

# resilient

**Corporate Responsibility Report**  
of Messer 2020

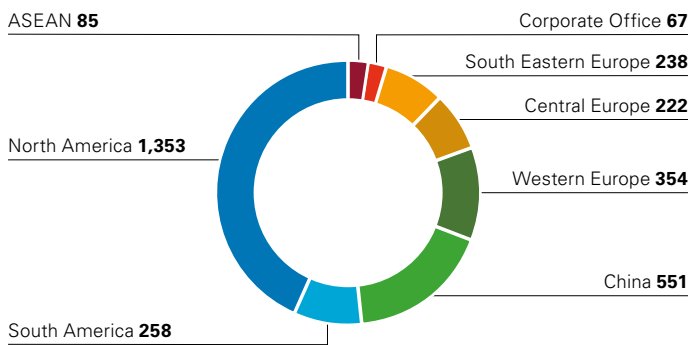
# Messer Key Figures at a glance

As of 31.12.2020

		Messer Group	Messer Industries*	Total**
Net sales	in million Euro	1,163	1,965	<b>3,128</b>
EBITDA	in million Euro	335	541	<b>876</b>
Investments	in million Euro	216	247	<b>463</b>
Employees	Contractual employment in FTE***	5,062	5,702	<b>10,764</b>

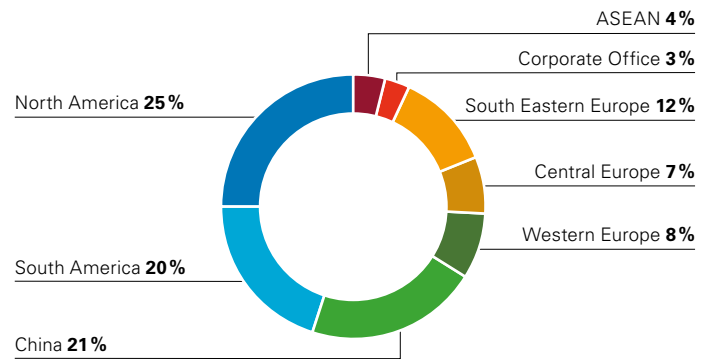
Net sales (consolidated) by region\*\*

in million Euro



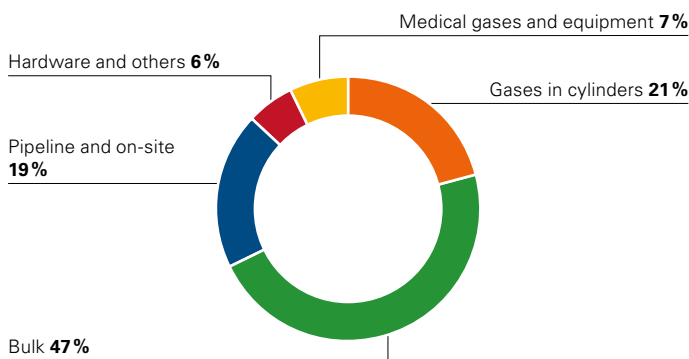
Numbers of employees by region\*\*

in percent



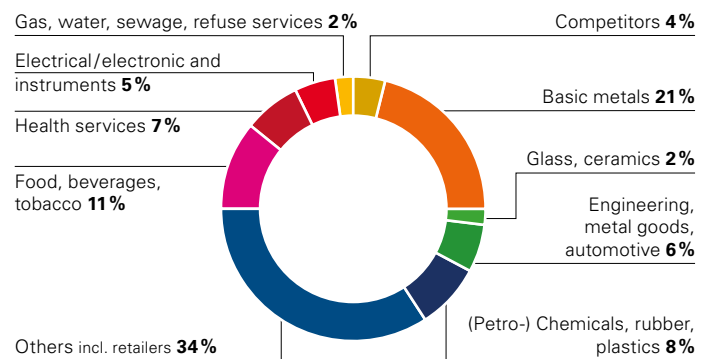
Net sales by product groups\*\*

in percent



Net sales by industry segments\*\*

in percent



\* Messer Industries GmbH is an at-equity investment of Messer Group GmbH. \*\*\* Full Time Equivalent

\*\* Messer Total is a purely mathematical sum of Messer Group and Messer Industries that includes 100% of the at-equity investment in Messer Industries.

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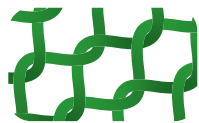
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# resilient

Perhaps an unusual term for a 2020 that has certainly been extraordinary.

Resilience refers to the ability of people to successfully adapt their behavior when faced with challenges or changes. This is a perfectly fitting description of our activity in the 2020 financial year: our team successfully overcame the economic challenges of the Covid-19 pandemic. And more than that: through extraordinary dedication, we exceeded many of our objectives.

This was possible because we applied our existing strengths to the new situation. Across countries, companies and departments, we acted as a team – at our facilities, but also through mobile work. Newly implemented safety concepts protected our employees. Procedures and logistics chains, especially for the supply of medical oxygen, were adapted to the new situation. We aligned our engagement to the changed needs of customers and markets.

Moreover, it proved to be true that our products and applications also constitute part of our resilience: for very many industries, they are indispensable. We can cushion singular and even global changes relatively well. Messer reacts rapidly, purposefully and effectively to the resulting challenges. And that's resilient in the truest sense of the word.



In 2015, under the aegis of the United Nations, the international community adopted Agenda 2030. It lays out 17 global goals together with the call to implement measures to achieve those goals. In essence, they seek to permanently preserve the natural basis of human existence and to enable people everywhere to live in dignity. Messer aligns its business activities with the 17 UN Sustainability Goals, which also form, in turn, the substantive framework of this Sustainability Report.

The background features a complex, abstract pattern of thick, wavy lines and circular shapes. The primary colors are red and dark blue, with some light blue and white areas. The lines and circles overlap and intersect, creating a sense of movement and interconnectedness. The text is centered in the upper half of the image.

# Strategic Integration of Corporate Responsibility

Our sustainable action in economic and social contexts derives not only from our own objectives, innovations and traditions but also from overarching aspirations and societal transformation.

In coming years, climate change will fundamentally transform markets: people and companies are already affected today by its impacts, the reorientation of social objectives and/or the associated adaptation of the market economy. We acknowledge

our responsibility in the transformation of the energy systems and want to help our customers make significant progress toward achieving the goal of climate neutrality.

As a family business, we think and act with the long term in mind, fulfill our social responsibility to our employees and society, and measure ourselves on our sustainable success.

# Sustainability Commitments of the Management

**We are committed to sustainability in our core areas: those areas are sustainable business with our customers and in the markets in which we operate, environmental and climate protection, safety, employees and society.**

“Messer is represented in major markets of the world: we respect the cultural differences and laws of the regions where we do business, contributing to communities and education systems there through a wide range of support activities. Mutual trust and respect for the diversity of people, open communication in collaboration, and the development of our employees are steadfast values that form the unalterable basis of our interaction with one another.

We pledge to follow sustainable business practices and safeguard our autonomy and independence through, among other things, far-sighted investment. In so doing, we provide long-term security to our employees and our business and financial partners in our collaboration with them.

We contribute to environmental and climate protection through the continuous improvement of our processes. Moreover, we also focus on developing technologies that make our customers’ production methods more efficient and eco-friendly.

With that in mind, our activities are focused on the safety of our customers, employees and partner companies as well as the safety of the equipment we install and that of our distribution channels.

Our continuous efforts to achieve sustainable improvements in the efficiency of our equipment and logistics processes and the

resulting conservation of resources are no less part of our core brand identity than reliable product supply at fair prices and our collaborative relationship with our clientele.

With all our stakeholders, we act with the utmost transparency. We view corporate responsibility as a business obligation with strategic utility, whereby we establish well-defined key indicators for control purposes, we have implemented them in our management organization, and we follow GRI (Global Reporting Initiative) standards in our sustainability reporting. We follow a documented Code of Cooperation and Conduct governing interactions with all of our stakeholders. Compliance with all applicable laws and regulations is a matter, of course, for us worldwide, as is protection of the personal data of our employees and business partners.

The success of our company is based, to a large extent, on the loyalty of our employees. We are committed to open-mindedness, diversity, tolerance and respect for cultural differences – without limitation or exception. Intolerance, racism and sexism are completely at odds with our company’s values. Our culture offers space for everyone – regardless of nationality, religion, ethnicity or sexual orientation – to develop on a free and equal basis. Diversity enriches us.”



Stefan Messer



Marcel Messer



Ernst Bode



Dr. Uwe Bechtolf



Jens Lühring



Helmut Kaschenz



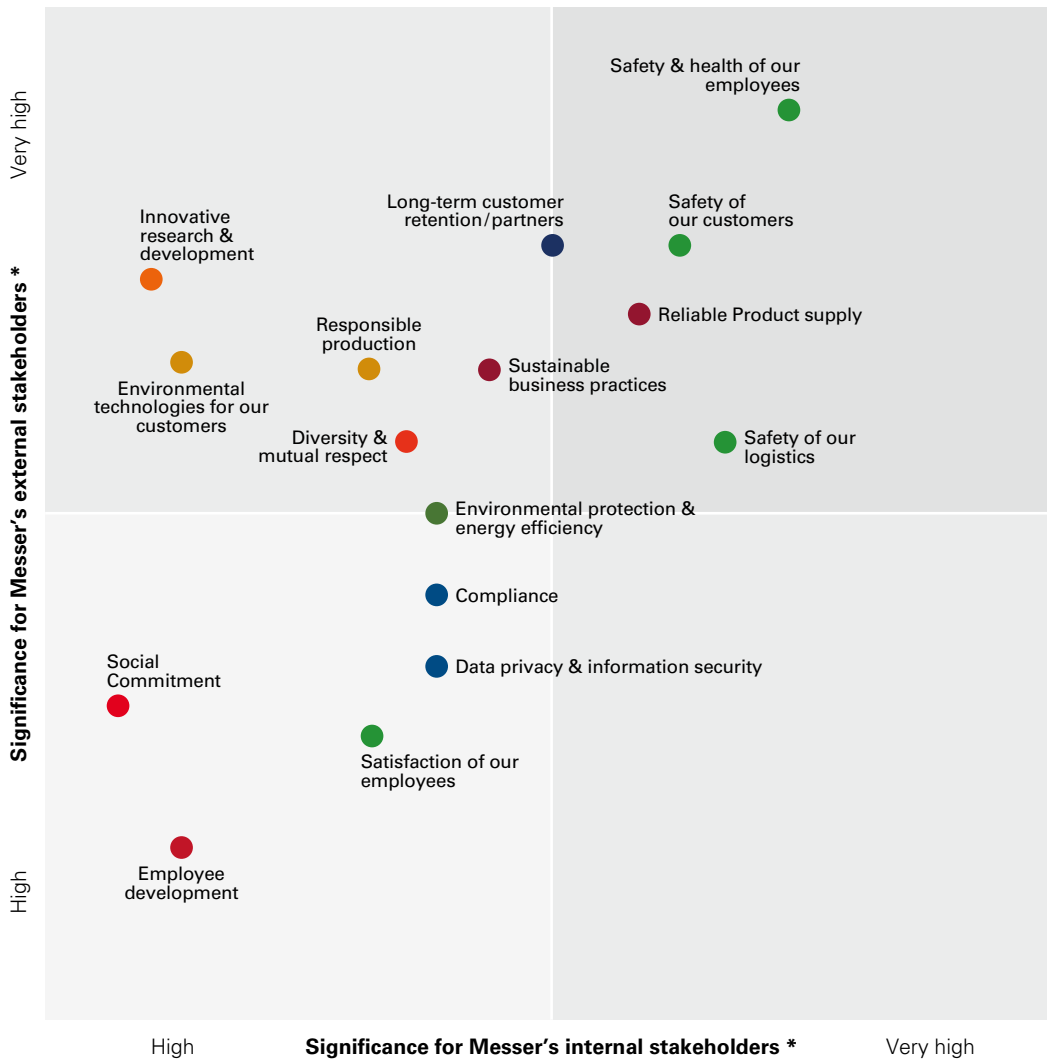
Gareth Parkin



# Development of our Materiality Matrix

The basic topics of our strategic sustainability process are defined by Messer’s daily and long-term activities and they are aligned with the 17 Sustainability Goals of the United Nations. When evaluating these topics, we consider it important to include representatives of all stakeholder groups. For that reason, we compiled a transparent list of 16 core topics, which have been voluntarily ranked by 45 senior managers and 771 employees via an anonymous online survey. Selected journalists, our customers, and followers of our social media

channels also participated anonymously in the online survey. As in previous years, the safety of our customers and employees is of utmost importance to our company. Our decisions can affect all major topics and also potentially impact both stakeholders outside the organization and the 17 UN Sustainability Goals. Accordingly, all major projects – both in-house and external to the organization – are relevant. The color coding clearly indicates the correspondence between our core topics and the UN Sustainability Goals.



