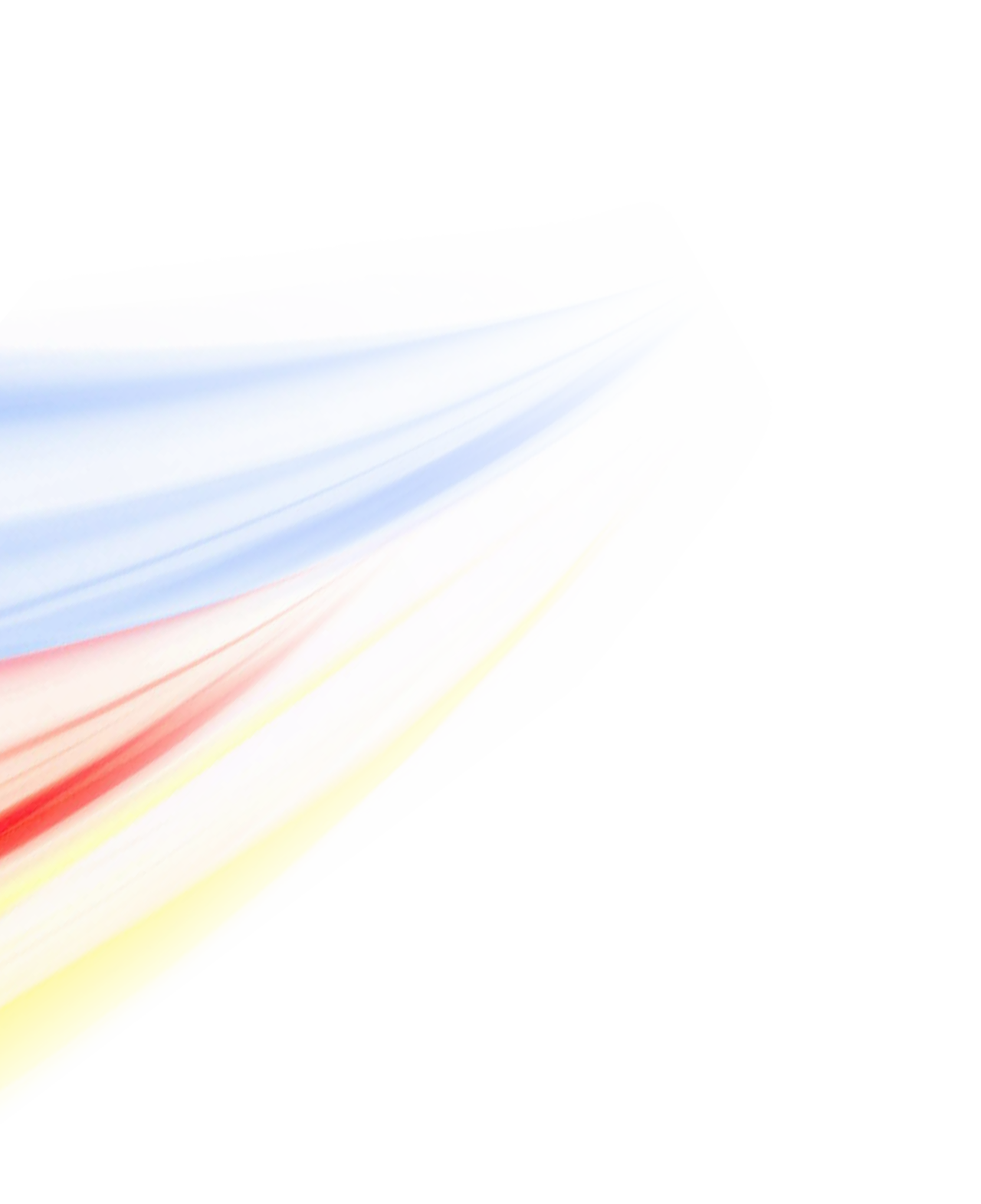


120urWay.



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Messer – Gases for Life

Messer was founded in 1898 and today is the largest family-run specialist for industrial, medical and specialty gases worldwide. Under the brand ‚Messer - Gases for Life‘ the company offers products and services in Europe, Asia and the Americas. The international activities are directed from Bad Soden near Frankfurt am Main. Stefan Messer, owner and CEO of the Messer Group GmbH, works together with the more than 11,000* employees worldwide according to defined principles: These include customer and employee orientation, responsible behaviour, corporate responsibility, excellence as well as trust and respect.

The Messer Group GmbH generated consolidated sales of 1.3 billion euros in 2018.

From acetylene to xenon, Messer has one of the most diverse product portfolios on the market – it produces industrial gases such as oxygen, nitrogen, argon, carbon dioxide, hydrogen, helium, shielding gases for welding, specialty gases, medical gases and many different gas mixtures.

Messer has state-of-the-art research and competence centres in which it develops applied technologies for the use of gases in almost every sector of industry, in food technology and environmental technology, medicine as well as research and science.

Gender-inclusive language

We want to communicate in a gender- and diversity-friendly way and make people in all their diversity visible in the German language too. We are aware that this requires all genders to be mentioned explicitly. Hitherto, in our German documents, we have always talked of male and female employees. With the official expansion of gender categories to include female, male and “diverse”, we are looking for a new form of gender-friendly communication that ensures that everyone is addressed equally and with respect. In this year’s German-language version of our annual report, we have temporarily decided to mainly use the masculine form for practical reasons.

Global Reporting Initiative

This report complies with the G4 Guidelines of the Global Reporting Initiative (GRI).

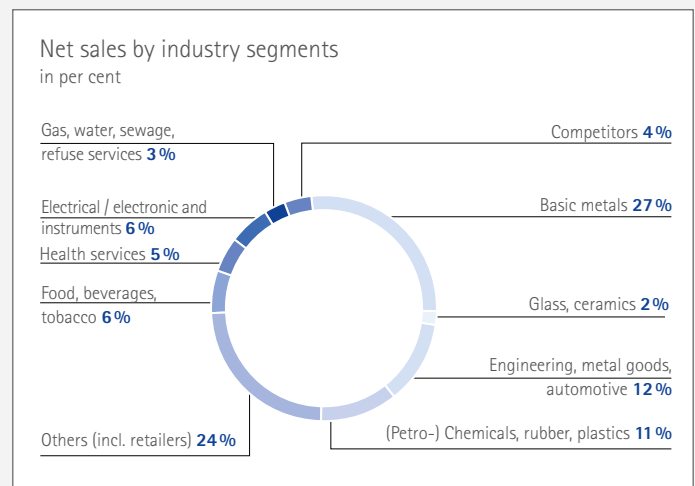
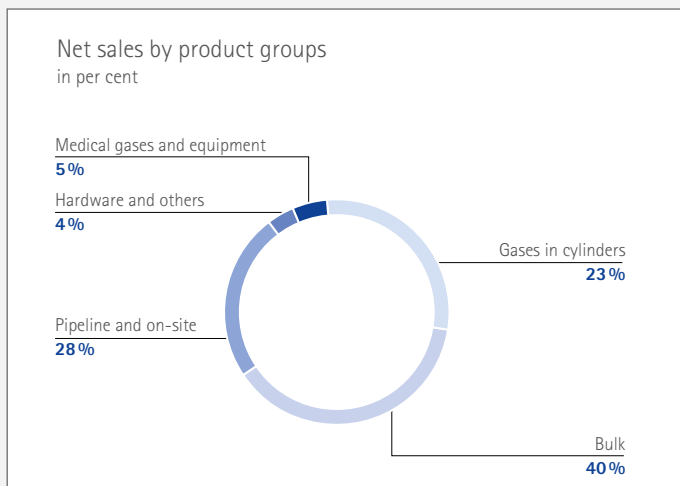
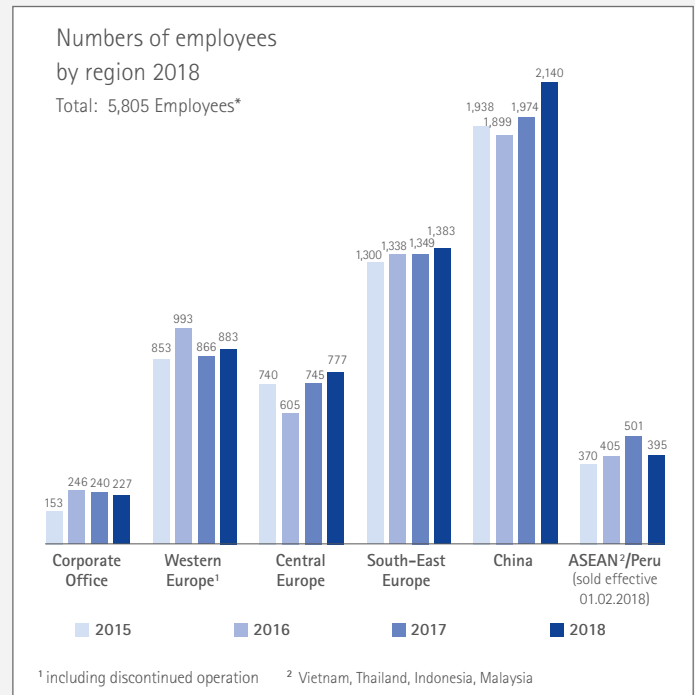
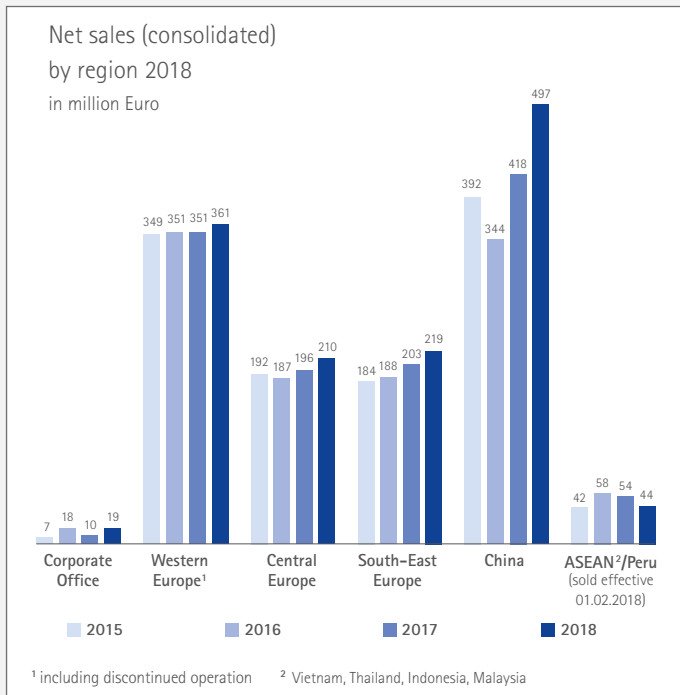
* incl. as of 01.03.2019 at equity consolidated Messer Industries GmbH

