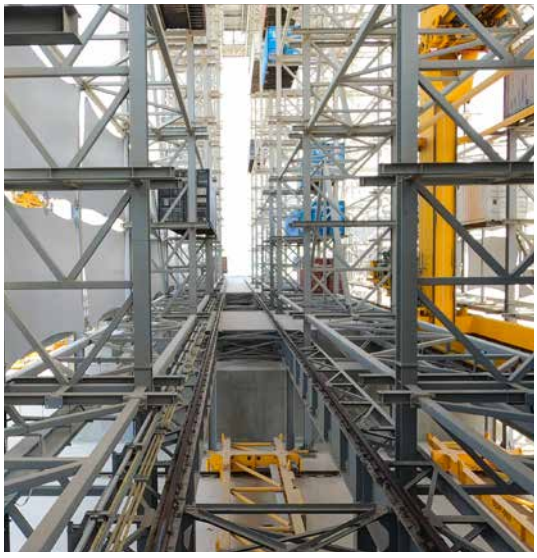
- **Higher storage capacity per ground space**
- **Efficient operation with no reshuffling required**
- **Higher handling rate per equivalent storage space**
- **Lower operating and maintenance costs**
- **Excellent eco-balance**

Here you find further information on the BOXBAY system.

We have developed BOXBAY in a joint venture with DP World, a leading port operator based in Dubai. As early as 2019, at TOC in Rotterdam, the world's most important trade fair for port, ship and terminal technology, experts from the logistics industry could get a first impression of BOXBAY – and recognize the system's maturity for practical operation. 2020 saw the erection of the first-ever BOXBAY system at the port of Dubai. During the EXPO in Dubai, DP World will present the system to the public at its pavilion on the fair grounds and organize tours of the facility in operation.

The initiators and driving forces behind the joint venture are looking forward to this event: "BOXBAY is a disruptive innovation that is setting entirely new standards in port logistics in terms of performance and storage capacity, and digitalization," says Burkhard Dahmen, CEO of SMS group. "We are convinced that our solution will increasingly replace existing systems." Sultan Ahmed Bin Sulayem, Chairman and CEO of DP World Group, also emphasizes the new system's future potential: "We are impressed with BOXBAY because it increases both the speed and efficiency of operations. These are key factors in running ports and terminals. We believe that this new system is a game-changing development for the global port industry."

The containers are stored in separate compartments on eleven stories.



The underfloor circulating pallet system interconnects the individual aisles of the BOXBAY store.

Not only ports will benefit

In the development of BOXBAY, the main emphasis was on meeting the requirements of the port operators – and on sustainability. The system scores with numerous benefits for the environment and for the people living near the ports:

— CO_2 emissions: All BOXBAY systems are exclusively electricity-operated. Consequently, they do not release any CO_2 emissions locally. Energy recuperation systems enable the recovery of electricity during container handling. In addition, it is possible to generate power by means of solar panels installed on the roof of the store structure, which – in sunny regions – can provide enough energy to operate the complete system. Depending on the green share of the electricity supplied by the local provider, the operation of a BOXBAY store can even be completely CO_2-free.

— Light pollution: BOXBAY does not need any lighting while it is operating. This means a higher quality of life for the local residents, especially at night time – and it saves on electricity.

— Noise abatement: Selected sides of the structure can be completely covered with soundproofing panels, which may even be greened. Not only do these green walls give BOXBAY a more appealing look, the living plants even capture particulates contained in the air, significantly improving the microclimate as a result.

These examples show that the port of the future will not only become smarter but also greener. According to Volker Brück, Director Business Development of BOXBAY, this is a very promising combination: “With BOXBAY, we implement an autonomous, eco-friendly and sustainable solution that sets new standards in every respect. I can’t think of any other system that fulfills such a wide range of requirements and has been designed with as much responsibility and consideration for the people who work at the ports or live in their neighborhoods. BOXBAY is an example, especially for future generations, that shows that economic efficiency and sustainability are not in contradiction but perfectly complement one another – if done smartly.”

BOXBAY has been designed with a clear focus on practical requirements. From the outset, our main concern has been to assure smooth operation by means of a straightforward, easy-to-handle concept that would not be more complex than absolutely necessary.