\*internal stakeholders: internal stakeholder groups such as general managers and employees  
 external stakeholders: external stakeholder groups such as customers, suppliers, journalists and social media followers

Internal and external stakeholders remain in agreement that we can make our greatest social contribution in four thematic areas:

- Safety and health: we undertake to protect our employees, business partners and customers, and to ensure the greatest possible safety in the manufacture, transportation, utilization and handling of our products.
- Energy efficiency and the environment: we are mindful of environmental protection and the responsible treatment of resources in our own processes and in those of our customers.

- Diversity and equal opportunity: we build our corporate culture and our business strengths on mutual trust and respect.
- Customer satisfaction: we help our customers strengthen their performance, both economically and socially.

In so doing, we focus our work resources in the context of continuous improvement processes.

## The Responsibility of the Company

Customer and employee orientation, responsible action, corporate responsibility, open communication, trust and respect: all of these are embedded in Messer's mission statement.

In order to make those values – along with developments relative to sustainable action – measurable and comparable, Messer first introduced sustainability Key Performance Indicators (KPIs) in 2014.

We set measurable goals for ourselves in the different business units to document our improvements and development. We are publishing those goals in the present Sustainability Report for the financial year 2020. This year marks the first

time that we are publishing harmonized key performance sustainability-related indicators reflecting both corporate entities: Messer Group and Messer Industries. Although this reinforces our shared objective, comparisons between the present Sustainability Report and the previous year cannot always be drawn as a result.

This report is based on the UN Sustainability Goals and follows the G4 guidelines of the Global Reporting Initiative (GRI). At our customers' request, we also report on third-party agents, such as EcoVadis and the Carbon Disclosure Project, as well as on the worldwide "Responsible Care" initiative of the chemical industry.

	Unit	2019 Combined KPI	2020 Combined KPI
<b>1. Safety of our employees</b>			
Number of Lost Time Injuries (Messer employees)	number	44	<b>44</b>
Lost Time Injury Frequency Rate (Messer employees lost time injuries)	per million working hours	2.0	<b>2.0</b>
Lost Time Injury Severity Rate (Messer employees lost days)	per million working hours	45.6	<b>56.3</b>
Number of Recordable Working Injuries (Messer Employees)	number	97	<b>83</b>
Recordable Working Injury Frequency Rate (Recordable injuries)	per million working hours	4.4	<b>3.7</b>
Fatalities (Messer employees)	number of persons	0	<b>0</b>
<b>2. Safety of our logistics</b>			
Cylinder fleet: Number of preventable incidents	number	-	<b>64</b>
Cylinder fleet: Frequency Rate (Number of preventable incidents)	per million driven kilometers	-	<b>3.05</b>
Bulk Fleet: Number of preventable incidents	number	130	<b>194</b>
Bulk Fleet: Frequency Rate (Number of preventable incidents)	per million driven kilometers	-	<b>0.89</b>
Development of the distance travelled per ton (payload) of liquid industrial gas or cylinder gases delivered (Index 2019 = 100)	index	100	<b>101.9</b>
<b>3. Customer safety and satisfaction</b>			
Number of participants in customer satisfaction surveys across the Group	number	-	<b>3,927</b>
<b>4. Diversity, mutual trust and respect</b>			
Proportion of women overall	%	29.5 %	<b>28.4 %</b>
Proportion of women in first and second management levels	%	26.2 %	<b>24.0 %</b>
<b>5. Energy efficiency in production</b>			
Energy coefficient (Index 2018 = 100)	index	-	<b>99.9</b>
<b>6. Open communication and cooperation with stakeholders</b>			
Number of items of customer feedback regarding the content of the digital customer magazine Gases for Life	number	-	<b>2,056</b>
Total number of attendees at employee assemblies (townhall meetings) and international network meetings towards strategic integration and know-how transfer	participants	8,369	<b>15,559</b>
<b>7. Protection of the environment</b>			
CO <sub>2</sub> footprint of plants and logistic	Mio. t CO <sub>2</sub> e	4.82	<b>4.78</b>
Specific CO <sub>2</sub> footprint of plants and logistic	t CO <sub>2</sub> e / '000 Euro	1.55	<b>1.53</b>
Number of production/filling companies certified to ISO 14001/RCMS*	number	57	<b>59</b>
Water consumption	Mio. m <sup>3</sup>	17.3	<b>16.6</b>
<b>8. Employee satisfaction</b>			
Average length of service	years	9.8	<b>10.2</b>
Staff turnover rate	employee turnover rate	10.7 %	<b>13.2 %</b>
<b>9. Employee development</b>			
Proportion of apprentices and trainees in total workforce	%	-	<b>1.3 %</b>
<b>10. Compliance</b>			
Number of inquiries to the „Ask us help desk“	number	5	<b>6</b>
<b>11. Community engagement</b>			
Volunteerrism	Number of site volunteering	-	<b>153</b>
Community engagement events	Number of events	-	<b>237</b>

# Corporate Responsibility

## Messer Compliance Management System

The Messer Compliance Management System (Messer CMS) emphasizes our shared understanding of our fundamental values. It constitutes a mandatory framework for resolving conflicts of interest and ensuring compliance with applicable laws, regulatory provisions and the inter-company and company-internal policy guidelines within all divisions of the Messer Group. The managing directors and senior management are fully committed to the Messer CMS. As a value system, it serves to foster a relationship with our internal and external stakeholders that is based on fairness, solidarity and confidence. It supports those in charge of its establishment and implementation and also seeks to prevent violations of the Messer Code, if possible in advance.

<https://corporate.messergroup.com/en/compliance-management-system>

Messer Americas adheres to the Code of Conduct and also follows its own Code Supplement as well as a Supplier Code of Conduct. Other guidelines include a guideline on compliance with antitrust law, a guideline on anti-corruption (with the associated authorization form), a compliance guide for business partners (with a due diligence checklist and a sample agreement) and a data protection guideline for North America. These guidelines are available on the "Legal and Compliance" intranet site of Messer Americas.

### Compliance violations and cases of justifiable suspicion

The managing directors and senior management organize their area of responsibility in a way that continuously enables employees to report violations of applicable law or the Messer Code ("compliance violations"), as well as cases of justifiable

suspicion, in order to ensure prompt remedial action. In 2020, Messer received six reports through the corresponding hot-lines.

### New manuals for pesticides and Pharmaline gases

In 2020, the management of Messer approved new versions of the manuals for Plant Protection Products and Pharmaline gases within the Compliance Management System (CMS). The Plant Protection Products (pesticides) manual contains expanded guidelines on obligations pursuant to pesticides law for European companies concerning purchase of materials and

products, production, quality control, release, storage, marketing and sale of pesticides as well as the associated controls. The manual for Pharmaline gases contains expanded guidelines for European companies on obligations pursuant to pharmaceutical law and requirements of pharmacy customers as well as Pharmaline gases.

## Data security

At Messer Group GmbH, the Group IT Security Officer is responsible for coordinating security measures across all the individual companies, establishing standards, and developing the relevant expertise. By maintaining the crucially important availability of our systems, IT Security supports the sustainability of our digitalization, the physical security of our information, and the essential viability of our business processes. The IT Security services are elaborated by an international team of IT Security experts.

In the course of the year under review, we signed an agreement outsourcing most of the applications previously operated in the Messer Information Services data center in Gross-Umstadt, Germany. The purpose of this collaboration is the strategic and technical realignment of the Messer Group IT infrastructure with currently applicable, globally established standards, in order to make the IT infrastructure more effective, stable and secure, and thereby to create essential conditions for further efficiency and process improvements.

The realization of the project implements uniformly high security standards. Between December 2020 and the projected completion date of June 2021, all 110 locations of Messer Group and Messer Industries in Western Europe are to be connected to the IBM data center. Today's very inconsistent security-related infrastructure at the locations will be standardized and uniformly administered from a central location by a team of experts of the outsourcing partner.

At Messer Americas, cybersecurity risk assessment is embedded within the company's entire risk management program. This includes regular audits and analyses by third parties, in order to evaluate the overall cybersecurity situation and the fulfillment of the road map. The Executive Committee of Messer Americas is informed on the current cybersecurity status through regular updates provided throughout the year by the management, including the CIO and Information Services. The road map and the required financing for additional tools and resources are approved in this way.

## Data protection

Messer acknowledges its obligation to comply with applicable data protection regulations. Underscoring that obligation, appropriate structures have been established for the purpose of guaranteeing a continuously high level of data privacy.

The Group Privacy Officer of Messer Group GmbH is responsible for coordinating corporate Data Privacy and provides managerial support for the implementation of the data privacy policy by the national subsidiaries. Within the framework of the EU General Data Protection Regulation (GDPR) and the German Federal Data Protection Act (BDSG), we handle the data of our employees, customers and business partners in conformance with the law. We also implement the measures relative to organization and documentation pursuant to data protection law. Moreover, Messer's European national subsidiaries and Messer Group GmbH publish their data privacy statements in their national language on their websites.

Messer Americas complies with the applicable data protection laws. Data protection is handled in both Messer Group's Code of Conduct for America and in Messer Americas' Code Supplement. In addition, Messer Americas has adopted its own data privacy guideline for North America, which is available on the compliance web page of the Messer Americas' North American

Messer Americas regularly audits its Information Technology to protect against cybersecurity attacks and threats. Those audits cover end devices, servers, applications and data, along with cloud platforms, which are regularly monitored by members of the infrastructure and security organization, in order to ensure a rapid reaction to attacks, weaknesses or emerging threats. Messer Americas has IT security guidelines and procedures designed to ensure that the infrastructure, access and data are appropriately monitored and administered.

Employee awareness and training are an important part of Messer Americas' cybersecurity program. This is achieved through a combination of training, communication and the use of online tools that apply social engineering concepts to assess the employees' awareness and the potential vulnerability to threats and attacks (e.g. phishing, compromising of business e-mails, etc.).

intranet. Both the Senior Counsel & Regional Compliance Officer of Messer Americas and the Head of Human Resources for North America Business Operations are listed as contacts for questions and data protection topics. Members of Messer Americas' legal and compliance teams are also available throughout the Americas to answer questions and address issues concerning data protection. Messer Americas also relies on external legal consultants, who provide advice on compliance questions as needed, especially in South America. Data privacy instruction is included in Messer Americas' e-learning course on the Code of Ethics and Conduct, which includes a data privacy module. The "Code of Ethics and Conduct" e-learning course is mandatory for all Messer Americas employees.



## Sustainable, documented supply chain

A sustainable supply chain is one of the foundations of Messer's economic success.

The relationships between Messer and its key suppliers play a crucial role here. Those relationships are maintained by Messer Group GmbH's Logistics/Sourcing and Engineering/Production departments in their respective areas of expertise. These central departments take charge of or provide assistance with the Europe-wide purchasing of logistics services and special commodities, merchandise, facilities, machinery, and transport equipment, as well as vessels and containers. They are both ISO 9001-certified and have put in place robust and effective quality management systems as part of the certification process. Periodic audits of key suppliers are an essential part of supplier assessment.

The Production department helps the Messer national subsidiaries operate and maintain existing production facilities (troubleshooting, maintenance planning, know-how transfer/training, standardization) with the goal of production process optimization. The centralized computer-aided monitoring and control of equipment are used to reduce energy consumption and thereby, continuously improve the profitability and CO<sub>2</sub> footprint of our plants. Optimization opportunities developed in regular process and energy audits are consistently implemented.