Key figures of the Messer Group GmbH at a glance

As of 31.12.2018

		2015	2016	2017	2018
Net sales	in million Euro	1,166	1,146	1,232	1,350
EBITDA	in million Euro	252	249	290	366
EBITDA margin	in per cent	22	22	24	27
Investments	in million Euro**	145	147	144	240
Employees*		5,354	5,485	5,675	5,805

* contractual employments ** incl. IFRIC4



The Mission Statement of Messer

Messer is the largest family-run industrial gas specialist and present in the relevant markets in Europe, Asia and the Americas.

We act sustainably to meet the needs of our customers in accordance with our collective responsibility for people, progress and the environment.

Our Way

In 2004 the "Dubrovnik Contract" articulated our corporate-wide mission statement including our vision, mission and values according to which Messer would henceforth operate. Today we can say: we have succeeded in shaping a living corporate culture from the words contained in that contract.

For this exceptional development we owe a debt of gratitude to our staff. Thanks to their hard work and loyalty, it was possible to unleash the power hidden behind this vision, this mission and these values. More than that, a guiding principle has emerged that can power our success far beyond business units and borders wherever they might be.

This is Messer and this is our way.

Our Vision

Messer is an important industrial gases group in its core markets of Europe, Asia and the Americas.

Messer is and will remain an independent family-run business. We think and act decisively for a long term and measure ourselves by our sustained success.

Together with our partners and associated companies in the field of wear, fusion, and cutting technologies as well as precision instrumentation we develop synergies and meet our customers' needs expertly, reliably and with a flair for innovation.

This is what makes us the first choice for our customers and employees.

Our Mission

As an owner-managed family business with a rich tradition we are focused on the future whilst taking into account the different conditions in our existing markets. We also use our experience and expertise to building up our position in new markets.

Ranging from acetylene to xenon we offer our customers a wide range of technical and medical gases and food and specialty gases. Our product range is completed by our excellent services and state-of-the-art technical plants and equipment.

In our highly modern technology centers we work together with our customers to develop application technologies for the use of gases in almost every industry, in food technology, medicine, science and research.

Our efficient and dedicated employees, our flexibility and the closeness we feel to our customers in local markets makes us their preferred partner.

Through entrepreneurial flair, farsighted thinking and the continuous improvement of our processes, we create added value for our customers and so secure our mutual success in the long term.

Solid finances and fair profits guarantee our independence and support sustainable growth.



Our "corporate tree" just keeps growing. You can see it in the lobby of our Headquarters in Bad Soden.

Our Statement

Customer orientation

We are focused on the individual requirements of our customers and help them to improve their competitiveness and their performance.

Employee orientation

We train, develop and promote motivated and efficient employees with integrity. We expect our employees to be resourceful and responsible team players.

Responsible behavior

We take our social responsibilities towards our employees and to society very seriously:

- Safety: we are committed to the safety of our staff and the safe production, handling and use of our products.
- Health: we set working standards that ensure sound health and well-being for every individual.
- Environment: as a member of the wider society, we are committed to protecting the environment.

Corporate responsibility

By responsibly managing our resources and applying the talents of our employees we are increasing the worth of our company in the long term.

Excellence

Our actions are based on technical expertise, innovation, flexibility and the ability to make quick decisions.

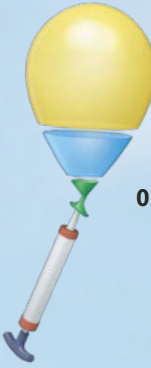
Mutual trust and respect

We believe that cooperation is based on trust, sincerity, transparency and frank communication. We respect and abide by the culture and social customs of the countries in which we work.

We make gases out of air

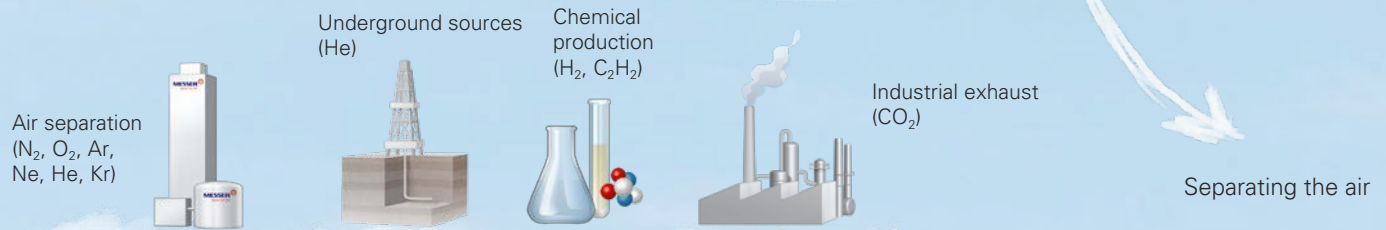
Industrial operations require oxygen, nitrogen, argon, xenon, neon and krypton, along with carbon dioxide, acetylene, hydrogen and helium, and a wide variety of gas mixtures. At Messer we call these gases **Gases for Life**. They are produced in largescale industrial plants and are just as important as water and electric power for many manufacturing processes which make everyday products.

What is air?



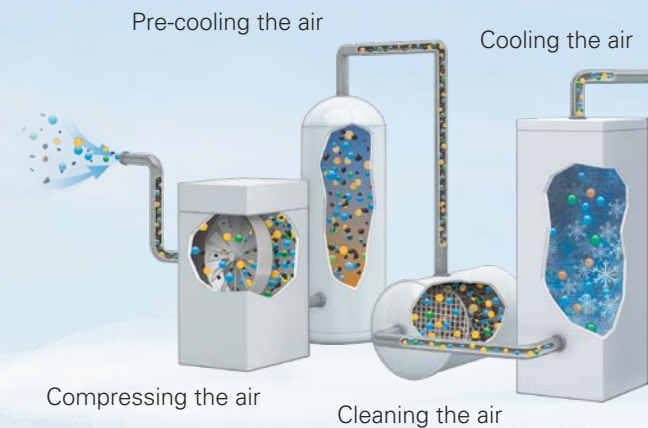
78%	Nitrogen (N ₂)
21%	Oxygen (O ₂)
0.9%	Argon (Ar)
0.1%	Carbon dioxide (CO ₂), Neon (Ne), Helium (He), Methane (CH ₄), Krypton (Kr), Hydrogen (H ₂), Nitrous oxide (N ₂ O), Xenon (Xe)

Where do Gases for Life come from?

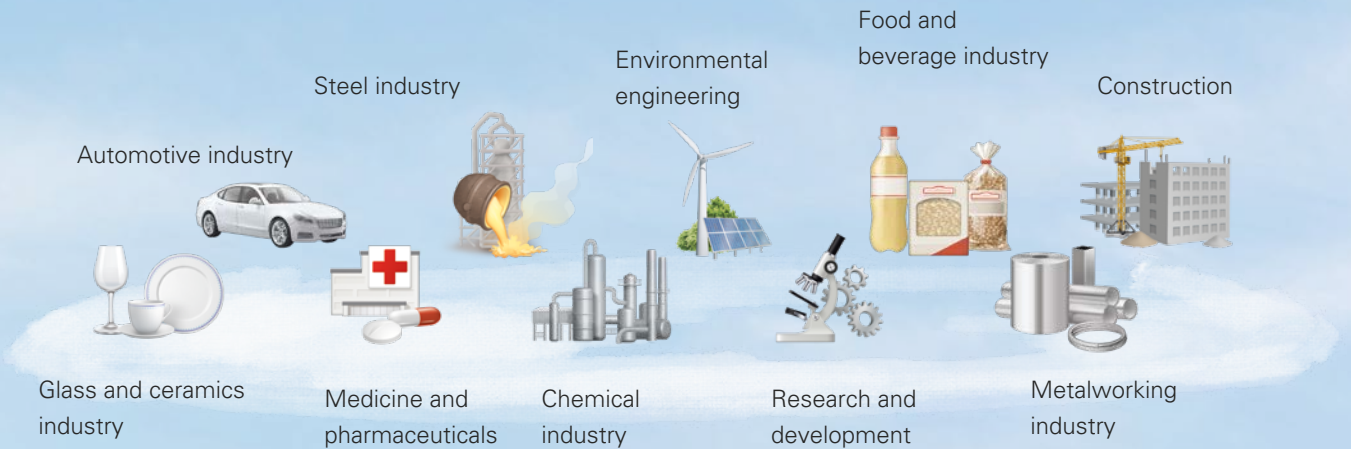


How are Gases for Life produced from air?

In order to produce these gases, we use air separation units which can reach 60 metres high or more. Inside them, a physical process takes place which separates the air into its components. This process is also known as cryogenic distillation.