01

02 Collecting the containers

Stacker cranes pick the containers up at the transfer positions arranged at the aisle ends. From there, the cranes take the containers down the aisle between the racks to their dedicated slots. To save time, while on the way to their destination the cranes lift the containers up to the story where the respective slots are located. The stacker cranes serve both sides of the aisle. In other words, containers can be placed in and retrieved from racks to the right or to the left of the stacker crane. This is a novelty in container terminals, where much time and energy is usually wasted on the reshuffling of containers.

01 Container ship unloading

In container terminals with a BOXBAY store, unloading of the containers from the ships will still be performed by gantry cranes. Driver-operated or driver-less vehicles (terminal trucks, AGVs, straddle carriers) take the containers over and transport them to the BOXBAY store. There the containers are collected by stacker cranes.

02

03

03 Transport system and stacker cranes

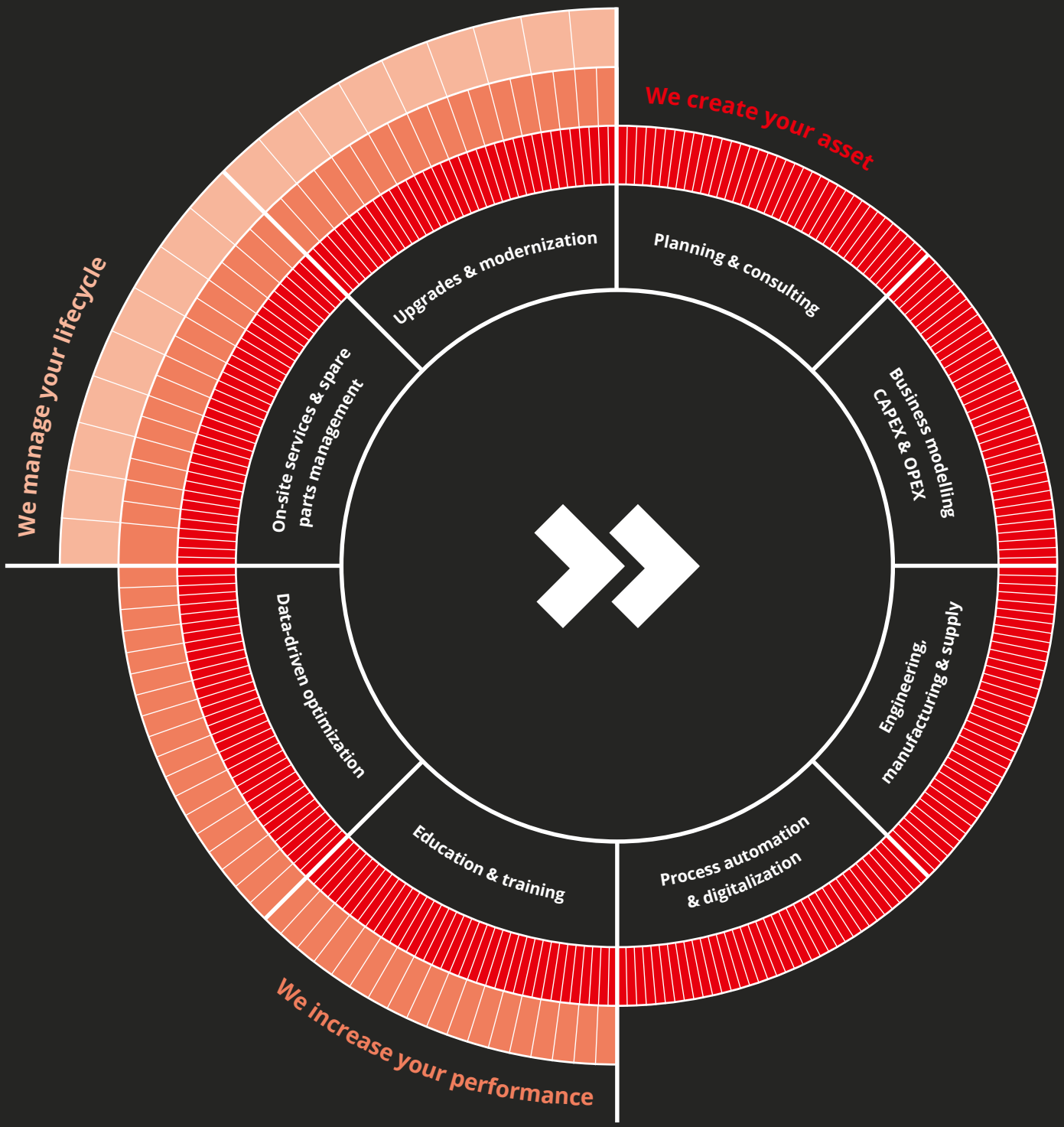
In the basement of the high-bay store structure, there is a rail-bound circulating underfloor transport system. The stacker cranes lower the containers they have retrieved from the store all the way down to the basement level, placing them on circulating transport pallets. Likewise, they can pick containers up from the pallets and lift them up to the racks. The pallet system transfers the containers to the land-side truck interface and takes the containers arriving at the land-side interface designated for export to the sea port storage yard.