The Engineering department is responsible for all technical and procurement-related aspects concerning the implementation of projects for the production of all types of gases, primarily within Europe. This includes the development and construction or conversion of plants that produce technical and medical gases. In addition to plant design, project management and construction management, this work also encompasses everything ranging from the procurement/purchasing of all

required components to plant start-up. Important factors in the design and construction of new plants include the incorporation of findings and values obtained through plant and equipment operation to improve the efficiency of production facilities along with the use of technically high-quality, durable and energy-efficient components. A small group of specialists focuses on the advanced development of our processes. In that continuous further development work, we use the latest process design programs and software tools.

In collaboration with Messer GasPack, Logistics/Sourcing ensures the availability of products (all kinds of gases) and their transportation, for both Messer and its customers. This also includes the development of new logistics concepts and the rollout and operation of optimization and monitoring tools. In addition, the department handles and/or coordinates the procurement of tankers, stationary customer tanks and vaporizers throughout Europe; the procurement, lease and periodic inspection of pressurized tanks and fittings; the procurement of electricity for the production facilities; and the procurement of gases from external sources. Logistics/Sourcing also helps the national subsidiaries manage transport contracts and organize the transportation of heavy loads. Handling these specialized functions on a centralized basis not only provides economic benefits, but it also serves to maintain consistently high-quality standards throughout the company.

In 2020, the Covid-19 pandemic sharply restricted the ability to conduct supplier audits. All outstanding audits will be completed as soon as the situation allows again.

The audits focus primarily on the production process, the quality of the products manufactured, and sustainability. Since 2018, the key suppliers have also been required to adhere to the principles of the UN Global Compact, placing additional focus

not only on sustainability but also on human rights, environmental awareness and working conditions, among other things. In the event of an unsatisfactory assessment, we work together with the supplier to develop measures to improve performance. Critical non-compliance leads to rejection of the supplier.

Messer Americas used the internal assessment system to audit more suppliers in 2020. About 28.8 percent of suppliers were rated “excellent,” 57.5 percent were rated “satisfactory,” and 13.7 percent were rated “substandard.”

Messer Americas’ Procurement group handles product category management, strategic procurement and expenditure management within the procurement organization, in order to achieve savings while complying with health and safety standards at the same time. Messer Americas’ sourcing team is strategically aligned to the business and has expertise in the categories Indirect, Plants and Production, Merchant Packaged Gas, Customer Engineering Services, Logistics and Fixed Assets. In that context, Messer Americas’ sourcing team focuses on Category Management, Contract Lifecycle Management, Supplier Relationship Management and Compliance. Procurement is an integral part of our organization and works together with the operative team on all current investments. Messer Americas’ sourcing team is subject to Messer Americas’ procurement policy and Messer Americas’ procurement guidelines.

Messer Americas’ Procurement group maintains a supplier management system to guarantee quality and compliance with our standards of operating performance, safety, the environment and social responsibility. Messer’s suppliers must submit a binding acknowledgment of our Supplier Code of Conduct Declaration. Moreover, Messer in the USA measures compliance with our standards by demanding compliance with our Conflict Minerals Declaration and our Supplier Quality Declaration.

Messer Americas has a highly dedicated team of energy experts who manage electrical power, Messer’s largest variable cost. The energy team works closely with the operations team to maximize utility and efficiency by reducing power consumption during periods of high electricity prices or electrical grid emergencies.

In deregulated energy markets, the energy team has developed and implemented a strategy for direct wholesale electrical power procurement, which enables Messer to purchase electrical power directly from wholesale energy markets. The energy team uses an energy risk management program, which has provided Messer with lower and less volatile electrical power costs. In regulated energy markets, the energy team works closely together with utilities, authorities and other interest groups to ensure that Messer obtains fair and reasonable electrical power rates in line with operating costs. Messer Americas’ energy team works closely together with local, state and federal authorities to obtain allowances that reflect the operating flexibility and energy efficiency of Messer’s plants. Moreover, Messer’s participation in various industrial groups also helps shape national and state energy policy concerning current issues such as green energy, sustainability, reaction to energy demand, and the resilience of the electricity grid.



The image features several thick, flowing maroon ribbons that create a sense of movement and interconnectedness. The ribbons are set against a plain white background. In the lower-left quadrant, the text "Sustainable Business" is displayed in a bold, black, sans-serif font. The overall composition is clean and modern, with a focus on organic, fluid shapes.

**Sustainable Business**



## Messer's strategic orientation

Messer Group acquired the majority of Linde AG's gases business in North America and certain Linde and Praxair business activities in South America effective March 1, 2019 in a joint venture – called Messer Industries GmbH – with CVC Capital Partners Fund VII ("CVC"). Messer Group contributed, among other things, the majority of its Western European companies to the joint venture.

Over the course of the next few years, the joint venture will be fully integrated into the family-run Messer Group, thereby, establishing a global gas group under the leadership of the Messer family. Messer Group's regional operations are focused

on Eastern Europe and Asia. Asia represents the world's largest industrial gases market and is expected to have the highest growth rate in the medium term. In 2019, with Messer Industries' participation strategies for continued, sustainable business were developed for the Americas and Western Europe. The common aim that they all share is to achieve safety, customer focus, profitable growth and fair payment for our products through a team culture focused on efficiency, success and motivation in combination with innovation and a highly satisfied workforce and clientele.

### Efficiency increase through digital improvements

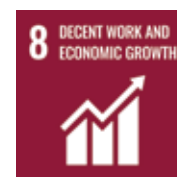
Messer Group and Messer Industries Western Europe are pursuing the goal of a strategically and technically reoriented IT infrastructure with modern, globally established standards. A standardized and flexibly scalable IT structure will create the basic conditions for improved business processes, for greater efficiency, flexibility and agility. Online collaboration and protection against cybercrime will also be reinforced.

Moreover, Messer continuously invests in a visible, modern internet presence that offers visitors satisfactory information and an easy means of contact. User-friendly e-services, online shops and search engine-optimized content will help customers find the desired search results and thereby, make their purchase decision. In operation since October 2020 under the banner "Perfect Match," the expanded digital platform now includes local e-services and online shops for hardware products such as pressure regulators and cylinder valves. Warehouse inventories and personalized sale prices can be displayed here.

Employees in the USA and Canada have access to a new SharePoint-based intranet for greater productivity. The new

communication platform is compatible with mobile devices. Among other things, it offers a search function, links to support tools and process support tools, and quick links to frequently visited resources and websites. The new SharePoint-based intranet solution will also be available in South America, thereby, increasing networking opportunities for employees of our subsidiaries in both North and South America.

Since 2020, ASCO Carbon Dioxide has been offering digital add-on products to its customers in the dry ice production segment: the "i-Series Product Line" develops the potentials and benefits of networking and IIoT (Industrial Internet of Things) for their dry ice production units. Based on sensor components and state-of-the-art communication technology, ASCO offers services in the area of remote access, remote data and remote management services to interested companies. With this development – just like with the market launch of the new portable CO<sub>2</sub> safety detectors – ASCO is addressing specific customer requests.



## Sustainable growth through investment

Characterized by its long-term operations, the industrial gases sector is establishing the foundation for sustainable growth,

### **Germany: Air separation unit at Saint-Gobain Isover**

In October 2020, Messer started up its third air separation unit in Germany. It is located in Speyer on the grounds of the insulation manufacturer SAINT-GOBAIN ISOVER G+H AG. The oxygen it supplies to the company improves the efficiency of the burners in its glass melting operation. With this additional

especially through investment projects. The following projects, for example, were initiated or completed by Messer in 2020.

unit, Messer is reinforcing its presence in southwestern Germany. Supply routes to a large share of our local customers have already been shortened considerably. Rastatt-based Basi holds a stake in the unit and takes some of the liquid products.

### **France: CO<sub>2</sub> recovery unit in Lacq**

Messer extended its partnership with Vertex Bioenergy and is building a new, fully automated CO<sub>2</sub> recovery unit at its location in Lacq. The unit can be operated remotely and is part of Messer's long-term corporate strategy. At the same time, the unit supports the expansion of the CO<sub>2</sub> business in northern Spain. With this investment of about 11.3 million euros, Messer

is doubling its future production capacity in Lacq to 130,000 metric tons of raw CO<sub>2</sub> per year. Start-up is planned for July 2022. Vertex Bioenergy's Lacq plant produces 235 million liters per year of biofuel made from corn. That makes it a European market leader in the biofuel industry as well as the leading biofuel producer in Spain and France.

### **Spain: Construction of fifth air separation unit begins**

Messer has started construction of a new air separation unit in Vilaseca near Tarragona. It will be Messer's fifth unit in Spain. In the final expansion stage, its daily production capacity will reach 2,400 metric tons of nitrogen, oxygen and argon. The unit is being built on the grounds of Messer's filling plant there, which will remain at the site: only a few tanks and one filling unit will be converted. The project is scheduled for completion by December 2021. The new production unit will be connected

to Messer's pipeline network to satisfy the increasing demand for oxygen and nitrogen to serve the chemical industry in Tarragona. The region's manufacturing companies will also be supplied with gases – liquefied in tank trucks and in gaseous form in gas cylinders. During the planning and construction phase, some 200 people will be working on the project; after completion, Messer will employ more than 20 people at the new unit.

### **Poland: VPSA unit for oxygen supply**

Saint-Gobain Isover has been active on the Polish market since 1993 with its own production of insulation materials made of glass wool and mineral wool. At the Gliwice site, oxygen is used to optimize the combustion process of the glass wool

and mineral wool furnaces. In 2020, Messer signed a long-term agreement to supply oxygen from a Vacuum Pressure Swing Adsorption (VPSA) unit. The new VPSA plant is scheduled to go into operation in April 2022.

### **Czech Republic and Slovakia: Takeover of Air Liquide**

In 2020, Messer took over the companies of Air Liquide in the Czech Republic and Slovakia. The acquired operations include a total of four on-site units for oxygen and nitrogen as well as a filling plant for cylinder gases. Messer has already been active in Slovakia and the Czech Republic since 1991. Prior to this acquisition, Messer in Slovakia had three-cylinder gas filling

plants, one hydrogen unit and three on-site units. In the Czech Republic, Messer previously operated one air separation unit with a direct pipeline supplying three major customers as well as twelve on-site units, two-cylinder gas filling plants and one acetylene plant.

### **Hungary: Recovery and storage of methane**

Messer started up a new unit that recovers and stores high-purity methane at the site of a fertilizer manufacturer in Hungary. Methane is a byproduct of treating the purge gas from the ammonia plant. It is separated out of the process and stored in liquid form with a purity of more than 99.5 percent. The unit has a capacity of 700 metric tons per year. High-purity methane

has a wide range of applications: it is used as calibration gas for heating and combustion equipment, for example, and as fuel in aerospace testing. It is also used in an extremely wide range of applications in the chemical industry and in the manufacture of carbon fiber components such as brake linings.

### **Slovakia: Argon recovery**

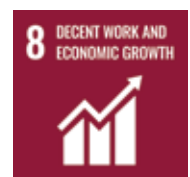
In the course of installing an argon recovery unit in Slovakia – a project of Messer's Slovakian subsidiary in collaboration with Messer's engineering team in Krefeld, Germany – two argon

storage tanks with a capacity of 200 cubic meters each were installed.

### **Slovenia: Longest underground pipeline for nitrogen**

In July 2020, Messer in Slovenia put into operation our longest underground nitrogen pipeline made of polyethylene to date. The supply line is 8,028 meters long. The project was carried out in collaboration with Messer's engineering experts from Krefeld, Germany. Along its course, the pipeline crosses more

than 200 plots of land, one stream, one main road, and one natural gas pipeline before finally reaching our customer, a tire manufacturer in Kranj. The pipeline carries high-purity nitrogen from our air separation unit in Škofja Loka.