Who needs Gases for Life?



How are Gases for Life supplied to the customer?

Smaller quantities: Pressurised gas cylinders

Larger quantities: Tanks on the customer's premises, delivery of gases in tank trucks

Major industrial quantities: Air separation units on the customer's premises; alternatively – where available – supply via pipeline





120urWay.

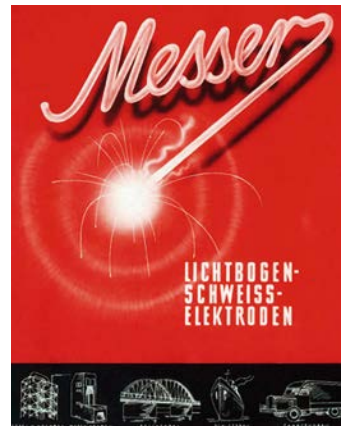
In 2018, Messer celebrated its 120th anniversary as a company. Over a period of twelve decades, we have continuously expanded our expertise while at the same time preserving our values. We have learned to overcome crises. We have used innovative gas applications to develop new business areas and markets. We have invested in growth and security of supply. We have focused on the needs of our customers. In short, we have done things our way over the past 120 years.

The upshot is that in 2018 we enjoyed the best financial year in our company's history. We will therefore continue to do things our way in future – together with our employees, who are an integral part of our success. Setting goals together and resolutely pursuing them is something we at Messer are good at.


Milestones as brief reports

In 2018, our anniversary year, we published milestone events from our 120-year company history via social media. These provide a time-lapse experience of the development of our family company.

Via the QR code (bottom right), you can view the online version of our Corporate Responsibility Report, where each milestone photo is accompanied by a brief explanatory text.







As owner and CEO of the largest family-run industrial gases specialist worldwide, Stefan Messer has been the driving force behind the strategies adopted for the future.

Dear Readers,

I am pleased to be able to report on another record year for Messer; a year in which we also celebrated our 120th anniversary.

In 2018, despite the politically unstable situation worldwide, we achieved double-digit growth, further improved our margin and brought our debt down to its lowest level since Messer Group GmbH was founded in 2004.

The biggest contribution to this result came from our activities in China, Vietnam and South-East Europe; the Western and Central Europe regions performed to plan with moderate growth.

In Messer's anniversary year, our plants in China operated at full capacity with prices at a high level. In China, new air separation units are in the planning stage or under construction in Changsha, Xiangtan, Zhangjiagang, Shunde, Chongqing, Dongguan and Hengyang. Among other things, this will greatly enhance our capacity for liquefied air gases, as our existing air gas capacities were almost fully utilised in 2018. The area of specialty gases is also being expanded further with the construction of a new plant in Quanjiao.

There are similar developments in Vietnam, where our major construction site in the centre of the country is making great progress: the two air separation units which will produce 80,000 Nm³ of oxygen per hour for our customer Hoa Phat are due to go into operation by the summer of 2019. We will realign our activities in the ASEAN region and run them from Bangkok in the future. Besides Vietnam, we will concentrate on the region's other large countries – Thailand and Malaysia – for the time being and develop new projects there.

In Serbia, our two main customers – the steelworks in Smederevo and the copper works in Bor – have been taken over by Chinese companies. Business has been stable again since then, especially with the plants' solvency now being assured.

In Slovenia, we successfully commissioned our new air separation unit at our customer Knauf Insulation's site in May following a very lengthy approval process.

In Hungary, we have enhanced our CO₂ capacity at the Olbő facility with a third phase of expansion. We have also succeeded in expanding our on-site business with a further two nitrogen generators.

The takeover of Buse's activities in Romania, which was completed in May 2018, will strengthen our market position in this country.

In Germany, we have started work on the construction of a hydrogen facility for Rütgers in Castrop-Rauxel and an air separation unit at the Saint-Gobain Isover site in Speyer.

We have come to an agreement with Mittal Steel about the construction of a new joint air separation unit to ensure a continued supply for the steel mill in Ostrava, Czech Republic, which has been supplied by us since 1993.

The absolute highlight of 2018 was the agreement with Linde and Praxair regarding the takeover of the American business operations that had to be sold for antitrust reasons as a result of the merger of these two competitors. In March 2019, together with financial partner CVC Capital Partners, we thus took over large parts of Linde's activities in the USA as well as all of Linde's subsidiaries in Canada, Brazil and Columbia. The transaction also included Praxair's subsidiary in Chile. The deal encompasses a total of 44 air separation units, 21 CO₂ plants, six hydrogen facilities, a helium source, twelve helium filling plants, a broad-based cylinder gases business in Canada and an extensive home care operation in Columbia.

We have merged the businesses acquired through this takeover with our existing activities in Western Europe – except ASCO Carbon Dioxide Ltd – and are running the merged entity as a separate subsidiary called Messer Industries GmbH, with the Messer Group holding 58 % and CVC 42 % of the capital.

This has established Messer as the largest family-run concern in its industry and as a global supplier in the world's key markets.

Our vision is to merge the two companies – Messer Group and Messer Industries – in a few years to create a group with sales of approximately 3.2 billion euro and 11,000 employees, operating more than 120 air separation units in over 40 countries. It would then be ranked fifth worldwide among international industrial gases companies.

The process of consolidation at our sister company MEC Holding was continued in 2018.

At Castolin Eutectic Group, the restructuring process initiated in 2017 is yielding better results – aided by stronger demand for our products in 2018. We want to use this financially stronger basis to continue to achieve sustainable growth in the coming years. After experiencing difficulties with underused capacity in recent years, our service segment in particular developed successfully in 2018. A major contribution to this came from the order that Monitor Coatings received to coat the decks of two British aircraft carriers. Our activities in the steel industry, the oil industry and the boiler coating segment also produced positive results. All in all, the Castolin Eutectic Group's development is satisfactory and makes us look optimistically into the next few years.

Messer Cutting Systems has shown determination in continuing its development into a modern digitalised company. Several global initiatives aimed at improving products, processes and market-related activities have been launched and some of them have already been implemented. For example, the new fibre laser machine has been unveiled, a modular system for standard machines developed and our service and customer service strengthened. Teamwork has been strengthened and a new, modern corporate culture created with the aid of an employee survey and the launch of a leadership development programme. On this basis – constantly in a process of development – we are building our new global strategy, which will lead to greater company successes in the coming years.

Our Spectron business unit continues to be run on a sound and robust basis. On 1 August 2018, we took over Concept Integrated Ltd., hitherto our agency in Singapore. The company has been renamed Spectron GCS Singapore Ltd. and will now also have responsibility for all the countries of the growing ASEAN region, thereby contributing to the growth of the Spectron Group. In addition, new product developments in the area of pressure regulators and pressure measuring equipment for high flow rates will have a positive influence on future business.

Unfortunately, the BIT Group has not developed as well as expected. We have reacted quickly and determinedly to the challenges facing us in order to make BIT fit for the future in its market. We remain committed to our strategy of establishing BIT as the preferred development and production partner for medical diagnostic equipment. A coaching programme carried out globally is intended to bring about a sustained improvement in corporate culture and management style by fostering courage, teamwork and an atmosphere of mutual trust. Our investments in the further expansion of our R&D capacities are also showing promising initial results. We are due to launch a number of new products in 2019. All in all, we expect an improvement in results and look to the future with confidence.

Thank you for your continued loyalty and your trust in our company.

Best wishes,



Stefan Messer

Management Board and Supervisory Board of the Messer Group GmbH:

Since the founding of the Messer Group GmbH in 2004, the Management Board has been supported by a supervisory board which assists with strategic decision making and always demands sustainable measures in addition to business success. The members of our Supervisory Board are considered to be experts in conducting business and always bring their experience to bear in a constructive manner. As such, they are reliable partners to the Messer family and the managing directors.



**Dr Uwe
Bechtolf**

Ernst Bode

**Dr Karl-Gerhard
Seifert**

Heike Niehues

**Dr Werner
Breuers**

**Dr Nathalie
von Siemens**

Stefan Messer

**Dr Jürgen
Heraeus**

Dr Bodo Lüttge

Supervisory Board of the Messer Group GmbH:

Dr Jürgen Heraeus, Chairman
Dr Werner Breuers
Heike Niehues
Dr Bodo Lüttge
Dr Karl-Gerhard Seifert
Dr Nathalie von Siemens

Management Board of the Messer Group GmbH:

Stefan Messer, Chief Executive Officer
Dr Uwe Bechtolf, Chief Financial Officer
Ernst Bode, Chief Operating Officer Europe
Johann Ringhofer, Chief Technique & Engineering Officer
Adolf Walth, Chief Sales & Marketing Officer

Supervisory Board Report

During the reporting period, the Supervisory Board performed the tasks incumbent upon it in accordance with the statutory provisions and the articles of association and provided support and advice to the Management. The Management reported to the Supervisory Board, both verbally and in writing, concerning the performance and situation of the company within the framework of regular meetings on 10 April 2018 and 22 November 2018. Furthermore, the Supervisory Board was informed about important business transactions and decisions. Legal transactions requiring the Board's approval were submitted to the Board for its decision. The Supervisory Board satisfied itself in the plenum that the bookkeeping, the annual financial statement of Messer Group GmbH and the Group accounts for the year ending 31 December 2018, as well as the management report from Messer Group GmbH and the national subsidiaries, had been audited and certified by the auditing company KPMG AG Wirtschaftsprüfungsgesellschaft, Essen. The audit reports were discussed at the Supervisory Board meeting on 4 April 2019 with the assistance of the auditors. The Supervisory Board had no objections and expressed its agreement with the auditor's results.