04

04 Automation

In a BOXBAY high-bay store, two completely decoupled transport systems operate in parallel: the circulating pallet system and the stacker cranes. The movements of both the cranes and the pallets are perfectly harmonized using state-of-the-art digital technology. This boosts performance, speeds up operations and provides maximum flexibility. And, being equipped with the latest digital tracking technology, BOXBAY knows – at all times – the current position of each individual container. As each container can be directly accessed and there is no reshuffling of containers, BOXBAY is fast. Very fast.

03


We create your asset
We increase your performance
We manage your lifecycle
Planning & consulting
Business modeling CAPEX & OPEX
Engineering, manufacturing & supply
Process automation & digitalization
Education & training
Data-driven optimization
On-site services & spare parts management
Upgrades & modernization

For a long life

How we increase the value of facilities – over their entire lifecycle

The moment we pass on responsibility for a plant ready to go on stream often marks the beginning of a new phase of cooperation with our customers. We prefer to stay by their side throughout the complete lifetime of their plants. From training courses and spare parts supplies up to modernization projects and further to full-service maintenance and support in emergencies: Our value-adding portfolio of services is made to ensure our customers can focus on their core business.

We pursue an integrated service approach, in which we closely intermesh the classical areas of Technical Service, Automation and Digitalization. This trio enables us to enhance the performance of our customers' facilities by the combination of sensor technology, Artificial Intelligence and predictive maintenance, and – not less importantly – by mechanical equipment services. Moreover, with our data and process models, we achieve quality enhancements and reductions in operational costs. Based on this, we can offer our customers new, performance-dependent business models.

Our global team knows how projects become successful. Because to us the term "project" means more than just the erection of a greenfield facility. We consider the complete lifecycle of an investment and ensure a sustainable increase in efficiency. Our technology updates, for example, make sure our customers can continuously exploit the full potential of a plant. And whenever new market requirements are to be mastered, we will be prepared to react and modernize the equipment accordingly.

By means of our service measures, we are able to improve numerous parameters crucial to the long-term success of a plant, for instance:

- **Productivity** Increase in plant productivity and availability
- **Efficiency** Reduction of operating costs and elimination of bottlenecks
- **Quality** Improvement of primary product quality, reliable attainment of specified material properties
- **Health and safety** Higher workplace safety for the operating staff, better working conditions
- **Sustainability** Reduction of CO_2 emissions and energy consumption, resource conservation

We have developed new business models offering our customers long-term added value and strengthening our relationship as partners.

An example of the Software-as-a-Service business model is the Cracks Preventer from SMS digital. It combines artificial intelligence, metallurgical expertise and data know-how. This intelligent combination predicts defects and associated breakouts during casting and suggests corrective action in real time. The Cracks Preventer focuses on preventing cracks in the cast material, making it an essential part of the predictive quality system.

Many of our customers are looking for options to reduce investments and the amount of tied-up capital while focusing on their core activities. We can offer them models for components, machines and ancillary equipment they no longer have to buy. Instead, we make them available to our customers in combination with further services. Our Equipment-as-a--Service business models cover performance and service packages individually tailored to the customer's requirements, but with an enhanced scope as compared to conventional service contracts. This way, we can even improve operational processes that have been continuously optimized by our customers on the basis of their many years of experience. A simple Pay-per-Use financing model helps our customers reduce the costs of major investments in plant equipment.