### **USA: New carbon dioxide unit in California**

In 2020, Messer started up a new carbon dioxide (CO<sub>2</sub>) unit in Keyes, California. Messer is supplying existing and new customers in northern California and the surrounding regions from this new plant by rail. The new unit produces up to 450 metric tons of CO<sub>2</sub> per day, which is used in carbonated beverages

and to freeze and chill food products as well as in the electronics industry of the region. Messer recently began working with Aemetis, Inc. and taking raw CO<sub>2</sub> from its ethanol plant for processing. Messer operates two other CO<sub>2</sub> units and two air separation units in California.

### **USA: New air separation unit in Georgia**

In 2020, Messer started up a new air separation unit in Adel, Georgia, investing more than 40 million dollars in the highly efficient plant. It supplies gases to companies across the southeastern U.S., strengthening Messer's presence in that

fast-growing region. Our customers there serve the healthcare sector, produce food and beverages, manufacture metal and glass, and operate independent welding and gas centers.

### **USA: Largest production unit for atmospheric gases in Delaware**

The air separation unit we successfully started up in Claymont, Delaware, in 2020 is our largest atmospheric gases production unit currently in operation in the USA. Its investment cost was about 100 million dollars. The unit produces up to 1,200 metric tons per day of liquefied gases such as oxygen, nitrogen and argon. It also supplies gaseous products via pipeline to cus-

tomers up and down the Delaware River. The Delaware Valley metropolitan region's customer base spans almost all industries, including metal processing, the food and glass industry, chemicals, healthcare and the energy sector. Thanks to the latest technology, our unit features extremely efficient energy consumption – which is also one of the ways we help reduce CO<sub>2</sub> emissions.

### **USA: Strategic investment in Indianapolis, Indiana**

In 2020, Messer in the Americas started the construction of a new, state-of-the-art air separation unit in Indiana. This 38-million-dollar investment in Indianapolis as a business location underscores our strategic commitment to further expansion in the USA. The expansion of our production capacities will enable us

to satisfy the increased demand for industrial, food-grade and medical gases throughout Indiana and the Midwest. We currently operate seven sites in Indiana and employ about 90 people there. With the new investment in Indianapolis, we are creating an additional 23 permanent jobs.

### **China: Production plant at the new site in Kunming**

In August 2020, an air separation unit went into operation at Messer's new production site in Kunming. The plant is located in the Anning Industrial Park in Yunnan Province in southwestern China. It will be operated by the subsidiary Anning Messer.

With a production capacity of 300 metric tons per day of liquid oxygen, nitrogen and argon, it will supply our customers both in the industrial park and in the surrounding area.

### **China: Two new production units in Hunan**

To meet Xiangtan Iron & Steel's increased gas demand, Messer started up a new air separation unit on the Xiangtan site. It has a capacity of 1,400 metric tons per day of gaseous oxygen. A new air separation unit has been installed in Ningxiang near the

provincial capital of Changsha. With a capacity of up to 600 metric tons per day of liquefied gases, it is designed to meet the processing industry's rapidly increasing demand and to reinforce Messer's leading market position.

### **China: Doubled production capacity in Shunde, Guangdong**

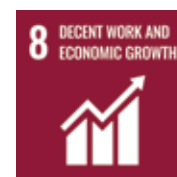
At the Shunde site, Messer has built a second air separation unit and doubled the production of liquefied gas to more than

1,200 metric tons per day. Most of the additional product will be consumed by the rapidly growing electronics industry.

### **Thailand: First filling plant for gas cylinders**

In Thailand, Messer started out strictly as a distributor delivering gases by tank truck from China and Vietnam. At the same time, an application engineering department was established. Its specialists provided specific expertise to support a continuously growing customer base. Along with delivery of argon, nitrogen,

oxygen and carbon dioxide by tank truck, gases are now also offered in cylinders. A storage facility for liquid argon was installed in Samut Prakan, and in September 2020, Messer filled the first cylinders at its own new filling plant in Bangpoo. Messer now supplies medical oxygen to medium-sized hospitals.



## Awards for sustainable management

### **Messer – A winner of the Axia Best Managed Companies Award 2020**

After 2016 and 2019, Messer, the world's largest family-run industrial gases specialist, has once again earned the Axia Best Managed Companies Award in 2020. Presented by Deloitte, WirtschaftsWoche, Credit Suisse and the Federation of German Industries (BDI), the award and stamp of quality recognizes extremely well-managed companies. The company had already earned this award in 2016 and 2019. As one of the award

winners, Messer once again impressed the jury with its first-class business management characterized by high innovative force, a strategy focused on the long term, and strong governance structures. In justifying the award, Deloitte observed that Messer is not only a benchmark for extremely well-managed medium-sized companies, but at the same time emblematically represents the future of Germany as a business location.

### **Switzerland: Once again awarded the "Credit Rating Certificate"**

In 2020, the credit agency Bisnode D&B Schweiz AG granted Messer in Switzerland a "Credit Rating Certificate" with "Risk Indicator 1" (which stands for minimum default risk) for the tenth consecutive time. Only two percent of all companies in Switzerland meet the requirements for that best category.

The certificate sets Messer in Switzerland apart as a trustworthy, reliable, financially healthy and stable business partner. Bisnode D&B is a partner in the network of Dun & Bradstreet, the world's largest service provider for business-to-business economic data.

## Engagement in the economic sphere

### **The owner's personal commitment**

Stefan Messer is a member of the General Assembly of the Frankfurt am Main Chamber of Commerce and Industry (IHK) and Chairman of the foreign trade committee. He is also an Honorary Senator of the Technical University Darmstadt and Honorary Senator of the Goethe University Frankfurt, as well as a member of the board of trustees of the Faculty of Economics and on the board of trustees of the China Institute at the Goethe University Frankfurt and a member of the steering committee of the Deutsche Universitätsstiftung (German University Foundation). In addition, he is a member of the board of the German-Swiss Chamber of Commerce, a member of the advisory committee for the FrankfurtRheinMain economic initiative, a member of the advisory committee of Mainova AG, a member of Commerzbank AG's advisory committee for the state of

Hesse, a member of HDI Gerling's state advisory committee. He is also a member of the Friends of the German-Vietnamese University and sits on the board of Dachser Group SE & Co. KG. Since January 2009, Stefan Messer has been Honorary Consul of the Republic of Slovenia for the consular district of Hesse, Rhineland-Palatinate and Saarland. He is also involved in the association "Die Familienunternehmer" (The Family Entrepreneurs) and in the foundation "Stiftung Familienunternehmen" (Foundation for Family Businesses), which support the fundamental values of a social market economy, in particular free enterprise. Furthermore, Stefan Messer is a member of the steering committee and board of the East Asian Association (OAV) and Chairman of the inter-state committee on Thailand.

## Involvement in industry associations

Messer Group is a member of the European Industrial Gases Association (EIGA). The Brussels-based association represents nearly all European companies that produce and market industrial, medical and food-grade gases. The association's members cooperate with the aim of achieving the highest possible safety and environmental standards during the production, transport and use of gases. Messer is also a member of the IOMA (International Oxygen Manufacturers Association), the German Committee on Eastern European Economic Relations, and the German Asian-Pacific Business Association. Messer employees are represented on all governing bodies of these associations. The Messer Group is a member of the German Welding Society (DVS e.V.). The DVS is a non-profit, technical and scientific association based in Düsseldorf. Messer employees are involved

in expert committees, support research projects, and establish and maintain contact with expert groups in technologically advanced fields. The subsidiaries are engaged in various local industry associations. The Messer companies are also involved in organizations in their local regions. The following is an abridged list of associations in which Messer Americas is a member: American Chemistry Council (ACC), Compressed Gas Association (CGA), Chemistry Council of New Jersey (CCNJ), Texas Chemical Council (TCC), California Large Energy Consumer Association (CLECA), Indiana Energy Consumers, West Virginia Large Energy User Group, West Virginia Manufacturing Association, Pennsylvania Energy Consumers Association, and Ohio Energy Group.



An abstract graphic composed of several thick, vibrant red ribbons that swirl and loop across the page. The ribbons originate from the left side and fan out towards the right, creating a sense of dynamic movement and interconnectedness. The ribbons overlap and cross each other, forming a complex, organic pattern. In the upper left corner, a circular element is partially visible, featuring a light red gradient band.

**Messer Team**



## Diversity and equality

Diversity and equal opportunity are anchored in our mission statement. Our forward-looking and sustainable Human Resources policies ensure a level playing field for professional success, respect cultural differences, and promote interaction

### Diversity management

The goal of our diversity management program is to create a respectful work environment that is free of prejudice, regardless of the employees' gender, nationality, ethnic origin, religion, ideology, disability, age, sexual orientation or gender identity. With that purpose in mind, we have established an interdisciplinary team.

Since 2019, Messer Group has been a recipient of the Total E-Quality Award for equal opportunity in personnel and organizational policy with the special citation for diversity. Valid for three years, the award is supported and recommended by the German Federal Ministry for Family Affairs, Senior Citizens, Women and Youth as well as by the German Federal Ministry

among each other. For Messer, diversity is essential to innovation and sustainable business success, and mutual trust and respect form the basis of our corporate culture.

of Education and Research. In addition, we are signatories to the "Diversity Charter," an initiative that promotes diversity in companies and institutions under the patronage of German Chancellor Dr. Angela Merkel.

Contact persons responsible for diversity management will continue to strengthen and anchor it in our national subsidiaries. Moreover, our Diversity Team is already creating an international in-house training program to reveal and combat the employees' "unconscious biases," which represent one of the major impediments to the implementation of diversity strategies.

### Share of women and equality

As of December 31, 2020, Messer employed 10,764 people; on December 31, 2019, that figure was 11,063. The share of women was 28.4 percent versus 29.5 percent in the previous year; 24 percent of managers in the first and second levels of management were women, versus 26.2 percent in 2019. The decrease was partly due to a 9.1 percent reduction in the share of women in Messer Group GmbH, which was attributable in part to a change in the definition of second level management. To motivate women to accept a leadership role, since the start of 2021, team or project managers who report to first level management are now also counted as second level management.

The share of women will be increased over the long term. To that end, among other things, equality at Messer was analyzed in 2020. For example, a study was conducted to determine whether there are any inappropriate systematic inequalities in remuneration. A review of salaries paid to women and men in comparable functions revealed no gender-specific discrimination against women.

Our salaries are based on function, market, performance, education, experience and number of years of service, as well as any collective wage agreements or comparable collective wage agreements and adjustments for inflation. It goes without saying that our remuneration policy makes no distinction among genders.



## Diversity Report

In December 2020, Messer published the first Diversity Report. In the meantime, we have compiled additional data that will be published in a Diversity Report in May 2021 and annually thereafter. The key indicators of the workforce relative to male or

female gender are collected anonymously along with length of company service, age distribution and nationality. This monitoring will help us achieve the established objectives and manage the subject.

## Satisfaction of our employees

In 2020, the average company service of our employees since they joined Messer was 10.2 years. Employee turnover was 13.2 percent.

Messer in Hungary established an onboarding program to improve the integration of new colleagues: new employees are assigned a personal mentor, who help to get them situated during their first months on the job and who are ready to assist

them in a wide range of matters. The program also includes short assignments in other departments to promote a better understanding of those roles and provide interdisciplinary context. This lets new employees get to know their key contacts better, which builds greater social cohesion and a feeling of comfort and security. Their direct supervisors discuss the integration process with them on a monthly basis.

## Satisfaction surveys

Messer conducts employee surveys in Europe and the Americas. In Europe, 1,421 people participated in the survey; that represents 46 percent of the European workforce. The results point to an emphasis on work safety as well as a strong, committed corporate culture: 92 percent of respondents, for example, agreed that safety is the highest priority at Messer; 92 percent also indicated that they were satisfied with how Messer has handled the Covid-19 pandemic. 94 percent of participants said they were proud to work for Messer; and 89 percent agreed that they have a positive feeling about the direction in which Messer is headed. When asked to name three areas on which our local management is focusing greater attention, respondents identified employee development, communication and digitalization.