The Supervisory Board would like to thank the Management as well as all employees of Messer for their efforts and successful work in the 2018 financial year.

The Supervisory Board



Dr Jürgen Heraeus, Chairman

Corporate Responsibility Report of the Messer Group GmbH

Commitments to sustainability

Stefan Messer, owner and Chief Executive Officer:

“We recognise and accept our social responsibility towards our employees and society in different areas. Among other things, we are committed to environmental and climate protection by constantly improving our own processes and focusing our development on technologies that make our customers’ production processes more efficient and environmentally friendly. Messer is represented in the world’s major markets: we respect the cultural differences as well as rights in the regions in which we operate. We contribute to community life and education in these regions through the provision of wide-ranging support. Mutual trust and respect for human diversity, open communication in the workplace and the ongoing development of our employees are deep-rooted values forming the immutable basis of how we deal with each other.”



Dr Uwe Bechtolf, Chief Financial Officer:

"We are committed to sustainable economic activity and guarantee our autonomy and independence through forward-looking investments. In this way, our employees, business partners and financial partners have long-term security in working with us. We operate with maximum transparency vis-à-vis our stakeholders. We view corporate responsibility as a matter of strategic value by using defined key performance indicators as a management basis, by implementing it in our management organisation and by using the GRI (Global Reporting Initiative) Standard as our guide in sustainability reporting. We follow an established code of conduct that governs our cooperation and conduct with regard to all our stakeholders."

**Ernst Bode, Chief Operating Officer Europe:**

"Our aim is to become the best organised company in our industry. Capital and financial resources are important, but people, knowledge, leadership qualities and passion are the ingredients of long-term success. At the same time, our activities are focused on the safety of our customers, employees and partners as well as the safety of the systems and facilities installed by us and the distribution channels used by us. Our constant pursuit of sustained improvement in the efficiency of our facilities and logistics processes and the associated conservation of resources are just as much part of our brand essence as the provision of a reliable product supply at fair prices and a relationship with our customers that is based on partnership. Product purity and a documented supply chain are taken for granted at Messer. Our activities in our markets are focused on the future and on sustainability in order to ensure long-term development for both ourselves and our customers. 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."



Marcel Messer, shareholder and adviser to the Management of the Messer Group GmbH:

“As the majority shareholder of the Messer Group GmbH, the Messer family recognises and accepts its social responsibility. The aim is always to conduct responsible and sustainable economic activity to ensure growth within the framework of our social integration into society. In this regard, I would particularly like to highlight the respectful and responsible way in which we deal with our employees, the non-negotiable nature of our open-mindedness and tolerance, the importance of the continuity of our tradition and independence, full compliance with laws and regulations as a minimum requirement in all our actions, environmental responsibility and sustainability as well as integrity and loyalty.

Many of our employees have been with us for many years or even decades and rightly have a feeling of security in a family-like environment. The success of our company is based, to a large extent, on their loyalty over many years. In our family company, a respectful approach to employees as well as their safety is of paramount importance.

As a member of the fourth generation, I am committed in particular to open-mindedness, diversity, tolerance and respect for cultural differences – without limitation or exception. Intolerance, racism or sexism are completely at odds with the values of our family and our family business. 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.

I also declare my support for the tradition and continuity of our history spanning more than 120 years. Our customers as well as our

employees can be sure of the family’s continued influence on our corporate culture and strategy. As a value-oriented family company, we thus create a basis for reliability, mutual trust, loyalty and integrity.

We also commit ourselves to protecting our environment and the climate by continuously improving our processes and focusing our development on technologies that make our customers’ production processes more efficient and resource-friendly.

As a member of the fourth generation, I commit myself to always supporting equal opportunities, safety, diversity, environmental awareness, mutual respect, compliance with all laws without exception and the continuation of our tradition spanning over 120 years.”



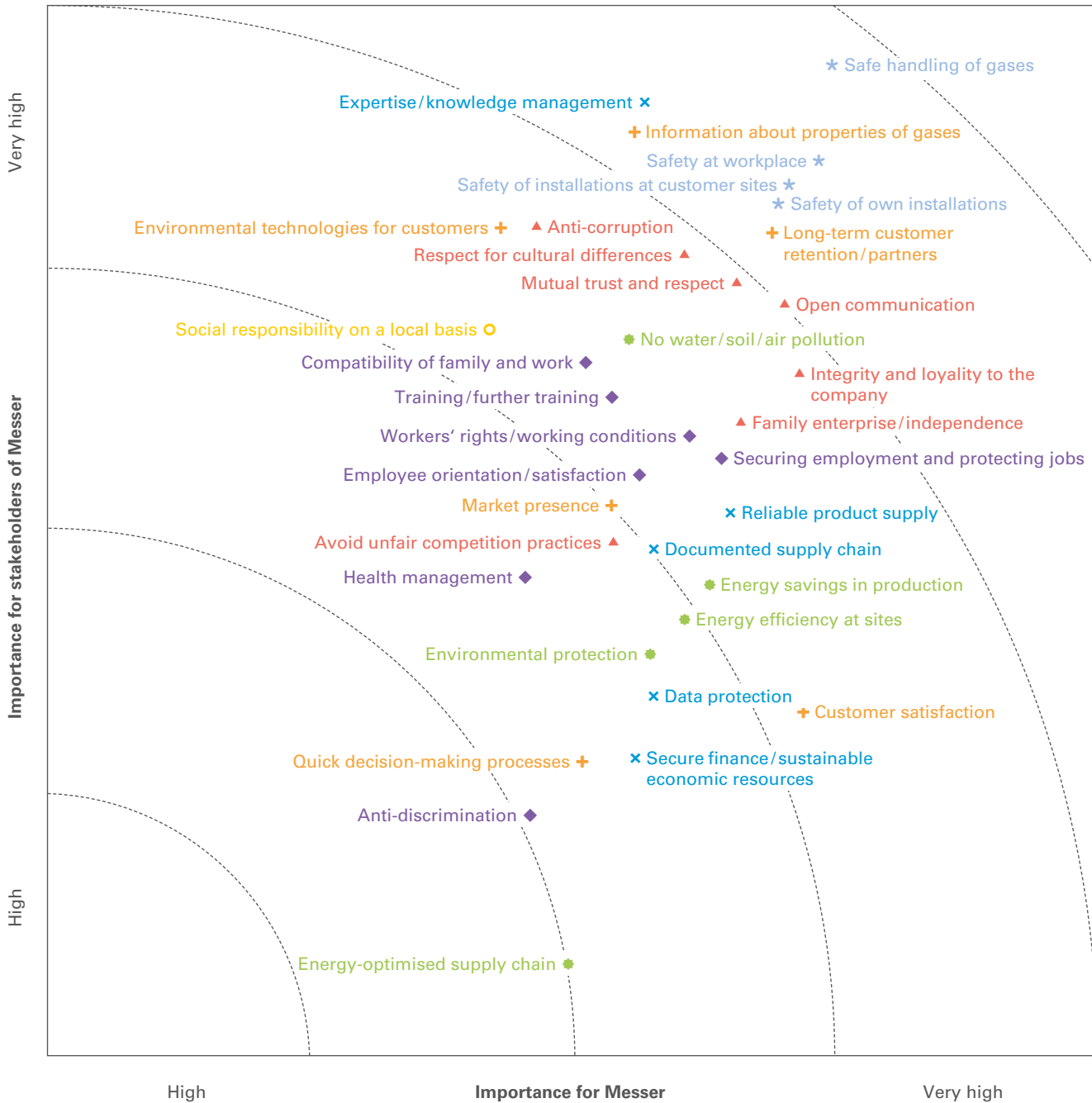
Strategic integration of corporate responsibility

The key themes concerning our responsibility in economic and social spheres are derived from our own objectives, traditions and innovations as well as from general standards. The core areas are our values as a company, our customers and the markets in which we operate, climate and environmental protection, safety, our employees, and society. Since Messer Group GmbH was founded, we have been pursuing long-term objectives to take the company forward on an independent and profitable footing. We have always observed the principles of the “honourable businessman”, acting responsibly with regard to our place in society. Our corporate responsibility has been strategically embedded in our processes since 2014 through the cross-divisional Corporate Responsibility function. We have set ourselves measurable goals in the different business units to document our improvements and development. We are publishing these goals in this Corporate Responsibility Report for the 2018 financial year, which features comparisons with the results achieved in 2017. These key performance indicators are transparent and comparable, enabling our stakeholders to understand and assess how we are developing. In this context, we support our customers’ aim of checking and ensuring the sustainability of their own activities and supply chains. At our customers’ request we therefore also report to contracted third parties, for example EcoVadis, the ‘Carbon Disclosure Project’ and the chemical industry’s worldwide “Responsible Care” initiative.

Generation of materiality matrix

The key issues we address in our strategic sustainability process are the product of our daily and long-term actions and activities. When evaluating these topics, we consider it important to include representatives of all stakeholder groups. For this reason, we have compiled a comprehensive list comprising 77 individual topics within the categories of environment/climate protection, economy/business, values, products/services/markets, safety, information/data protection, customers, employees, society as well as suppliers. In order to differentiate the priorities of our internal stakeholder groups, such as owners, management and employees, 48 senior managers and 355 employees voluntarily completed an anonymous online survey where they ranked the topics on a scale of one to ten, with one being important and ten extremely important. Selected journalists also participated in the anonymous online survey. As in previous years, the safety of our customers and employees is of utmost importance to our company. All important issues can be affected by our decisions and can have potential effects on stakeholders outside the organisation too. For this reason, all major projects, both in-house and external to the organisation, are relevant.