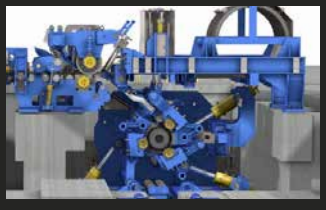
Selection of our innovative lifecycle offers

Cracks Preventer

Machine learning model predicting cracks and resulting breakouts

ThreadView

Autonomous, optical, online measuring system for OCTG threads



Downcoiler

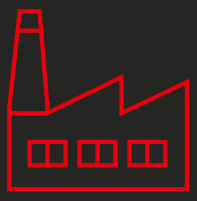
Maximizing the performance of core components (mandrel, pinch/wrapper rolls)

Forging plants

High-tech standard forging solutions with full-line digital service and consulting package

We create a strong basis for our customers to build on

We create your asset



Most plants start their lives as a greenfield project. Our global teams of engineers prepare a digital model during the planning and construction phase.

This model is the foundation for the development of all future plant functions and also serves as a basis for the manufacture of components, for integration tests and the training of personnel as well as for assistance and support in plant operation.

We manage your lifecycle

A modernization can breathe new life into a plant and make it fit for meeting future market requirements.

The use of advanced engineering tools and digital twins, intensive testing and optimizing of automation systems and existing equipment as well as the in-depth know-how we have acquired in the course of numerous sophisticated upgrades – the combination of all these measures and capacities make our modernization projects so successful.

We increase your performance

Markets are constantly changing. To keep up with the development it is vital to consistently adapt the technology of the plant.

We support our customers in tapping the full potential of their facilities as we can provide packages specifically tailored to their plants, customized hardware and software upgrades as well as expansion concepts to adapt plant functions whenever required.

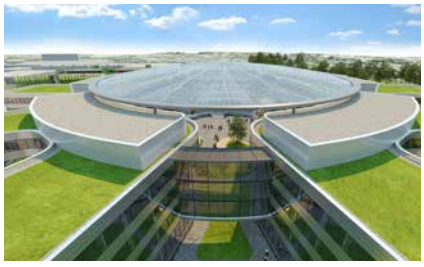
SMS group

Pooling expertise at the new headquarters

At our new Campus in Mönchengladbach, we are bringing together under one roof not only our employees from our locations on both sides of the Rhine River, but also our future-oriented competence fields Service and Digitalization. The Campus will enable us to work together even more closely – on our projects and for our customers. From 2023, the 44,000 square meter Campus will be home to about 1,500 specialists working in innovative teams. October 2020 already saw the groundbreaking ceremony for the Campus.

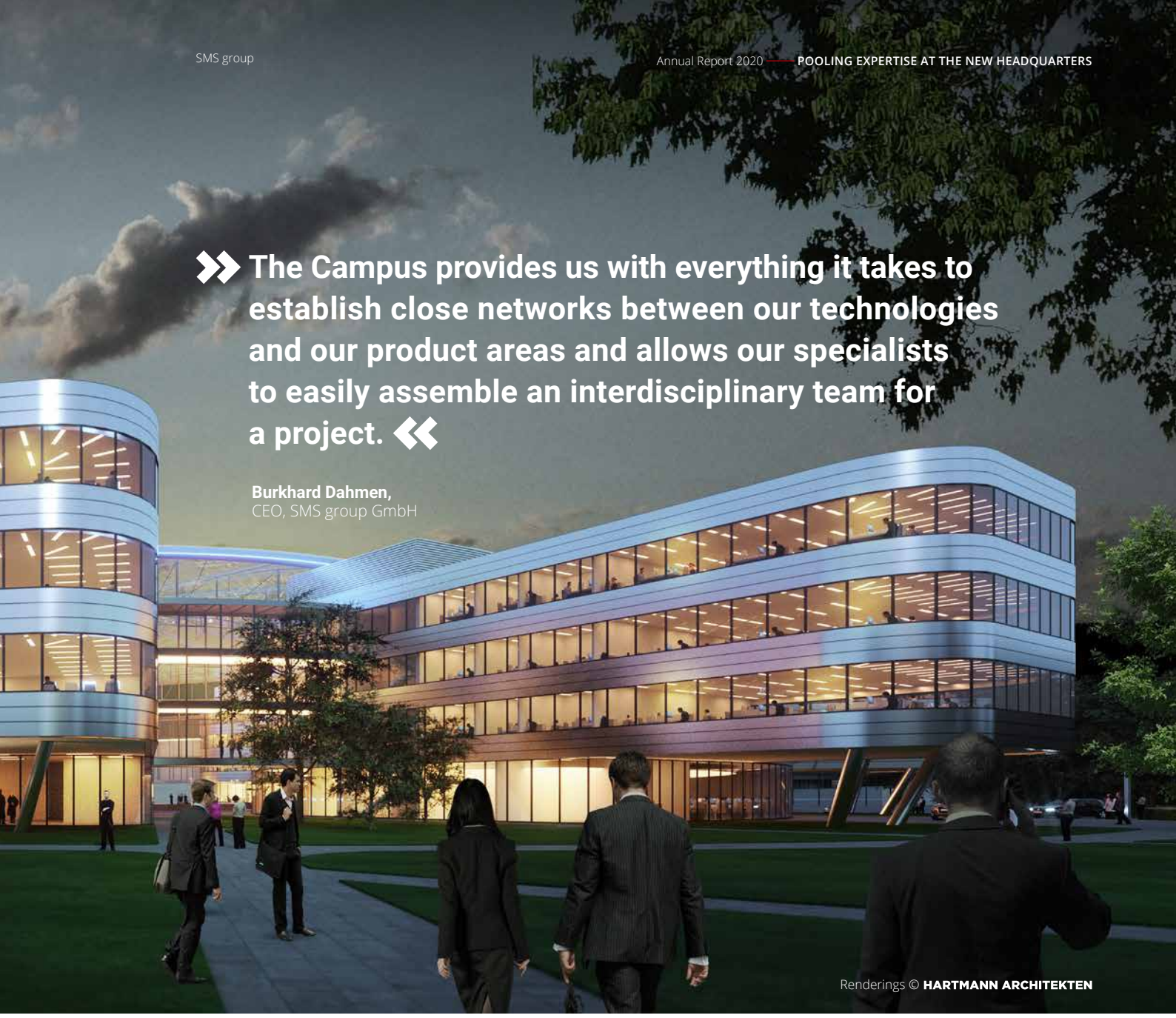
We live and care for **strong customer relations**