Since the end of 2019, Messer Americas has been conducting surveys at six-month intervals, in order to determine the needs and requirements of the workforce and to establish appropriate employee development programs. In the most recent survey at the end of 2020, 54 percent of employees in the Americas participated. As in Europe, the employees gave particularly positive assessments of the safety culture and pandemic management and also strongly agreed with the strategic direction and mission of the company.

## Education, advanced training, know-how transfer

Messer is committed to the education and training of talented young professionals, who represent an important investment in the competitiveness and capability of our company. Some of that training takes place at various locations, supplemented by multi-week assignments abroad. In 2020, the training quota at Messer was 1.3 percent.

### Qualification offensive

We made good use of the time during the lockdown to qualify employees. Our "Messer Innovation Forum" advanced training platform for application engineering is designed for our customers, sales representatives, sales managers, application specialists and technicians. One of the aims of the forum is to transfer know-how from the individual divisions and departments to

Open dialog and in-house transmission of expertise are important to us. That's why we promote the establishment and maintenance of cross-regional and intercultural networks. In 2020, employees participated 15,559 times – in most cases virtually – in site conferences or network meetings for strategic integration or know-how transfer. By contrast, that figure was 8,369 in 2019.

the national entities and subsidiaries. In the first half of 2020, our application specialists conducted a total of 100 webinars, for which 1,920 colleagues in Europe, Asia and the Americas registered. The software and the presentations were also made available to our teams in France, enabling them to train some 400 additional participants at the national level.





**Safety and Health**

Safety – both for us and for our customers – when handling our gases, safety in the workplace, be it on the shop floor or in the office, and plant safety, as well as safe logistics and vehicles – all these elements are of fundamental importance to our customers, partners and employees. This is clearly reflected in our materiality matrix. Health and safety at work are firmly

### **Our handling of the coronavirus pandemic**

The general managers of each subsidiary along with the SHEQ and HSEQ officers at Messer Group and Messer Americas make sure that appropriate emergency and crisis plans are in place. These plans establish an organizational and communications structure that can deliver a rapid, decisive and coordinated response to all kinds of emergencies and crises. In the case of the coronavirus pandemic, that means convening pandemic

established in our company as well as our industry as a fundamental element. In our mission statement, our internal guidelines and our organizational approach, safety is a central feature for all business units, enabling our employees to implement individual measures aimed at continuous improvement.

teams in accordance with the existing pandemic plans: teams that, partly in consultation with public health authorities, provide protection and, therefore, safety for the employees. The measures taken have been very successful so far: a low infection rate across a worldwide workforce of about 10,800 people speaks for effective coordination – and outstanding discipline on the part of the employees.

## Safety

### **Safety of our employees**

A network of safety officers at Messer studies and documents all safety-related incidents at Messer and provides, among other things, information and training materials on how to handle our products and applications safely, along with safe practices at the different workplaces. In 2020, Messer reported 44 industrial accidents with loss of working hours – a figure that remained unchanged from 2019. The rate of loss of employee working time per million hours worked (accident frequency rate)

likewise remained unchanged at 2.0. The number of working days lost per million hours worked (industrial accident severity rate) rose from 45.6 in 2019 to 56.3 in 2020. We recorded 83 reportable industrial accidents – 14 fewer than in the previous year; the frequency rate of reportable industrial accidents per million hours worked also decreased over the course of the year, from 4.4 to 3.7. As in 2019, Messer's workforce suffered no fatalities last year.

### **International Safety Week 2020**

For a full week in September 2020, a worldwide safety week was held at all Messer locations to raise the employees' awareness of operational discipline under pandemic conditions. For Messer, that means the UV-C disinfection of gas cylinders previously used in hospital service, for example, as well as continued strict compliance with hygiene standards, especially with

regard to the filling of cylinders with urgently needed medical gases. Messer's production plants operate in non-contact multi-shift schedules. To comply with these and other pandemic rules, Safety Week conducted local campaigns encouraging our 11,000 employees to act responsibly. The events were held in open air or as webinars.



## Safety awards

The “Compressed Gas Association” (CGA), a North American industrial gases association, presented its “Gold 2-Star Safe Facility Award 2020” to **Messer Canada** for its plant in Brampton, Ontario. The award recognizes 1,250,000 hours worked – 25 years – without a lost-time accident. **Messer North America’s** sites in Birmingham, Alabama, and Hopewell, Virginia, were also recognized: for 1,000,000 hours worked – 20 years – without a lost-time accident, both sites earned a “Gold 1-Star Award 2020.” Thirty-one other Messer plants in North America also received silver and gold awards for occupational safety.

On October 8, 2020, **Messer Ibérica** was honored for the seventh consecutive time with the safety award of the Spanish chemical industry employers’ association (FEIQUE) for another accident-free year. Messer Ibérica has reported zero industrial accidents for more than 18 years now at the Vila-seca air separation unit, more than 11 years at the El Morell site, and more than 10 years at the Alicante filling plant.

## Safety of our customers

The worldwide coronavirus pandemic has underscored the importance of regularly disinfecting hands and surfaces and complying with hygiene measures. In 2020, Messer worked with Heraeus Noblelight to develop a mobile UV-C disinfection system for decontaminating surfaces and shapes of all kinds. To make it as versatile as possible to use, the system is designed as a hand-held device. The system from Heraeus’ Soluva product range can be used to sterilize not only production machinery and vehicles, but also public buildings and offices, as well as numerous fabrics, motor vehicle interiors, and control panels, along with many other surfaces.

In early November 2020, the European Industrial Gases Association (EIGA) presented four safety awards to Messer for exemplary work safety:

**Messer Hungarogáz** (Hungary) earned a “Gold Star Safety Award 2020” for having gone 20 years without an industrial accident at its production site in Kazincbarcika.

**Messer Industriegase** (Germany) was presented a silver EIGA safety award for having operated accident-free for 10 years at the site of its air separation unit in Salzgitter.

**MG Odra Gas** (Czech Republic) was proud to receive a “Silver Safety Award” for having worked 500,000 hours without an industrial accident.

**Messer Romania Gaz** (Romania) received a bronze safety award for five accident-free years at the Mintia site.

Messer itself is relying on the mobile UV-C disinfection system throughout Europe to disinfect gas cylinders for medical oxygen when hospitals or patients return them for refilling. Disinfection with UV-C light offers many advantages over the chemical approach: it considerably reduces the amount of effort required; it minimizes risks for operators, consumers and the environment; and it lowers the risk of material damage to pressure tanks and their accessories.

## Safety of our logistics and vehicles

The road transport of gases carries many risks. For that reason, the Messer Group signed the Road Safety Charter and has committed itself to placing special focus on transportation safety. In addition to the statutory regulations governing the operation of a fleet of vehicles, Messer's own transportation safety concept has proven effective.

Logistics develops safety measures at the national and international level and logistics and safety personnel continuously exchange information about their experience relative to improving our safety performance.

For the most part, Messer employs external carriers to transport our gases. Legally required driver training courses fall under the responsibility of the carriers and are supplemented with a driver training program developed by Messer Corporate Logistics.

An on-board computer system installed in the trucks since 2019 records safety-related driving data that contribute to specifically targeted instruction. The system evaluates the vehicle's driving data and the sensors of the system, displaying warnings when necessary to encourage more defensive driving while out on the road. That makes transport operations safer and – through lower fuel consumption – also more eco-friendly.

At Messer, the number of preventable accidents worldwide during the transport of our cylinder gases in 2020 was 64 – that means 3.05 accidents per million kilometers driven (4.91 accidents/million miles driven). The number of preventable accidents during the transport of liquefied gases was 194; accordingly, the frequency rate per million kilometers driven during the same period was 0.89 (1.43 accidents/million miles driven).

This relatively high number is attributable to the fact that some of Messer's statistics also include reported near misses, which constitute a non-negligible share of the incidents. Part of Messer's safety strategy involves learning not only from accidents, but also from unsafe behavior. Logistics encourages the proactive reporting of these near misses.

Appropriate supplier management and the previously mentioned driver training courses – including ones supported by the new on-board computing system – will help to reduce the number of incidents further. In addition, all drivers receive a driver's manual specific to their work (bulk, cylinders or service vehicles). This ensures that all important information relating to their job is readily accessible.



# Healthcare

## Messer is a partner in the medical and pharmaceutical sector

Messer is active in the medical business in over 20 countries and provides services ranging from consultation on the delivery of medicinal gases or gases as medical devices through to the planning, installation and maintenance of supply systems – a complete service package from a single source. Medical accessories and consumables round out the offering.

As a company that is also active in the pharmaceutical sector, Messer complies with all national, European and international regulatory requirements. For gases as medicinal products,

this specifically includes the requirements of (European) Good Manufacturing Practice (EU-GMP) and the specifications of the European Pharmacopoeia. Our gases as medical devices comply with the Medical Device Regulation (EU 2017/745), the previously applicable Medical Device Directives, and the corresponding national laws.

Internal audits, a standardized pharmacovigilance system, and validated procedures and computer systems ensure our product and supply quality.

### Supplying medical gases for people suffering from Covid-19

The supply of medical oxygen to hospitals for ventilation purposes for people suffering from Covid-19 was and is especially important:

Supply to the patients during the crisis can be assured by significantly increasing production capacities, installing additional tanks and evaporators at our customers' facilities, and providing additional transport equipment. These measures are being implemented while applying additional protection systems for our employees.

With a new filling center in Saint-Georges d'Espéranche near Lyon, Messer in France was able to satisfy the SARS-CoV-2 pandemic-driven increase in demand for medical oxygen in cylinders and bundles. The successful start-up of the filling center in early-March 2020 followed several months of preparation along with obtaining the necessary approval from the French regulatory agency for medical devices and health products.

Spain is one of the countries most affected by the SARS-CoV-2 pandemic. Like many of our neighboring chemical companies in the Tarragona chemical complex, Messer in Spain reacted rapidly and increased our production of urgently needed products. In the first weeks of the emergency, we doubled our production of medical oxygen. We delivered oxygen to 170 medical centers in all – 32 of which are hospitals with liquid supply – but also patient transport services and home care providers. We signed a new agreement with a home care provider to supply nursing homes in the Barcelona area. Our engineering and installation specialists are working intensively to expand oxygen supply to

hospitals and nursing homes and to install gas supply systems in field hospitals.

Messer in Hungary supplies medical oxygen to some 140 medical facilities nationwide, nine of which are hospitals that primarily treat people suffering from Covid-19. Our teams in Filling regularly and systematically sterilize our medical gas cylinders along with the filling stations. And they carry out their work under extremely strict precautionary measures.

Messer in Serbia has been able to meet the increased demand of hospitals and clinics: as an integral part of the equipment for stockpiling and supplying medical oxygen, we installed additional tanks in the Clinical Center of Serbia, in Karaburma Military Medical Center in Belgrade, and in the military hospital in Niš. At Zemun Clinical Center, we expanded supply capacities by also adapting the central pipeline supply and three substations to the increased demand for medical oxygen. In addition, transportable cryogenic tanks were installed in the Clinical Center in Kragujevac, in Zvezdara Clinical Hospital Center, in the Infectious Disease Clinic in Belgrade, in "Dragiša Mišović" Clinical Hospital Center – the maternity and children's hospital in Belgrade – and in Karaburma 2 Military Medical Center.

New York was affected by the coronavirus pandemic like no other metropolitan area in the USA. Due to the tremendous demand for medical oxygen, we increased production in our



own plants. Newly configured truck routes ensured continuous delivery. Our teams monitored the systems every day, reacted rapidly, and collaborated closely with every hospital. This also included the solicitation of new demand quantities along with information on how to recognize when our bulk equipment might need maintenance.

### **National Nurses Week in Colombia**

During “National Nurses Week,” Messer honored the health-care personnel who work for the company’s own REMEO Medical Services. The REMEO program of Messer in Colombia offers life-saving medical oxygen and home care for people on artificial ventilation. Messer also remains firmly committed to supplying products to people suffering from Covid-19 – both in REMEO centers and in hospitals throughout Colombia that depend on Messer’s medical gases and services.