Materiality matrix



- ▲ Values
- ✕ Economy and business
- ★ Environmental and climate protection
- + Customers and markets
- ◆ Employees
- ★ Safety
- Society

Corporate Responsibility

Customer and employee orientation, responsible behaviour, corporate responsibility as well as open communication, trust and respect: all of these are embedded in Messer's mission statement. Shortly after bringing all of the company's shares back into family ownership in 2004, Stefan Messer personally drove forward a discussion of values, which led to a company-wide vision and mission as well as the formulation of the company's values.

We act sustainably to meet the needs of our customers in accordance with our collective responsibility for people, progress and the environment. In order to make these values and the corresponding developments measurable and comparable, Messer introduced sustainability key performance indicators (KPI) for the first time in 2014.

With effect from 1 January 2018, the Business Development/CSR position in Central Sales Functions was filled again with the aim of further improving Messer's sustainability performance. In conjunction with this, we want to improve customer satisfaction as well as our sustainability rating provided by external organisations such as EcoVadis and Carbon Disclosure Project (CDP).

The following twelve topics are relevant for each company in the Group:

	Unit	2017	2018
1. Safety of our employees			
Number of Lost Time Injuries (Messer employees)	persons	15	14
Lost Time Injury Frequency Rate - LTI FR (Messer employees lost time injuries)	per million working hours	1.4	1.3
Lost Time Injury Severity Rate - LTI SR (Messer employees lost days)	per million working hours	45.4	64.0
Number of Recordable Working Injuries - RWIs (Messer Employees)	number	37	23
Recordable Working Injury Frequency Rate - RWI FR (Recordable injuries per million working hours)	per million working hours	3.5	2.2
Fatalities (Messer employees)	persons	1	0
2. Safety of our logistics			
Cylinder fleet: Number of preventable incidents	number	4	9
Cylinder fleet: Frequency Rate (Number of preventable incidents per million driven kilometres)	per million driven kilometres	0.17	0.41
Bulk Fleet: Number of preventable incidents	number	13	14
Bulk Fleet: Frequency Rate (Number of preventable incidents per million driven kilometres)	per million driven kilometres	0.15	0.19
3. Safety of our customers			
Total number of customer installations (Messer owned)	number	8,808	8,890
Number of technical reviews of customer installations	number	9,171	9,395
Ratio: Number of technical reviews / Number of Messer owned customer installations	number	1.04	1.06
Number of safety audits at customer sites with Messer's installations	number	1,582	2,170
Ratio: Number of safety audits at customer sites / number of Messer owned customer installations	number	0.18	0.24
Number of safety trainings provided to customers at any customer site	number	1,590	1,563
Total number of customer training participants	persons	4,716	5,273

	Unit	2017	2018
4. Mutual trust and respect			
Number of cases reported in respect to discrimination	number	1	1
5. Energy efficiency in production			
Energy coefficient (energy consumption in relation to energy weight of sold product)	kWh	1.345	1.308
6. Open communication and cooperation with stakeholders			
Media resonance analysis: Gross coverage	million persons	54.9	901.8
Monitoring of brand awareness (Germany)	per cent	12.8	17.0
7. Protection of the environment			
CO ₂ Footprint of plants and logistic	million tonnes of CO ₂ e	3.36	3.38
Specific CO ₂ Footprint of plants and logistic	million tonnes of CO ₂ e / '000 EUR	2.73	2.50
Number of production / filling companies in EU certified to ISO 14001	number	21	23
Number of new customer installations (bulk) for applications which protect the environment	number	253	242
8. Independent, family-run company values			
Net Debt/EBITDA-Ratio	number	1.00	0.67
EBITDA/Sales-Ratio	per cent	23.5	27.1
9. Customer satisfaction			
Number of participants in customer satisfaction surveys across the Group	persons	1,326	1,522
Percentage of credit notes in relation to number of invoices issued	per cent	1.5	1.4
10. Employee satisfaction			
Average length of service	years	10.6	10.6
Staff turnover rate	per cent	6.9	7.4
Lost days due to sickness per employee	days	4.4	4.1
11. Employee development			
Expenditures on training programmes per employee	Euro	277	243
Training days per employee	days	3.38	2.80
Apprentices and trainees in total workforce	persons	41	22
12. Compliance			
Inquiries submitted to the "Ask us help desk"	Compliance cases reported	0	1

Our Values





Our Values

The group of companies run by Stefan Messer celebrated its 120th anniversary in 2018. The company was founded by Adolf Messer in 1898. At that time, he employed four blue-collar workers and one salaried employee at his workshop for the fabrication of acetylene gas generators in Frankfurt-Höchst. Today, Messer is a group of companies with some 14,000 employees worldwide.

Marcel Messer, Stefan Messer's son, began his Messer career on 1 May 2018. He has been working in the role of Adviser to the Management at Messer Group since 1 March 2019. Marcel Messer previously spent three years in the finance industry working for the world's largest asset manager, BlackRock in London. Alongside his brother-in-law Cédric Casamayou, Marcel Messer is thus the second member of the fourth generation of the Messer family to have joined the company. Cédric Casamayou has a master's in management and finance from the Grenoble Business School and is a Chartered Financial Analyst (CFA). He is currently in charge of Messer's "Family Office" and holds the position of Group Controller in the Corporate Office at Messer Group in Bad Soden.

Marcel Messer has a master's in finance from the Frankfurt School of Finance and Management. Whilst studying for his master's degree, he also worked part-time at KPMG. He did his bachelor's degree in international business in London, with a year abroad in Paris and several internships at various industrial companies, the Frankfurt Chamber of Commerce and Industry, Bayerische Hypo- und Vereinsbank, JP Morgan in Hong Kong as well as Messer in China and

Switzerland. Since 2014, he has also been a Chartered Alternative Investment Analyst (CAIA) and thus qualified to manage portfolios and alternative investments.

Company History

In 1898, Adolf Messer started production of acetylene lighting installations and acetylene gas generators. When electric lighting and incandescent gas lighting replaced acetylene lighting at the start of the 20th century, he concentrated exclusively on the production of equipment for oxy-fuel welding and cutting. Besides oxy-fuel technology, air separation units became the second pillar: Adolf Messer put his first air separation unit into operation himself in Madrid in 1910. Under Hans Messer, the founder's son, Adolf Messer GmbH merged with parts of Knapsack-Griesheim AG to form Messer Griesheim GmbH in 1965. In the years following the merger, the company grew in Europe and North America. In 1993, Hans Messer took a step back from running the business and handed the reins over to a manager from outside the family. After a risky expansion course and the near-collapse of the company, the founder's grandson, Stefan Messer, was eventually appointed CEO in 1998. Together with financial investors, he put the company back on its feet over a period of three years before restoring its status as a family-owned business in 2004. This marked the birth of today's Messer Group GmbH. Stefan Messer and his staff work as a team in line with defined values and growth strategies which they mutually work out and define.

Commitment in the Economic Sphere

At Messer, there is wide-ranging commitment on the part of owner and CEO Stefan Messer, the executives and employees alike. This makes it possible to widen the scope for action and exchange market-related experience via networks and cooperative initiatives.

The owner's personal commitment

As Vice President and member of the General Assembly of the Frankfurt am Main Chamber of Commerce and Industry (IHK), Stefan Messer holds the office of Chairman of the foreign trade committee there. Furthermore, he is 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 the board of trustees of the China Institute at the Goethe University Frankfurt. 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 Commerzbank AG's advisory committee for the state of Hesse and a member of HDI Gerling's state advisory committee. He is also a member of the executive board 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. Stefan Messer is also involved in ASU – Die Familienunternehmer, an association of family entrepreneurs that supports 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 German Asia-Pacific Business 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 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. At the beginning of each workshop organised by the EIGA, the members are reminded of the importance of complying with the "EIGA anti-trust meeting rules". Messer is also a member of the International Oxygen Manufacturers Association (IOMA), the German Committee on Eastern European Economic Relations and the German Asia-Pacific Business Association (OAV). Messer employees are represented in all governing bodies of these associations. 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 is also involved in the family business association "Die Familienunternehmer e.V.", in the FBN Family Business Network and in the FrankfurtRheinMain e.V. economic initiative. Messer employees sit on expert committees, support research projects, and establish and maintain contact with expert groups in technologically advanced fields. The subsidiaries are involved in different local industry associations. The Messer companies are also involved in organisations in their local regions.

Messer Compliance Management System

The Messer Compliance Management System (Messer CMS), which we implemented in 2010, is an organisational concept that describes Messer's system of values and its practical implementation and defines the responsibilities derived from it. 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 Messer. The managing directors and senior management are fully committed to the Messer CMS. As a system of values, its purpose is to establish a relationship with our customers, partners and employees as well as with our competitors, the public and the media, based on fairness, solidarity and trust, to resolve conflicts of interest and ensure compliance with the applicable laws, regulatory provisions and inter-company and company-internal policy guidelines within all divisions of Messer. The CMS developed for this purpose supports those responsible in the setting-up and implementation process and is also designed to prevent, as far as possible, any breaches of the Messer Code occurring in the first place.

Messer Code

The management of Messer Group GmbH has summarised the principles for the organisational concept in a set of rules (the "Messer Code"). The Messer Code stands for active corporate governance for the purpose of good business management and is intended as a guide for all employees in their day-to-day working life while taking into account the Messer Mission Statement. Managing directors must take appropriate measures to ensure that all employees have unrestricted access to the Messer Code

and are aware of where and how it can be consulted.

The Messer Code of Conduct is the core document within the Messer Code. It is supplemented and given substance by Guidelines as well as other binding internal regulations.

Our employees are obliged to observe applicable laws and the rules of the Messer Code when performing their work.

We also expect our business partners, customers and other parties who work with Messer to observe applicable laws and the principles of the Messer Code.

Compliance officers

The management of Messer Group GmbH bears responsibility for monitoring the Messer CMS. This organisational concept is binding for all managing directors, senior management staff and employees of the Messer Group.