The close interlinking of our technical service expertise and our expertise in digital solutions makes us a strong and competent partner for our customers.



We develop **modern workplaces**

The new Campus provides a working atmosphere that promotes creativity and facilitates the exchange of ideas.



» The Campus provides us with everything it takes to establish close networks between our technologies and our product areas and allows our specialists to easily assemble an interdisciplinary team for a project. «

Burkhard Dahmen,
CEO, SMS group GmbH

Renderings © **HARTMANN ARCHITEKTEN**

We promote **ecological and economic sustainability**

When designing the Campus, we have been mindful of the growing demand for sustainable workplaces: from the recycling of materials during construction, to efficient building technology, flexible use of space in the office modules, and even green roofs.

We foster **innovation**

The new Campus provides the perfect environment for flexible project work in interdisciplinary teams that collaborate internationally, supported by the latest virtual technologies.

Projects around the world

In 2020, we were able to secure numerous new orders and implement crucial projects with best results. A selection thereof is presented in brief in the following.

ORDER — USA

Digital plant planning

North Star BlueScope, based in the USA, has awarded SMS digital an order for the integration of a comprehensive digitalization package. The solutions to be supplied will cover the complete production process and enable the integration of equipment from third-party suppliers.

ORDER — USA

Copper recycling facility

For Ames Copper Group we are establishing the first copper recycling facility in the United States for the production of copper anodes from copper scrap and copper fines. The plant will include a tilting refining furnace, an anode casting wheel and a gas cleaning system. The plant is scheduled to go on stream before the end of 2021.

COMMISSIONING PROJECT — USA

Successful capacity expansion

For the expansion of its steelworks in Osceola, Arkansas, we supplied to U.S.-American producer Big River Steel (BRS) all mechanical equipment, electrical and automation systems as well as the digitalization technology. This has doubled the mill's annual capacity to approximately three million tons of steel.

With a maximum strip width of 1,930 millimeters, it is one of the widest plants of its kind in the world: the No. 2 CSP® continuous caster with pendulum shear at Big River Steel.

ORDER — USA

Setting new records in the steel industry

To our U.S.-based customer Nucor we are going to supply one of the largest casters worldwide. The machine will produce ultra-wide and ultra-thick slabs.

The new bloom caster will have a nominal radius of 18 meters.