In Colombia, Messer is the market leader for stationary and home care, supplies hospitals with medicinal gases, and helps them develop their gas supply systems. Although the systems generally run only as far as the hospital rooms or operating rooms, in Colombia the supply is designed for the patients themselves. Along with the permanently installed infrastructure,

The “Expofutura” convention center in Pereira, Colombia, was temporarily converted to a field hospital to treat people suffering from Covid-19. This added 45 patient beds to the region’s capacity. Messer in Colombia also installed a piping network to supply medical oxygen.

Messer also supplies inhalers and ventilators as well as other accessories needed for the supply of medicinal gases or breathing air to individual patients. In so doing, Messer supports more than 36,000 people at home, who rely on supplemental oxygen to breathe. In addition to gas in cylinders, most of them receive oxygen concentrators that filter oxygen from the surrounding air. Within the framework of its REMEO program, Messer also maintains six clinics of its own for some 350 people whose severe chronic respiratory diseases necessitate continuous care. The REMEO clinics also have sleep laboratories for treating nocturnal respiratory disorders. In all, Messer employs some 1,200 nurses and caregivers in Colombia, who are specially trained and can develop their expertise considerably through their work with REMEO.





**Environmental and  
Climate Protection**

## Greenhouse gas emissions

By the intrinsic nature of the process, the decomposition of ambient air in our air separation units produces no toxic or environmentally harmful emissions. Even if a shutdown or a power outage occurs, only natural components of the surrounding air are emitted. When supplying our gases, only the compressed gases delivered in steel cylinders in gaseous form are considered to be packaged products. As a general rule, our customers lease steel gas cylinders from us and return the empty cylinders to us after use. After subsequent cleaning and inspection, they are 100 percent reusable, remaining in circulation for at least 30 years.

We express our CO<sub>2</sub> footprint – in other words, the sum of all greenhouse gases emitted directly and indirectly by our production facilities and logistics – in CO<sub>2</sub> equivalents (CO<sub>2</sub>e).

### Scope 1:

Scope 1 includes direct emissions generated by our production facilities, especially in connection with the manufacture of hydrogen, carbon dioxide and nitrous oxide. Other direct emissions are generated by the combustion of fuel in logistics. In 2020, Scope 1 for Messer worldwide was 220,600 metric tons of CO<sub>2</sub>e. In 2019, the comparable value was 78,300 metric tons of CO<sub>2</sub>e. There are two explanations for that significant change: firstly, the 2020 calculation also included direct emissions from North and South America for the first time. And secondly, a correction was made to reassign the scope of the bulk products used in our filling plants. Up till 2019, they had been assigned to Scope 1, and starting from 2020 they will be included under Scope 2. This shifts more than 90 percent of the associated greenhouse gas emissions, which corresponds to about 25,000 metric tons of CO<sub>2</sub>e.

In 2020, the bulk and cylinder fleet of Messer Group including Western Europe consumed 29.95 million liters of diesel fuel.

In the 2020 financial year, that value was a combined 4.78 million metric tons of CO<sub>2</sub>e – and, therefore, 40,000 metric tons below the previous year's figure. Since 2018, the quantity of emissions has been calculated separately for each production unit. Our calculation of greenhouse gases is broken down into three categories according to the GHG (Greenhouse Gas) Protocol: direct emissions (Scope 1), indirect emissions from procured energy (Scope 2), and other direct emissions in the upstream and downstream supply chain (Scope 3).

We measure CO<sub>2</sub> emissions intensity as coefficient CO<sub>2</sub>e per euro of sales. That value was a combined 1.53 CO<sub>2</sub>e for Messer in 2020, and, therefore, slightly below the combined value of 1.55 CO<sub>2</sub>e measured for 2019.

In 2019, that figure was 32.3 million liters. Our fleet traveled a total of 96.98 million kilometers in 2020; that figure was 106.2 million kilometers in 2019.

The average rate of diesel fuel consumption was essentially unchanged: it was 0.310 liters per kilometer in 2019, and 0.309 liters per kilometer traveled, was the average consumption calculated in 2020.

We express the trend in distance traveled per metric ton (payload) of liquefied industrial gases or cylinder gases with an index value of 101.9, whereby the index was 100 in 2019. At Messer Group including Western European subsidiaries, the distance traveled in 2019 was 21.6 kilometers/metric ton; in 2020, that figure averaged 22.3 kilometers/metric ton. The slight degradation in this parameter resulted from, among other factors, the fact that the seamless supply of medical oxygen during the coronavirus crisis required longer routes.

Messer Americas documented this parameter for the first time in 2020, posting a value of 24.2 kilometers/metric ton.



Logistics implemented various efficiency improvement measures. Examples include:

- the introduction of an onboard computer system for trucks to promote more defensive and therefore more fuel-efficient driving
- route planning and KPI analysis to reduce the number of kilometers driven
- supplier audits concentrating not only on technical aspects, but also on sustainability and environmental issues and requiring the suppliers' adherence to the ten Principles of the UN Global Compact

## Scope 2:

Indirect CO<sub>2</sub> emissions under Scope 2 relate to the process of producing the electricity purchased throughout the Group and totaled 4.51 million metric tons in 2020, 1.64 million metric tons of which were allocated to Messer in North and South America. The decrease versus the previous year's value of 4.57 million metric tons, which did not yet include the quantities from Messer in North and South America, is primarily attributable to the lower emissions factor: as long as the global trend toward producing more green electricity continues, our indirect CO<sub>2</sub> emissions under Scope 2 – which make up more than 90 percent of our total emissions – will follow that trend, till the long-term goal of climate neutrality has been achieved.

With regard to the air separation units that we develop and build, their energy-efficient design and the cost-effective procurement of energy used to operate them play major roles.

Our goal is to continuously reduce the specific energy consumption of our air separation units. That goal will be achieved through better utilization of the existing production units as well as continuous investment and specifically targeted projects that sustainably increase the energy efficiency of the units. This task falls under the purview of the Global Energy Officer (GEO), which has been a permanent function within the Messer organization since 2014.

Energy efficiency in production is expressed in the energy coefficient. It indicates how much electrical power a production unit consumed per metric ton of product it produced as compared with a theoretical "reference unit" (energy coefficient = 100). In the 2020 financial year, this value averaged 99.9 worldwide

In Croatia, the Czech Republic, Serbia and China, Messer produces nitrous oxide in N<sub>2</sub>O plants. That gas is used in medical applications and in the electronics and food industries. In Switzerland and China, Messer operates a total of six company-owned hydrogen plants. Three other hydrogen units located on our customers' premises in Austria and Hungary (on-site units) are not included in the calculation of our own CO<sub>2</sub> footprint. In its gaseous state, hydrogen is used in many industrial sectors, including as a food additive in hydrogenation or fat-hardening, in heat treatment processes, as an energy source, or even as an emissions-free fuel.

at Messer. In the previous year, the figure was 98.4, but did not yet include the activities of Messer in North and South America. For this reason, no direct comparison can be made between the energy coefficients of the 2020 and 2019 financial years.

The emissions factor was about 4.8 percent lower than the previous year. Our absolute, worldwide CO<sub>2</sub>e footprint was about 1 percent smaller in 2020, despite the fact that more electrical power was consumed overall for quantity of product manufactured. We achieved this by improving the electrical power emissions factor of our production units: the make-up of the applied energy mix featured a higher share of "green energy" than in the previous year.

In 2020, our production units consumed 10.6 TWh of electricity worldwide, which was 0.4 TWh more than in 2019. This change was attributable to a significant increase in electrical demand in Asia (+15 percent) versus 2019, while demand in Europe and the Americas fell (-6.8 and -0.9 percent, respectively). The share of intentionally purchased green electricity, i.e. electrical power beyond the average share of power from renewable energies in the grid, totaled 65 GWh.

To optimize our electricity procurement, we use continuous tenders and long-term framework agreements and continuously monitor the futures and spot markets. We have a centralized team that supports and advises our subsidiaries when they purchase electrical power. It also regularly reviews electricity costs and the use of renewable energies in the context of a comparative analysis.

Despite efficiency improvements, the Group's indirect CO<sub>2</sub> emissions (Scope 2) increased as a result of sales growth due to new air separation units – including the North and South American units that have now been included in the calculation for the first time – as well as due to higher utilization of existing units. Through reduction of specific electrical energy consumption, which is documented by energy coefficients, and minimization of the emissions factor relative to the purchased electricity mix, however, the absolute emissions increase remains disproportionately low.

### Scope 3:

The emissions covered under Scope 3 are indirect emissions unrelated to the purchase of electrical power. Examples include the purchase of competitors' products, business travel, and employees' commute to their place of work. The total CO<sub>2</sub> equivalence value for greenhouse gas emissions under Scope 3 was 43,000 metric tons. That represents a significant reduction versus the comparable figure from 2019, which was 175,000 metric tons of CO<sub>2</sub>e. Moreover, the value for 2020 also includes

The efficiency improvement measures in Production included:

- replacement of obsolete, inefficient equipment by modern technology (e.g. a new air compressor in the air separation unit in Smederevo, Serbia)
- installation of on-site units to eliminate the need for liquefied gas deliveries by truck (e.g. air separation unit in Speyer, Germany; N<sub>2</sub> generator at Wieland, Austria)
- implementation of Aspen DMC advanced process control software in seven air separation units

the figures from Messer in North and South America, which was not the case in 2019. This trend is primarily attributable to the correct allocation of product swaps in 2020: Messer sells bulk products from its own sources to competitors in exchange for product from competitors' sources. This can significantly reduce the number of kilometers driven along with the resulting emissions.



## Water consumption

Group-wide, our air separation units consumed 16.6 million cubic meters of water in 2020. That value was 700,000 cubic meters lower than in the 2019 financial year. Most of the water we use cools the compressors in our air separation units.

Our main manufacturing processes – air separation, CO<sub>2</sub> purification and liquefaction – need no water for process control. Rather, they generate large quantities of heat – mainly by the compression of gases – which are usually removed by a cooling water system.

Most units have an open cooling circuit: the cooling water circulates in a loop, absorbing heat from the respective sources and discharging it to the atmosphere in an open cooling tower. In an open cooling tower, part of the circulating water evaporates and another part is removed to prevent insoluble components from thickening. Fresh water must be fed back into the system to replace the water that is evaporated and/or removed. This results in the only direct water consumption of our manufacturing processes. Directly dependent on a unit's power consumption, the quantity of water added is around two to three cubic meters per hour per megawatt of electrical power.

## Energy management system certifications

Our commitment to environmental protection is also reflected by our quality management system, which regulates our operations the world over. We are certified according to ISO 14001 and RCMS in 59 consolidated companies. ISO 14001 is an internationally recognized standard developed by the International

Organization for Standardization (ISO). It defines requirements designed to help organizations establish, implement, maintain and continuously improve their environmental management systems. RCMS certification serves the comparable purpose and function for our American production sites.

## Commitment for a clean environment

Our goal is not only to minimize our own CO<sub>2</sub> footprint, but also to help our customers reduce their emissions as well. Through the impact of our gas applications, we achieve this with an efficient supply of gases – via on-site units, for example, or the use of green hydrogen.

Our customers use our Gases for Life in industrial processes to increase the efficiency, quality, capacity and eco-friendliness of their activities, and/or to reduce the associated emissions and costs. To maximize those effects, we work closely together with our customers. We supply application engineering equipment and expertise, help design and optimize processes, and actively support process development in the service of our customers.

The number of new bulk agreements signed by Messer Group including the Western European subsidiaries remained close to the level of the previous year: in the 2020 financial year, 29.7 percent of new contracts were signed with explicitly positive overall effect on the environment: in the 2019 financial year that figure was 26 percent.

The increased number of new contracts based on applications with positive effects on the environment include, among other things:

- an increase in the number of oxygen applications in China
- systematic trials with and implementation of cryocondensation units
- advanced development of oxyfuel and hydrogen-oxygen combustion technology

The installation of on-site units for the local production of industrial gases and the resulting replacement of bulk deliveries reduced greenhouse gas emissions by about 3,200 metric tons of CO<sub>2</sub>e in the 2020 financial year.