The local managing directors are responsible for implementing this organisational concept in their own national subsidiary and ensuring that it is adhered to while observing applicable legal regulations. The board of Messer Group GmbH has appointed a Corporate Compliance Officer (CCO) to support the managing directors and the supervisory bodies in their duties. In addition, there are Local Compliance Officers (LCOs) who are designated by the regional directors in consultation with the respective national managing directors. The team of compliance officers is supplemented by the corporate departmental heads in the Corporate Office, who act as department-specific compliance officers ((fach)bereichsbezogene Compliance Officer, BCOs). The management of Messer Group GmbH has defined the general tasks, rights and obligations of the compliance officers in a Compliance Officer Guideline document.

Managing directors, senior management, the CCO, LCOs and BCOs also serve as role models. They are expected to demonstrate a high degree of social and ethical competence. Managing directors and senior management are expected to demonstrate an appropriate degree of organisation, leadership, communication, selectivity, oversight and direction in their activities. Moreover, they are obliged to protect customers, employees and the environment. In this context, a clear commitment to conducting business in compliance with the law is just as essential as preventing and disciplining illegal practices.

Training programme

Besides traditional classroom training, there are webinars and e-learning courses given on selected topics relating to the Messer Code. The corporate departments, and the local management and departments generally decide on the content of the courses and the employees to be trained. They assume responsibility for arranging and giving the training courses, supported by external service providers as necessary, and ensuring that proper documentation is issued. The Messer Group GmbH management may mandate training courses and specific course content as well as the group of employees to be trained.

Reporting and auditing

Important business matters are regulated by a defined approval process and reporting system governed by the Group Guidelines, by the largely standardised articles of association, by the rules of procedure for the boards of management of the (national) subsidiaries, by an approval and information list stipulating decision-making responsibilities among local management and their boards, regional management, corporate management and the Executive Board as well as the Supervisory Board of Messer Group GmbH, by signature regulations based on dual responsibility, and by specific requirements issued by the corporate divisions.

In addition to this, local, regional and departmental meetings are held regularly to discuss and coordinate topics and to exchange information and report about experiences.

The most important procedures at Messer are defined and often certified (e.g. ISO, GMP). Existing organisational structures are used to ensure adherence to the Messer Code. Each department, the regional managers and the management bodies have direct responsibility. Thus, each area of responsibility is accountable for ensuring implementation and observation of the Messer Code.

The Internal Audit team, supported by Corporate Legal and representatives of other departments, performs regular audits of all national subsidiaries which last several days. During the process, matters pertaining to the Messer Code (e.g. articles of association, rules of procedure, signature regulations, training provided, compliance with the reporting procedures, etc.) are also examined in detail. Individual departments also perform other detailed audits (e.g. SHEQ, Medical, IT). Findings and suggestions for improvement are documented in a report which is submitted to the Messer Group GmbH Executive Board. Follow-up audits are carried out in a specific time frame to check whether suggestions for improvement are being implemented.

Every three months, pending and threatened/imminent legal disputes which exceed a certain value/risk are queried centrally and the facts of the case, dispute value, litigation status, litigation risk and financial provisions already made or which may prove necessary are recorded. The managing directors/LCOs and BCOs are obliged to inform the CCO of any suspicion of a serious breach of the Messer Code. The CCO shall report to the Messer Group GmbH Executive Board and the Supervisory Board on a regular basis, and on request in specific cases about any serious breaches of the Messer Code of which he or she has been informed, in a timely manner, or otherwise once a year. Likewise, once a year, all national subsidiaries and corporate departments report any issues relevant for the Risk Report to the VP Internal Audit. This is discussed by the Messer Group GmbH Executive Board, which then decides on any further measures that may need to be taken. These are then submitted to the Messer Group GmbH Supervisory Board along with further explanations as needed for information purposes.

Reporting in the event of compliance infringements and justified cases of suspicion

The managing directors and senior management must organise their area of responsibility such that reports from employees about infringements of applicable law or the Messer Code ("compliance infringements"), as well as justifiable cases of suspicion, can be submitted to them in a timely manner in order to ensure that prompt remedial action can be taken.

Part of the reporting process involves drawing up a report which records the action taken in response to confirmed compliance infringements. This includes a description of how the incident was investigated, how the consequences of the wrongdoing were established and what decision was made regarding further action.

The managing directors must take appropriate measures to ensure that all employees are informed about how and to whom breaches of the Messer Code are to be reported, including publishing a telephone hotline number and the compliance e-mail address. A total of 71 suspected compliance infringements were reported in 2018 (previous year: 69 suspected cases). This figure breaks down as follows: 20 in the Western Europe region, 19 in the South-East Europe region, 9 in Central Europe and 23 in Asia.

Revision of Group Guidelines, List of Matters Requiring Approval and Legal Manual

The management of Messer Group GmbH adopted a revised version of the Group Guidelines in 2018. The sections that have been revised are "Legal Matters" (including the "Legal Manual"), "SHEQ – Safety, Health, Environment and Quality Management" and "Medical, Pharmaceutical and Food Gases". Furthermore, definitions and translations were corrected and the order of some sections changed. The changes are intended to improve comprehension of the individual sections as well as the Group Guidelines as a whole.

The List of Matters Requiring Approval (previously: List of Approvals for the Supervisory Body) has also been revised. In addition to the requirements of the supervisory bodies, it now also features tables depicting the approval and information obligations with regard to other bodies and persons (in particular regional directors and the management), along with the applicable threshold values in each case.

Changes in Messer Group's purchasing policy

Messer Group's purchasing policy has been supplemented with the requirement to henceforth adhere to the principles enshrined in the "UN Global Compact" when selecting and auditing suppliers.

The UN Global Compact is the world's largest corporate responsibility initiative. It focuses on key issues such as human rights, labour standards, environmental protection and prevention of corruption, compliance with which the "Messer Code of Conduct" explicitly refers to as well.

New Food Safety Commitment and new Manual for Food Safety

In 2018, as part of a continuous improvement process, the Management of Messer Group GmbH adopted a new version of the "Food Safety Commitment" and a new "Handbook for Food Safety" as binding CMS documents within the Compliance Management System (CMS). The new manual sets out the obligations of the "Food Safety Commitment" and the "Messer Group Guidelines" in more detail and stipulates Messer's specific requirements regarding food safety. Its purpose is to support the Messer companies in meeting their core obligations under Food Law.

Compliance-relevant excerpt from Corporate Design Manual

Design adjustments and the integration of new areas necessitated a revision of the Corporate Design Manual (CD Manual) used by Messer. What is new is the fact that, as of now, it is no longer the complete set of rules that is compliance-relevant: instead, it was decided in 2018 to adopt an excerpt from the manual as a legally binding compliance document. Its content deals with the guidelines regarding use of the Messer logo as well as vessel and vehicle labelling. This regulation, focusing as it does on indispensable aspects, reduces the hitherto considerable burden of coordination and approval work involved in each change.

Company Reputation and Brand Awareness

Our brand is made up of the name of the Messer family and the additional phrase "Gases for Life". It is used to market our products and services worldwide. By associating our brand with positive connotations, we are looking to gain long-term competitive advantages through emotional branding.

To this end, between 2013 and 2018, we regularly evaluated the Messer brand's reputation scores and the media response in Germany. We carried out telephone surveys of approximately 1,000 private individuals in selected German cities to measure brand awareness.

We always measure brand awareness after the end of a financial year.

In view of new data protection regulations, we decided not to conduct our usual survey of private individuals for the 2018 financial year, instead initiating a corresponding B2B positioning survey. This involved surveying 4,000 companies in selected industries with

operations in the towns of Bad Soden am Taunus, Duisburg, Frankfurt am Main, Freiburg, Hamburg, Krefeld, Siegen and Munich. In total, 795 responses were generated from companies in the automotive supply, chemical, research, metal processing, pharmaceutical, welding and pulp/paper sectors. According to the information at the respondents' disposal, 23 % of the companies use industrial gases; 18 % do not use industrial gases. 59 % of respondents said they did not know. In response to the unaided question "Which manufacturers of industrial gases can you name?", 17 % named Messer as a supplier; only one German competitor achieved a slightly higher figure with 20 %. In response to the aided question "Are you familiar with Messer as a manufacturer of industrial gases?", 24 % answered yes. The highest level of awareness of the Messer brand is found among automotive suppliers, welding shops and metal processing firms; Messer is not well-known as a manufacturer of industrial gases in the pharmaceutical and pulp/paper sectors. 14 % of the companies surveyed perceive Messer as a market leader in the industrial gases sector. 79 % were unable to give an assessment in this regard. Based especially on values for the towns of Krefeld, Siegen and Frankfurt (14 %), Messer is perceived as friendly. 86 % did not give an assessment in this regard. At the end of 2017, 1,068 private individuals were surveyed regarding the level of awareness of the Messer brand. At the time, Messer achieved a value of 12.8 % for the unaided question.

Open Communication with our Stakeholders

The basis for a good relationship characterised by familiarity and trust can only be created through open and honest communication. This is why keeping in regular contact with customers, suppliers, partners, employees, industrial firms and organisations, with the media, our neighbours, the general public and the internet community – and not forgetting our valued retirees – is so important to us. Our communication channels are as varied as the needs of our stakeholders. Information about the Messer brand, product features or special technologies and services has to be compiled and made available in a suitable format, and it should be easily accessible. Messer uses a variety of channels to do this.

At Messer, the tools used for external communication are just as important as those used for internal communication. The channels of external communication include our corporate web presence, the websites of our national subsidiaries and specialist departments, press and public relations work, trade show appearances and exhibitions, image brochures, business reports, sponsoring and a quarterly customer magazine entitled "Gases for Life", as well as a website of the same name: www.GasesforLife.de. When it comes to press and public relations work, Messer maintains close contact with the regional press as well as business and specialist publications.