COMMISSIONING PROJECT — BELARUS

First cold strip coil

In August 2020, Miory Steel rolled the first coil on its new reversing cold mill (RCM). The RCM is part of a completely new, integrated and expandable production complex for the manufacture of tinplate. SMS group supplied all essential production equipment for the new facility, including the complete rolling and strip processing lines and the X-Pact® electrical and automation systems.

ORDER — GERMANY

Innovative contractual relationship

Outokumpu has selected us to supply a powder atomization plant which will be our first facility worldwide to be operated on the basis of a subscription contract. This means SMS will remain the owner of the plant, while Outokumpu, the operator, will pay us pro rata of the quantity of stainless-steel powder produced.

COMMISSIONING PROJECT — GERMANY

3D-printed hydraulic manifold block

At German forging company Gustav Grimm Edelstahlwerk GmbH & CO. KG, located in Remscheid, we put into operation a 31.5/34-MN high-speed open-die forging press. For the first time, we installed an additively manufactured hydraulic manifold block. As the 3D-printed component is made without joints, leaking of oil is securely prevented.

Demolition of the old press and installation of the new one, including subsequent acceptance tests, were completed within a period of just eleven weeks.

COMMISSIONING PROJECT — RUSSIA

New heat treatment line for large-diameter pipes

In Russia, Seversky Pipe Plant, a company of TMK Group, started up one of the world's largest and most productive facilities. Despite the COVID-19-related limitations, we were able to complete our mission in due time. The new line allows TMK to expand its portfolio by fully finished high-quality pipes for the oil and gas industry.

Plant overview of the line at TMK Seversky.

ORDER — CHINA

For next-generation aircrafts
Wuxi Paike, domiciled in China, will be well prepared for the manufacture of next-generation jet engines for the aviation industry. The company counts on the world's largest ring rolling machine used to produce components for aircraft engines. The machine to be supplied by SMS will roll engine rings up to maximum 1,500 millimeters high.

SMS group

ORDER — CHINA

Multi-talented extrusion press for the mobility of the future
Shandong Weiqiao Light Metal Co., Ltd., China, has placed an order with us covering the supply of a multi-functional light-metal extrusion press. This investment marks the entry into a new business area and enables the company to extrude products needed in the automotive sector, especially for the production of electric vehicles.

ORDER — CHINA

Steel industry with new world record
For its customer Jiangyin Xingcheng Special Steel Works Co. (JYXC), Ltd., China, SMS Concast will set up a cutting-edge caster able to produce round blooms of 1,200 millimeters diameter in a curved casting process – a record in steel production technology.

COMMISSIONING PROJECT — MALAYSIA

Complete energy distribution system supplied
At PMB Silicon we installed and commissioned two submerged arc furnaces (SAF) and supplied the complete energy distribution system for the facility.

COMMISSIONING PROJECT — THAILAND

Electric arc furnace upgrade
For Siam Construction Steel Company Ltd., Thailand, we modernized an 80-ton electric arc furnace. The Rayon works could be restarted after a downtime of just ten months. The improved sealing of the furnace, as a result of the upgrade, provides higher productivity and better operator safety.

ORDER — CHINA

High-precision rolling

Maanshan Iron & Steel Co., Ltd. (Masteel) has placed an order with our Austrian subsidiary TBK Automation und Messtechnik GmbH for the supply of the world's largest PROgauge laser-based light-section measuring system. The system will enhance the heavy section mill we installed at Masteel, enabling inline section measurement and analysis of surface defects that may occur during the rolling process.

TBK will supply the world's largest PROgauge laser measuring system to Masteel.

COMMISSIONING PROJECT — CHINA

Fit for coming infrastructure projects

The centerpiece of the plant: the CCS® (Compact Cartridge Stand) tandem rolling mill unit with hydraulic adjustment system and fully automatic quick program-change function.

Since 1993 already, Masteel has been operating heavy-beam mills from SMS group. Last year, the Ma'anshan location in China was expanded by another heavy section mill. In a fast ramp-up, the design capacity was not only reached but even exceeded. Masteel is the only Chinese manufacturer capable of producing beams with a root face thickness of up to 1,100 millimeters and a flange width of 500 millimeters, in addition to beams with a flange thickness of up to 130 millimeters. Such products are used in the bridge and building construction sector.