In August 2020, Messer Group joined the European Clean Hydrogen Alliance to share with partner firms throughout Europe our extensive expertise in industrial gases relative to the efficient and effective use of green hydrogen. Since 2020, Messer has also been a partner in the project to expand EnBW Group's power-to-gas plant in Grenzach-Wyhlen in the German state of Baden-Württemberg. The electrolysis plant operated there will be expanded to a total electrical power of six megawatts by 2023. We are responsible for marketing the green hydrogen in the surrounding region, and this gives us an opportunity to help decarbonize the regional transportation network and the regional industry.

### International: Communication with Eco effect

Since 2020, our industrial gases magazine, "Gases for Life," has been distributed exclusively online and is no longer printed. For each issue, that saves about a ton of paper as well as ink and also electrical power for operating the printing presses. It also completely eliminates the greenhouse gas emissions that would have been generated in connection with the international

In the USA, Messer Industries has been successfully marketing hydrogen for mobility applications for 15 years now. Twelve locations are currently supplied, including the BMW plant in Spartanburg, South Carolina – one of the largest facilities in the world where fork lift trucks are deployed. Another focus area is the bus sector: new legislation in California (CARB/Innovative Clean Transit Regulation) and Europe (Directive 2009/33/EC on the promotion of clean and energy-efficient road transport vehicles) oblige bus companies to gradually convert their fleets to emission-free drives by 2030. In 2020, Messer Industries set a new world record for refueling fuel cell-powered buses in series. Messer is actively involved in supplying fuel for fuel cell-powered buses in China as well: we resupply hydrogen refueling stations for them in Zhangjiagang and Chengdu.

distribution of the magazines. In 2020, the Group's annual report – with the exception of a few printed deposit copies – was also published in digital form only. Moreover, the August 2020 relaunch of Messer's internet site made it possible to reduce electrical power consumption – through the reduced, efficient and bundled storage of data on fewer servers, for example.

### Germany: Messer pitches in with RhineCleanUp 2020

Messer supported the RhineCleanUp again in 2020 and encouraged our employees to participate in this voluntary activity that removes thoughtlessly discarded litter from the banks of the Rhine. In 2018, together with the City of Krefeld, we organized

this activity for the first time. On September 12, 2020, many employees and their families answered our call once again for active environmental protection.



### **Germany: Healthy company vehicle**

Bike riding is healthy and actively contributes to environmental protection. That's why, since September 2020, Messer has made it possible for its employees in Germany to lease a

company bike for a period of three years. The leased bikes or e-bikes can be ridden to work but are also available for personal use.

### **Spain: Messer supports green hydrogen initiatives**

In 2020, Messer in Spain joined the Spanish Hydrogen Association and the Green Hydrogen Platform Southern Catalonia. The latter was established in September 2020 at the initiative

of research centers, companies and institutional bodies. Its goal is to promote the development of projects along the green hydrogen value chain.

### **Switzerland: In-house energy production by water turbine**

Messer in Switzerland has been producing its own electricity via a water turbine since 2020. It has a capacity of 250 kW, resulting in a maximum electrical power output of 235 kW.

Unneeded power is fed into the power grid, especially on weekends.

### **Switzerland: Volunteering for climate protection and energy efficiency**

In 2020, Messer in Switzerland participated in the program of the Energy Agency of the Swiss Private Sector (EnAW). With this voluntary participation, the company acknowledged its commitment to sustainable climate protection, active reduction

of CO<sub>2</sub> emissions, and the optimization of its energy efficiency. The associated target agreement is recognized by the federal government, the cantons and partner businesses.

### **Slovakia: Low-emission and safe transport by truck**

Since early 2020, Messer products in Slovakia are transported by a new forwarding company whose entire fleet of vehicles meets the strict EURO 6 European emission standards. At the

same time, Messer Group is equipping these vehicles with a safety control system that monitors driving style, thereby, promoting transport safety.

### **USA: Support for the 50th edition of Earth Day**

April 22, 2020, marked the 50th anniversary of Earth Day, which is dedicated to strengthening our appreciation for the environment. Messer Americas took this opportunity to raise employees' awareness and reinforce the importance of eco-friendly action – both in the workplace and in the private

sphere. Customers were reminded that, within the framework of environmental protection compliance, everything will be done to support the worldwide efforts to minimize climate change.



# Environment and Energy Awards

## Switzerland: Messer among the finalists for the 2020 Green Award

In collaboration with the Swiss Federal Institute of Technology in Lausanne, Messer in Switzerland was one of three finalists for the 2020 Green Awards in the “Innovation” category. This success was thanks to the joint development of a hydrogen refueling station that can be installed and operated anywhere.

This could soon solve the current infrastructure problem. Over a million spectators watched the award ceremony via live stream. It was held in September 2020 in the context of the international Greentech Festival for green technologies and sustainable lifestyle in Berlin.

## Switzerland: Environmental certificate granted

In 2020, Messer in Switzerland received an Environment Certificate from the association PET-Recycling Switzerland (PRS). In Lenzburg, the Messer team had collected a total of

267 kilograms of PET beverage bottles for recycling. This saved about 801 kilograms of greenhouse gases.





**Customer Loyalty through  
Innovation**

## Sustainable technologies

One of our goals is to use our gases and our applications expertise to make our customers' products and processes as eco-friendly as possible. There are many different ways to achieve this: in various applications, gases can release chemicals that endanger the environment. Our bulk, pipeline and cylinder gases also make important contributions toward

reducing greenhouse gas emissions, preventing waste and scrap, or saving energy. And the environment is not the only winner: our gas applications are also able to make processes safer, less expensive, more efficient and/or improve their quality.

## Concrete process improvements at our customers

### International: Audit, know-how, efficiency

At the request of a food manufacturer that was dissatisfied with the cooling performance of its pelletizer, Messer specialists conducted an audit in 2020. The intensive investigation of the nitrogen lines revealed that some sections of the pipeline were not insulated and that the vacuum insulation was damaged at other points. Both problems were eliminated and the gas

supply system was also equipped with a subcooler. It ensures that the nitrogen remains in a liquid state on its way to the pelletizer. Successes of the measures: up to 20 percent lower nitrogen consumption, a stabilized production process, and a significant reduction in energy consumption.

### International: Superconductivity for large consumers

Industrial power lines must provide a great deal of electrical power, however, part of which is lost due to electrical resistance. Superconductors that conduct electricity without losses solve this problem. The prerequisite for this is a very low operating temperature. In the context of the DEMO200 project, a superconducting busbar system is being developed for series production. For DEMO200's pilot project, which started in

2020, Messer developed a new technical approach for cooling the busbar: to reach the required operating temperature of -206 degrees Celsius, the -196 degree liquid nitrogen is further "subcooled." For this purpose, it is fed into a vacuum-insulated tank where expansion under negative pressure cools it down to -209 degrees Celsius.

### Germany: Fuel from sewage sludge

Together with twelve other partners from five European countries, the Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT is carrying out the EU project "TO-SYN-FUEL." It is designed to show how thermo catalytic reforming (TCR) can be used to convert organic waste – in this case, sewage sludge – into biofuels, green hydrogen and

biochar. In 2020, a demonstration unit went into operation. It converts 500 kilograms per hour of dried sewage sludge into about 50 liters of standard-grade gasoline and diesel. Messer in Germany supported the project with regard to the technical layout along with the specification and design of the hydrogen tank.



### Germany: Continuity breeds success

For ten years now, Messer and Spreelast have been working together intensively – originally on the development of a process for pulverizing rubber granulate. Along with the required hardware for testing, Messer also supplied the nitrogen used

in the pulverization process. The continuous development of the process helped Spreelast further increase its production capacities.

### Spain: Energy-efficient processes and sustainable customer supply

Messer in Spain developed and operates the most important pipeline system for industrial gases on the Iberian Peninsula. Located at the Tarragona chemical complex, it ensures the sustainable, flexible and reliable supply of nitrogen and oxygen to major customers of the chemical and petrochemical industry.

The plants connected to this system operate very energy-efficiently. The air separation units of Messer in Spain have an energy management system that has been certified according to ISO 50001 since 2012. Messer was one of the first companies in Catalonia to obtain that certification.

### Austria: Relaxed welding

To avoid hardening and cracks and ensure optimal bonds between weld seams and base material when welding large forged parts, it is important to keep temperature differences under control. That's why the workpieces are preheated before welding. To shorten the preheating and make it more efficient, specialists from Messer and Messer Cutting Systems conducted a series of tests on the ovens of the Austrian manufacturer

Potoschnigg. This led to an optimized burner constellation. The ovens are also no longer fired by propane with compressed air, but rather with a propane-oxygen mixture only. Since the oven conversion in February 2020, the resulting 30 to 45-minute shorter heat-up time has enabled significantly more efficient use of the units.

### Slovenia: CO<sub>2</sub> replaces sulfuric acid

The textile manufacturer Tekstina has been procuring carbon dioxide from Messer to neutralize its wastewater since 2020. As part of its manufacturing operations, the company mercerizes cotton fabrics with a caustic soda solution. This causes the fibers to swell and gives them a silk-like, wash-resistant sheen,

while also making them stronger and more shrink-resistant. The wastewater from this process is alkaline and used to be neutralized with sulfuric acid. The use of CO<sub>2</sub> now makes this stage of the process more efficient and environmentally friendly.

### Poland: Eco-friendlier wastewater treatment

Zakłady Górniczo-Hutnicze "Bolesław" S.A (ZGH) produces electrolytic zinc and various zinc alloys. The wastewater streams that the operation generates, which vary in quality over an extremely wide range, must be collected and neutralized. Although the iron sulfate previously used to treat them did achieve the primary purpose of pH adjustment, it was highly

objectionable from an environmental engineering perspective. In 2020, based on a comprehensive test series, Messer was able to convince ZGH of the advantages of neutralization with carbon dioxide. The chemicals typically used in the industry are no longer needed.

### USA: Pulp and paper industry reduces water consumption

To meet the US Environmental Protection Agency's wastewater discharge requirements and wastewater guidelines, Messer offers NEUTRA water treatment solutions to its customers from the pulp and paper industry. A large quantity of water is used to wash the pulp. Carbon dioxide – supplied by NEUTRA injectors and control systems – forms carbonic acid dissolved in a liquid,

which can be handled with greater safety and reliability and can be specifically used to lower the pH of the pulp. This reduces the fiber length of the pulp as well as the quantity of water required and requires fewer chemicals. The customer also benefits from reduced contaminants and wastewater quantity.

### USA: Cryogenic processes with fewer climate-damaging chemicals

The CRYOCONTROL Fluid Temperature Control (FTC) system for chemical processing operations and oil and gas processing operations uses the cooling effect of liquid nitrogen to condense waste stream components (volatile organic compounds, for example) into separate streams. The components can be collected in this way for reuse or to reduce disposal costs.

Cryogenic nitrogen enables the users to reach lower temperatures, in order to cost-effectively capture a greater variety of organic compounds. Moreover, the CRYOCONTROL FTC system needs no secondary heat transfer media, such as CFCs or ammonia, which are used in mechanical cooling systems.

### USA: OXIBOOST reduces emissions and costs in cement production

With the start of infrastructure projects in the USA, the demand for cement is also increasing. With Messer's OXIBOOST lances for oxygen enrichment of air burners in a cement kiln, cement manufacturers can use alternative fuels (bio-based fuels) in place of oil-based fuels. Combustion with oxygen produces a higher flame temperature than combustion with air. That higher temperature makes it possible to supply more combustion heat to the cement production than is discharged from the chimney

of the cement kiln, which in turn raises the overall efficiency of the operation. This process increases the efficiency of carbon fuel utilization and helps cement manufacturers meet or exceed the Low Carbon Fuel Standards (LCFS) in states such as California. The companies that use it benefit from reduced CO<sub>2</sub> emissions and lower fuel costs and can collect carbon credits or avoid new carbon taxes.

### China: Eco-friendly CO<sub>2</sub> neutralization in textile dyeing

To adjust the pH of the fabric surface in an environmentally sound way, Messer implemented CO<sub>2</sub> neutralization in the textile dyeing process at Mizuda. The process uses carbon dioxide in lieu of the previously used acetic acid, thereby, offering several benefits, including: good neutralization effect; no corrosion of the dyeing machinery; better neutralization stability

and, therefore, improved product quality; lower operating costs; and significantly reduced water consumption. In view of the good results, all seven dyeing lines at Mizuda were converted. Four other Chinese textile printing and textile dyeing companies have also successfully implemented this application, which we continuously support.