In 2018, Messer Group further intensified its public relations work, above all in social media such as Facebook and Twitter – but also achieved high reach levels in classical media. It issued 30 press releases over the course of the year.

The media response analysis shows that Messer attained a gross reach of 901.8 million people with its publications in independent online and print media. In 2017, the gross reach was 54.9 million people. Media reach is determined by independent specialist agencies according to standard criteria to ensure comparability. Gross reach indicates the number of people potentially contacted and is calculated on the basis of the media's circulation and access figures. The very sharp increase in gross reach achieved in 2018 is mainly due to the fact that reports on the merger of our competitors Linde AG und Praxair, Inc. named Messer as a potential buyer of the shares to be disposed of as a condition of the merger to satisfy anti-trust requirements. Our own publications also attracted greater interest in the media. As in the previous year, all of the reports published about Messer in 2018 were positive and provided an accurate picture of our business activities.

We intensified our social media activities during our anniversary year, achieving high reach levels, particularly with the weekly publication of our history under the hashtag MesserStory on Facebook and Twitter. For example, our Twitter channel on average received some 20,000 hits a month. This special form of history marketing was used by a student working group at the Goethe University in Frankfurt as a best practice template for a history workshop.

In terms of internal communication, we communicate current strategic information via a Group-wide newsletter. Our employee magazine is published three times a year and features People, Projects and Strategy as its main sections. We make all department-related information, internal newsletters and press reports available in German and English via MesserNet, a Group-wide intranet. Since January 2018, the intranet has been run in a portal solution. The portal allows customisations, offers integrated content and document management and facilitates participation in blogs and forums.

China: New WeChat presence

In March 2018, immediately after the Chinese New Year, Messer China launched its new WeChat presence. The company has since been using this platform to share interesting information with selected target groups or the public on a regular basis. This includes news as well as interesting facts about the company, its applications or gases. The WeChat presence gained more than 1000 followers within two months. This success is partly due to close cooperation with the WeChat team at Messer Cutting Systems China: important content, such as the Chinese version of the "Messer Story" and relevant news, is published at the same time, enhancing the impact and scope of the information.

Messer Awards

Induction into “Family Business Hall of Fame”

Stefan Messer was inducted into the Family Business Hall of Fame on 16 January 2019 in a ceremony in Munich held in front of around 200 invited guests from the realms of business, politics and society. Every year, German business daily Handelsblatt, auditing and consulting firm KPMG and family business foundation Stiftung Familienunternehmen jointly bestow the distinction on outstanding personalities from family enterprises and medium-sized companies. Stefan Messer was presented with the award for sustainable business management, in particular for Messer’s positive development since its return to family control.

AXIA Best Managed Companies Award

In the application phase for the Axia Best Managed Companies Award, Messer Group managed to qualify for the final round in 2018. In a further step, Messer Group will take part in an Axia BMC Coaching Session in 2019 to identify the company’s main strengths, challenges and areas of potential in four core areas, these being Strategy, Productivity & Innovation, Culture & Commitment and Governance & Finance. An award ceremony is expected to take place in 2019.

Rating Certificate in Switzerland

In 2018, for the eighth consecutive year, credit rating agency Bisnode D&B Schweiz AG awarded Messer in Switzerland a Rating Certificate with Risk Indicator 1, which represents a minimal default risk. Only two per cent of all companies in Switzerland meet the conditions for this top category. The certifi-



Stefan Messer accepted the award, accompanied by his son Marcel (right), his daughter Maureen (centre) and her husband Cédric Casamayou (2nd from right). Presenter Judith Rakers (left) hosted the evening event.

cate distinguishes Messer in Switzerland as a trustworthy, reliable, economically healthy and stable business partner. Bisnode D&B is a partner in the network run by Dun & Bradstreet, the world's largest service provider for business-to-business economic information.

Chamber of commerce honours Messer Schweiz

In 2018, Messer in Switzerland was honoured by the German-Swiss Chamber of Commerce in recognition of the company's 25 years of membership and its special contribution to the promotion of economic relations between Switzerland and Germany as an active member of the chamber. Stefan Messer supports the activities of the German-Swiss Chamber of Commerce in his capacity as member of the board.

TOP 100 in Bosnia-Herzegovina

In September 2018, Messer BH Gas was ranked among the 100 biggest companies in Bosnia-Herzegovina for 2017 by "Poslovne novine", one of the country's leading business magazines. The company ranking was based on annual sales, the operating result, export figures and investment. This distinction is clear proof of success; it also provides confirmation for business partners and the public that the companies are committed to further development. The ranking is also a signal for potential investors looking for opportunities and seeking to implement new projects in Bosnia-Herzegovina.

"Employer – Organiser of Safe Work" award

In October 2018, our subsidiary Eloros, which has its production site in Rybnik, Poland, was awarded a statue in the category "Companies with up to 50 employees" as part of the 25th "Employer – Organiser of Safe Work" competition. The annual event is organised at a regional level by the state labour inspectorate. The aim of the competition is to support

companies that ensure high work safety and health standards for their employees and comply with the applicable labour laws.

Safety Awards

Messer received six Safety Awards for exemplary work safety from the European Industrial Gases Association (EIGA) on the occasion of its Summer Session, which was held in Riga, Latvia, in June 2018 (see section on Safety).

FEIQUE Safety Award received again

In June 2018, Messer Ibérica once again received the "FEIQUE Safety Award" in recognition of outstanding results in the prevention of industrial accidents. All the production sites operated by the Spanish Messer subsidiary were accident-free during the 210,005 hours worked in 2017. The award was presented by the director of the National Institute for Safety, Health and Wellbeing at Work (INSSBT) and the chairman of FEIQUE's safety commission. Every year, FEIQUE, the business federation of the Spanish chemical industry, bestows safety awards in recognition of the commitment shown and resources deployed by companies in the industry to ensure the safety of their employees. Messer Ibérica has received the award for the seventh time. In 2018, the company marked 15 years of accident-free working at the site of its air separation unit in Vilaseca as well as ten years with zero accidents at the air separation site in El Morell.

Our Employees





Our Employees

Diversity

As of 1st March 2019, Messer's workforce, including at equity consolidated Messer Industries GmbH, totals over 11,000 employees in Europe, Asia and America. Most of our social and business opportunities arise from our diversity: we differ in terms of origin, culture, age, gender and sexual identity, religious persuasion and world view, but we pursue a common business objective. We want to foster appreciation of the diversity of employees within Messer through our system of values, intercultural working groups and international communication. In future we will focus even greater attention on all diversity-related issues in order to develop suitable additional measures aimed at further fostering mutual understanding as well as appreciation of the variety of skills and talents. A working group is also looking into the appropriate form of address in internal and external communication in order to treat men, women and "diverse" equally. The results are expected to be implemented in 2019.

Diversity initiative by German family businesses

In 2018 Messer decided to support an advertising initiative by German family businesses which addresses diversity in the workforce. Under the slogan "Made in Germany – Made by diversity", 50 family companies that employ staff from all over the world have been running an extensive campaign since March 2019 to promote a Germany that is open to the world.

Staff structure and length of employment in 2018

As at 31 December 2018, Messer had 5,805 employees, 2.3 % more than in 2017 despite the disposal of the Messer company in Peru. A total of 2,947 employees worked in the commercial areas. As in the year before, the proportion of women in the workforce was 23 %. A total of 416 persons held positions as first and second-tier managers, with 25 % of them being women. The number of employees on fixed-term contracts increased slightly from 204 in 2017 to 257 in 2018. There was also a marked increase in the number of part-time employees from 140 in 2017 to 179 in 2018. Our entire staff included 29 people with severe disabilities. In total, 76 employees were actively involved in supervisory bodies.

Across the Group, the average length of service of our staff since the date of joining was 10.6 years, as in 2017. Total staff turnover increased from 6.9 % in 2017 to 7.4 % in 2018. This is mainly due to employees leaving a number of smaller companies in South-East Europe. The average age of our staff was 42.7 years. The number of sick days per employee was 4.1 in 2018, a slight drop compared with the previous year.

Training and Professional Development

In order to ensure that we continue to have well-trained employees in the future, we take measures to attract school students and higher-education students to the fascinating world of gases. These measures include facilitating undergraduate and master's theses as well as student internships and work placements for school students. We also seek to get younger students interested in our fields of work. In 2018, for example, 16 school students had the opportunity to spend a day in our Corporate Communications department gaining practical experience as part of an initiative to familiarise young people with occupational fields; this led on to three 3-week work placements. We also offered school student work placements in the area of IT.

Messer is committed to providing educational and vocational training opportunities to the next generation of young employees as this is seen as a vital investment in the future competitiveness and efficiency of our company. In Germany we offer vocational training to motivated and hard-working school and college leavers in the areas of industrial business studies, mechatronics, IT data processing and IT support. Training takes place at various sites, in some cases supplemented by several weeks spent at international locations. In addition, dual courses of studies are supported, sometimes following on from successfully completed in-house training.

However, the number of apprentices and trainees at Messer has fallen sharply recently: the company employed a total of 18 trainees in 2018 compared with 34 in 2017. Messer also employed four trainees who are all being trained in Application Technology in Krefeld.

At two Western European subsidiaries, eight trainees completed their training, whose po-

sitions were provisionally not filled pending clarity about the Messer Industries joint venture. At several smaller national subsidiaries, each of which had only one or two trainees, one training position at each location was not filled for local reasons after the trainees had successfully completed their training.