COMMISSIONING PROJECT — JAPAN

Extrusion technology for light metal on the road to success in Japan

UACJ Extrusion Nagoya Corporation will in the future produce light-metal automotive components at its Nagoya location in Japan on an extrusion press line supplied by SMS. The HybrEx®40 press, the core unit of the line, is one of our latest-generation presses which use hybrid drive technology to significantly reduce energy consumption compared to conventional extrusion presses.

ORDER — CHINA

Forging line for the Chinese car and truck market

Fully automatic 25-MN forging line with automatic walking beam system, die spraying unit and die holder, and with an ELO-FORGE L induction heating system.

Anhui Anhuang will be one of the first automotive suppliers in the field of massive forming in China capable of manufacturing pistons for cars and trucks in a fully automated process. The company has contracted us to supply a fully automatic closed-die forging line for pistons, which will be completed by an induction heating system for the forging blanks.

Consolidated statement of financial position

EUR THOUSAND	DEC. 31, 2020	DEC. 31, 2019
ASSETS		
Intangible assets	334,452	312,443
Property, plant and equipment	646,471	653,628
Shares in unconsolidated affiliated companies	4,011	13,433
Shares in investments accounted for using the equity method	68,567	70,237
Other equity investments	38,980	25,864
Investment securities	155,048	187,667
Deferred tax assets	63,228	78,140
Other non-current assets	12,052	32,846
Non-current assets	**1,322,809**	**1,374,258**
Inventories not including short-term contract assets	180,020	224,011
Short-term contract assets	626,082	611,304
Inventories	**806,102**	**835,315**
Trade receivables not including short-term contract assets	453,464	538,187
Short-term contract assets	302,722	371,722
Trade receivables	**756,186**	**909,909**
Receivables from income taxes	18,216	29,054
Other current assets	217,042	188,606
Securities	277,464	274,235
Cash and cash equivalents	741,570	695,196
Current assets	**2,816,580**	**2,932,315**
Total assets	**4,139,389**	**4,306,573**

EUR THOUSAND	DEC. 31, 2020	DEC. 31, 2019
LIABILITIES		
Issued capital	52,000	52,000
Capital reserves	499,264	499,264
Retained earnings	–213,504	–16,761
Income and expense recognized directly in equity	–13,698	17,338
Equity attributable to shareholders of SMS GmbH	**324,062**	**551,841**
Non-controlling interests	95,454	113,589
Equity	**419,516**	**665,430**
Non-current financial liabilities	65,771	56,599
Provisions for pensions and similar obligations	787,063	804,109
Deferred tax liabilities	93,058	99,963
Other non-current provisions	92,176	65,125
Other non-current liabilities	3,520	163
Non-current liabilities and provisions	**1,041,588**	**1,025,959**
Current financial liabilities	90,676	84,066
Trade payables	366,531	395,122
Liabilities from income taxes	18,602	27,796
Short-term contract liabilities	865,207	870,527
Other current provisions	1,187,227	1,085,486
Other current liabilities	150,042	152,187
Current liabilities and provisions	**2,678,285**	**2,615,184**
Total liabilities	**4,139,389**	**4,306,573**

Consolidated income statement

EUR THOUSAND	2020	2019
Revenue	**2,744,922**	**2,934,712**
Cost of sales	–2,325,700	–2,411,583
Gross profit	**419,222**	**523,129**
Selling costs	**–261,422**	**–291,115**
General administrative costs	**–124,866**	**–130,331**
Other income	59,738	45,712
Income from reversals of impairment on financial assets and contract assets allocated to the operating business	5,878	6,116
Other income	**65,616**	**51,828**
Other expenses	–254,912	–97,526
Impairment on financial assets and contract assets allocated to the operating business	–17,953	–9,641
Other expenses	**–272,865**	**–107,167**
Result from investments accounted for using the equity method	**2,277**	**3,301**
Net investment result	313	3,574
Impairment on other investments	110	–1,432
Net investment result	**423**	**2,142**
Earnings before interest and taxes (EBIT)	**–171,615**	**51,787**
Net financial result	3,719	14,341
Impairment on financial assets and contract assets	3,101	–2,089
Net financial result	**6,820**	**12,252**
Earnings before taxes (EBT)	**–164,795**	**64,039**
Income taxes	–7,365	–53,787
Net loss/net profit for the year	**–172,160**	**10,252**
Thereof attributable to:		
Shares attributable to shareholders of SMS GmbH	–172,109	9,751
Non-controlling interests	–51	501

Supervisory Board
SMS group GmbH

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