### Thailand: Shrimps grow better with oxygen

To improve the water quality and increase the yield of its shrimp farming operations, Charoen Pokphand Group uses liquid oxygen from Messer. The oxygen injection process was tailored to the customer's needs and initially installed at two locations in 2020. In the future, it will be implemented at all of

their shrimp farms in southern Thailand. The animals benefit from oxygen injection when they spawn and hatch. In addition, the gas is used when transporting the live shrimp in tanks, where it replaces air injection from compressors.

## Satisfaction of our customers

Messer sees customer satisfaction as an extremely important metric of success. Accordingly, we feel that it is only natural that we continuously measure our customers' satisfaction and solicit their feedback concerning specific needs and suggestions, so we can then implement that feedback in the form of improvements in our products, processes and services. In this way, we actively help to improve our customers' satisfaction and performance – while, thereby, also reinforcing customer loyalty.

For example, the following improvement measures were implemented after analysis of our customers' needs and wishes:

- incorporation of QR codes on cylinder labels in Spain for easier access to material safety data sheets
- automated confirmation of receipt of order from SAP in Hungary
- qualification program for new employees in Switzerland
- facilitated online ordering system for gases and hardware through the creation of webshops in several countries
- digitalization and electronic provision of quality certificates

### Customer satisfaction surveys

We measure the satisfaction of our customers through systematic surveys and incorporate the results into our management processes. With the Net Promoter Score (NPS), we have established an additional indicator for our customer satisfaction analyses.

The analyses conducted in 2020 indicated an average satisfaction of our customers of 90.9 percent. That represents yet another improvement over the already good result of the previous year (89.4 percent average satisfaction).

Word about customer satisfaction and good service spreads fast: to measure this property of business success, we developed the NPS. Net 53 percent of customers of Messer Group and Messer Industries in Western Europe would highly recommend Messer. A score of more than 50 percent is considered to be very positive.

Overall, customer participation in our satisfaction survey increased in 2020: while we received 607 complete responses within the Messer Group (including Western Europe) in 2019, we received 890 responses in 2020. Messer Industries (without Western Europe) counted a total of 3,037 participants in 2020.

## Messer and customer loyalty-building events

### International: Messer Innovation Forum

With its webinars, the Messer Innovation Forum has become an established continuing education vehicle for application engineering at Messer. Whereas just over 1,000 people participated in 2019, we registered more than 2,600 participants in more than 164 webinars in 2020, 26 of which were external with 430 interested parties. Topics ranged across the full spectrum, including areas such as food, metallurgy, welding

and cutting, industry and chemistry/environment. The platform was used by the national subsidiaries and also by ASCO. The first external webinars with our customers were also held. We plan to continue this success story with a new layout and new technology in the near future. Today we already know that our webinars are becoming an integral part of our team's training and promoting the acquisition of new customers.

## Communication

### International: Feedback on our magazine for industrial gases

Our digital magazine "Gases for Life" is a source of timely information for both professionally oriented target groups and people with a general interest in the world of industrial

gases. The magazine is published three times a year in English, German, Spanish and Czech. In 2020, we received a total of 2,056 responses to content presented in the magazine.



The background features several thick, flowing ribbons in shades of red and gold. The ribbons curve and overlap, creating a sense of movement and depth. The colors range from a deep, rich red to a bright, metallic gold. The overall composition is dynamic and modern.

**Commitment to Education  
and Social Justice**



Once again and especially in 2020, which was shaped by the effects of the coronavirus pandemic, we met our social responsibilities. We maintained our focus on the fight against poverty and hunger along with the pursuit of social justice, while also supporting a broad range of local institutions and initiatives. In so doing, we aligned our efforts with the needs of the countries and surroundings in which we operate.

In 2020, 153 Messer locations demonstrated their social engagement through financial and material donations, social events, or to the benefit of social organizations. In all, Messer

supported 237 activities for the common good. Due to the constraints imposed on in-person interactions, most of last year's engagements could only be made in the absence of any direct participation by our employees.

Occasionally, we report on our commitment in social media or the local press, when we can use it to promote awareness for projects, organizations or institutions, or with own initiatives. We typically demonstrate our commitment without intending to generate media interest, and report here on selected examples.

## Commitment to training, education or science

### Spain: Virtual guidance and Messer Award for students

In May 2020, we organized a virtual visit of our production site in El Morell, Spain, for more than 60 chemical engineering students and teachers at Rovira i Virgili University (URV) in Tarragona. Videos presented the separate process steps and equipment of the plant and audiovisual materials were used to provide commentary. Due to the existing restrictions, we also presented the Messer Award to URV students in a virtual

ceremony. The undergraduate students defended their projects online before a jury comprised of professors and Messer employees. Representatives of the university, the Chemical Business Association of Tarragona, and Messer participated in another virtual event during which the prize for the best project was awarded.

### Hungary: Experience instruction for the blind

As part of an initiative launched by the "Institute for the Blinds," our Messer team in Hungary participated in an interesting project: with the support of two physics teachers, interactive classes were provided for blind people. Experiments and demonstrations involving the properties of our "Gases for Life"

were presented in a way that they could be felt or heard. The sense of taste was also stimulated – by ice cream previously frozen with liquid nitrogen. Some of our employees volunteered to assist in the project.



### **Serbia: Making learning fun**

Messer in Serbia supported the “Battle for knowledge” program, with the goal of supporting developmentally disabled children. This took place at special education schools with, among other things, “Bee Bots,” which look something like bees. These small, easy to use “learning robots” were pro-

cured to make the transmittal of instructional matter more fun. They help to promote equality of opportunity for these children in national and European school competitions as well as in society in general.

## Commitment to combat poverty and fight for social justice

### **International: Donations for the people affected by typhoon “Molave” in Vietnam**

Messer organized an international drive to collect private donations from among all employees in solidarity with the employees of Messer in Dung Quat, Vietnam, and their families

who were affected by the typhoon “Molave.” In so doing, they supported the reconstruction of private homes, an infirmary and schools, and provided direct care for people in urgent need.

### **Spain: Food bank donations**

The Covid-19 pandemic, which affects the entire planet and each and every one of us, has triggered not only an unprecedented health crisis, but also an economic and social one as well. Many families depend on aid for survival. The number of requests received by the food bank (Banco de Alimentos) in

Spain, for example, has risen by 40 percent this year. In view of this situation, Messer Ibérica renewed its collaboration with Tarragona’s regional food bank. In 2020, a donation of 3,000 euros was used to invest in the purchase of food for the neediest families.

### **Spain: Support for people with cerebral palsy**

In Tarragona province, the foundation La Muntanyeta supports people with cerebral palsy in a dedicated school, a day care center and a dormitory. Its goal is to defend the rights of these people and to improve their quality of life. The foundation is currently building a new center, La Muntanyeta Bonavista, which will give disabled persons a home and provide them with room

for lifelong projects. This segment of the population suffers from tremendous need and long waiting lists. The center will provide 50 places in the day care center and dormitory rooms for 60 adults. Messer was one of the first companies to support this project. Thanks to that support, every room of the new facility will have a medical oxygen supply station.



## The foundations

On April 6, 1978, Dr. Hans Messer and his family established the private charitable foundation now known as the Dr. Hans Messer Foundation. The independent foundation is a shareholder of the Messer Group and promotes education, science and research throughout Germany.

### Dr. Hans Messer Foundation

The purpose of any foundation should be to support projects and ideas that are given no or insufficient consideration within the framework of basic state provision. The Dr. Hans Messer Foundation also pursues this idea by supporting and recognizing scientists who gain prominence through special or outstanding achievements, by awarding scholarships and prizes, and by supporting scientific and educational establishments.

The Dr. Hans Messer Foundation's activities encompass support and funding as well as operational aspects. It operates as a charitable foundation with legal capacity established under private law, making a varied and ongoing contribution to the promotion of science and research as well as school and vocational education. This work is becoming increasingly important in this day and age as the state is often unable to provide sufficient funding. In this way, thirst for education, innovation, scientific curiosity and pioneering spirit are rewarded.

The purpose of the Dr. Hans Messer Foundation is to be a driving force for education and science. According to its charter, the Dr. Hans Messer Foundation supports science and research,

In the social and health spheres, Ria Messer established a second charitable foundation – today's Ria Messer Foundation – in memory of her husband Dr. Hans Messer.

The activities of both charitable foundations are independent of those of the Messer Group.

public and vocational education, and the provision of help to students. In all, more than 20 million euros have been spent for foundation purposes to date.

The board of the Dr. Hans Messer Foundation determines the focus of the foundation's work with the aim of defining a specific direction. The focal areas can change, however, or apply for only a certain period of time. The foundation currently focuses on science and research grants primarily in STEM fields, i.e. science, technology, engineering and mathematics. The field of medicine also receives regular funding. The Dr. Hans Messer Foundation awards a number of different scholarships to students, undergraduates, doctoral candidates and professionals. In addition, special scholarship programs are also set up. In 2020, the Dr. Hans Messer Foundation donated a pipetting robot to the Institute of Medical Virology at Frankfurt University Hospital for use in SARS-CoV-2 research. It facilitates the researchers' work, for example, in the high-volume testing of several thousands of substances that may show potential antiviral activity. Moreover, the automated pipetting of thousands of samples can be completed much faster overall and with fewer errors.

## Foundation prizes of the Dr. Hans Messer Foundation

To provide specifically targeted support to young scientists and their research, the Dr. Hans Messer Foundation continuously awards foundation prizes. The Foundation Prize 2019, for example, was given to the Technical University of Darmstadt for the promotion of outstanding achievements in the areas of natural science and engineering as well as economics, social sciences and the humanities. At 50,000 euros, it carries the highest endowment of any award for young scientists at the Technical University of Darmstadt. The prize is intended to fund material and personnel resources for research projects.

In 2020, Dr. Jurij Koruza of the Faculty of Material and Geosciences received the Foundation Award granted to the Technical University of Darmstadt for his research work: "Piezopapers – porous functional materials for sustainable future technologies".

A cross-disciplinary awards committee with representation from the foundation and the university board determines the prize recipients.

## Ria Messer Foundation

The aim of the Ria Messer Foundation is to support the most vulnerable members of our society. In accordance with the charter, the foundation supports charitable projects and public welfare projects.

Even today, there are many people who are more vulnerable than others. People who are sick or need care, people who do not receive enough support in our society, but desperately need help. This is precisely where the Ria Messer Foundation seeks to provide assistance. In keeping with the times, it fulfills the binding social contract implicit in the will of the founder: helping other people.

The Ria Messer Foundation treats all people with respect and tolerance. Its activities encompass support and funding as well as operational aspects. It has been a charitable dependent foundation established under private law since it was founded. It is held in trust by the Dr. Hans Messer Foundation.

The purpose of the foundation is to provide support to specific individuals within the meaning of § 53 AO (German tax code) and to promote social welfare. This purpose shall be achieved by helping individuals who are dependent on the help of others as a result of their physical, mental or psychological condition (§ 53 No. 1 AO of the German tax code), who find themselves in need through no fault of their own, for example as a result of natural disasters, who are in need according to § 53 No. 2 Clause 3 AO of the German tax code, by providing one-off or ongoing financial support in order to remedy their need in the long term or by financially aiding the work of the leading independent welfare organizations or other tax-privileged bodies operating in the charitable sector or other tax-privileged organizations providing care and treatment to individuals suffering from serious illnesses through no fault of their own.



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## Translation

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Our commitment to climate protection also extends to this sustainability report itself: with the climate initiative of the German Printing and Media Industries Federation (bvdm), we are supporting a CO<sub>2</sub> reduction project that uses use gases generated from waste at the Santa Marta landfill in the south of Santiago de Chile to produce eco-friendly energy.

For further information about our climate protection commitment, please scan the QR code.



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 responsible forestry