The ongoing training needs of Messer staff are ascertained as part of annual employee performance reviews, with the local HR departments responsible for drawing up and implementing specific plans for further training. In 2018, the average amount spent on training and professional development was 243 euros per employee; in 2017, the figure was 272 euros. The average number of training days per employee was 2.8 compared with 3.4 in 2017. We are running an "English offensive" worldwide to improve English language skills. As part of this offensive, there are three groups at each company catering for different levels of knowledge of the language and providing the opportunity for employees to improve their language qualifications.

Academy Messer Group

As an internal scheme to ensure systematic personnel development, the Academy Messer Group offers a range of training courses covering both technical and professional areas as well as personal skills development. A regular, annual series of events examining current trends is very popular with our local managers and junior executives. The "Focus on Cylinder" transnational training course for cylinder salesmen was continued in 2018, with training provided at the Messer companies in Western Switzerland, the Baltic States, Hungary, Bosnia, Bulgaria and North Macedonia.

A series of seminars again took place for the Junior Circle, our programme for the next generation of managers, with participants from various national companies and spe-

cialist areas. The third Junior Circle group, which has been going through the two-year programme since July 2017, is involved in various projects focusing on the topic of “digitalisation”. For example, they are planning the implementation of a chatbot, investigating the possibilities of optimising cylinder business through digital technology and preparing the introduction of digitally controlled air separation unit maintenance.

Employee orientation and integrity

Financial parity

Our salaries are based on the position, the market, performance, training, experience and seniority and, where applicable, on collective agreements and inflation compensation. Equal treatment of the sexes is taken for granted.

Equal treatment and anti-discrimination

If employees feel discriminated against or that they are not being treated equally, they can, at any time, turn to their local human resources manager or the Group Compliance Manager, who will help deal with the matter and ensure that equality is maintained. The employee may also choose to put this on record during his or her annual appraisal. In such cases, provided it is a minor infringement, the possibility of resolving the problem through mediation or equivalent coaching is discussed in consultation with the parties involved. A serious violation may, however, result in the person who committed the violation having their employment terminated.

In 2018, one case of discrimination was reported at Messer in Romania.

Internal social partnerships

2.8 % of our employees in Europe were members of a works committee in 2018. At most of our Eastern European national subsidiaries, the local management negotiates joint pay agreements with trade unions. The relationship between our workforce and the management is one that is characterised by trust, resulting in not a single strike or anything similar at Messer in 2018.

Digital learning platform

Use of the company’s own e-learning platform was expanded in 2018. The existing platform was presented to other areas in the Messer Group with the intention of also integrating them into the production of in-house e-learning training courses or to get them to use the platform for online training courses sourced externally. Another area of focus was the production of our own, tailor-made e-learning training courses. An e-learning training course on the subject of compliance has been completed and can be rolled out worldwide in future. In the medical sphere, the pharmacovigilance e-learning training course was gradually extended to other national subsidiaries. Further training courses in the Legal, Medical, SHEQ and Human Resources spheres are at the production stage.

Cooperation in networks

Cooperation in supraregional networks is encouraged at Messer. Thus, for example, expert teams meet up regularly to share experience and exchange ideas and information. More often than not, the meetings also feature a talk or presentation by an external specialist.

Corporate Conference 2018

In October 2018, representatives of the management of Messer and the MEC Group met for their annual senior management conference in Shanghai, China. The primary focus was on drawing up a strategy for the coming four years with the main themes being financial independence, growth potential and organisational strength.



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Meeting of helium experts

In March 2018, the helium experts from Messer Group and from the national subsidiaries met for another exchange of experience. This time the topic was "Best practice for avoiding moisture and preventing helium losses in the facility". All the participants contributed ideas.

ASU managers

In April 2018, this year's "ASU Managers' Meeting" took place in Austria. Besides specialist presentations and an exchange of experience, the group also visited the new air separation unit in Gumpoldskirchen on the second day.

Chemistry, Paper and Environment

In May 2018, Messer Group's Application Technology "Chemistry, Paper & Environment" unit organised a workshop with a focus on chemistry at the competence centre in Austria. It involved working together with the national subsidiaries to develop strategies for the further expansion of applications in refining – primarily applications with oxygen, but also inerting and industrial wastewater treatment. A very successful "paper workshop" had already taken place at an earlier date. A workshop on options in the treatment of drinking, process and waste water took place in the autumn of 2018. This series of workshops replaced the usual network meeting.

Application Technology

Application Technology's Industry network meeting took place in June 2018 in the new Competence Centre in Krefeld. This gave participants the opportunity to get an overview of the centre's application technology-related test equipment and evaluate the possibilities for customer tests.

Welding and Cutting

Messer Group's annual "Welding and Cutting" network meetings also deal with current issues. Competitor monitoring, the current status of our "Triple Saver" campaign, 3D printing and digitalisation were on the Western Europe meeting's agenda in June 2018.

Communications

The Messer and MEC ComManagers' network meeting took place in Berlin in June. A total of 30 communications managers from 14 countries covered topics such as image and film rights, cybercrime and the new EU General Data Protection Regulation (GDPR). The meeting also featured training in digital storytelling.

Human Resources

At the Global HR Meeting in September 2018, HR managers from the national subsidiaries discussed the subjects of "data protection" and "cybercrime". A very good understanding of these complex issues was gained thanks to Messer Group's Data Protection Officer. The theme of "cybercrime" was also covered in detail at one of the annual employee meetings.

Global Sales Meeting

Around 45 sales managers from all over the world gathered in Bad Soden in September 2018 for Messer Group's Global Sales Meeting (GSM), a two-day event that is held once a year. Our colleagues from the Western, Central and South-East Europe regions as well as China, Vietnam and ASEAN presented their Best Practices. Central Sales Functions (CSF) presented news, trends and know-how from its different departments. This included new applications and products as well as competitor analyses, segment strategies and e-sales tools.

CO₂ plant managers

Messer's CO₂ plant managers met for the seventh time. This year's meeting took place in November 2018 in the French city of Aix-en-Provence. The participants took advantage of the opportunity to exchange experience and get tips and information on technical issues, new plant components and dealing with the authorities.

Test laboratories

Everyday challenges as well as procedures for future improvements in laboratories were the topic of a meeting of test laboratory staff from Messer, Region South-East Europe and Corporate SHEQ. An intercomparison is intended to increase cooperation between the laboratories in future. At the same time, the idea of setting up a laboratory working group in our South-East Europe region was very well received. It will focus on gathering and exchanging ideas as well as identifying and solving problems.

Employee motivation and integration

At Messer, team building measures are implemented according to the needs and judgement of the national subsidiaries. Most team events in 2018 were of a sporting nature in order to benefit employee health at the same time.

Belgium: Messer Benelux runs the extra miles!

Following Messer's worldwide pedometer competition, Messer Benelux took up a new challenge: on 3 June 2018, a team of colleagues took part in the "Great Breweries Run". The 25-kilometre route through the Flemish countryside led to Belgium's finest breweries.



Employees of Messer Technogas met in the Sudeten Mountains.

Czech Republic: A weekend of cross-country skiing

As part of Messer's "Fit at 120" campaign, employees of Messer Technogas added cross-country skiing to their list of sports activities. More than 20 participants – including experienced skiers and beginners – went cross-country skiing during a weekend together in the Sudeten Mountains. They covered a distance of 20 km in perfect winter weather.

Bosnia-Herzegovina: Strong as a team

As part of the traditional New Year reception at Messer in Bosnia-Herzegovina, the employees at each site took part in a team building event. The participants competed as groups in long jump and running events as well as a game in which the competitors were blindfolded and had to find their way to the centre of a circle guided solely by instructions called out by their colleagues. The

event highlighted the importance of teamwork in achieving good results together and for sharing knowledge and experiences.

Bosnia-Herzegovina: Teamwork on the pitch and in the kitchen

Teamwork is key to business success. And just like with any skill, teamwork requires training. This need not necessarily take place in a work setting – there are other very effective ways of fostering teamwork, such as sports activities or cooking together. For example, Messer BH employees took part in a football tournament organised by one of our customers, GS TMT Travnik. Another team of colleagues entered a cooking contest where they impressed the jury with their culinary skills as well as their Messer-red aprons and chef's hats.

Hungary: Summer outing to Semmering

For the second time now, the team from Messer Szendioxid in Olbő organised a group summer outing: on 2 June 2018, our colleagues visited the world-famous Lindt chocolate factory in Gloggnitz. After that they took the train to the Austrian town of Semmering for a trip along the historic Semmering railway line. This was followed by a relatively easy hike back down to the valley, which saw the group cover a distance of over 13 kilometres or more than 22,000 steps.

Vietnam: Even more successful as a team

Our Vietnamese colleagues meet once a year for the “Messer Haiphong Company Tour”. The 2018 tour saw over 200 employees from five provinces come together in the coastal city of Da Nang. Excursions in

the region around Da Nang, various team building activities and a gala dinner provided an ideal opportunity to interact and get to know one another better. Some of the team building activities took place on My Khe Beach, with all the participants enjoying the creative and exciting games which allowed them to grow even closer as a unit.



The 2018 Messer Haiphong Company Tour saw over 200 employees come together in Vietnam.

Economy and Business

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Economy and Business

Strategic Orientation

Messer acquired the majority of Linde AG's gases business in North America and certain Linde and Praxair business activities in South America with effect from 1 March 2019 in a joint venture – called Messer Industries – with CVC Capital Partners Fund VII ("CVC"). Messer Industries invested a total of around 3.6 billion US dollars (3.2 billion euros). Messer contributed the majority of its Western European companies to the joint venture. With some 5,400 employees, the Linde activities acquired in the USA, Canada, Brazil and Columbia along with Praxair's Chilean operation generated sales of 1.8 billion US dollars (1.6 billion euros) with EBITDA of approximately 408 million US dollars (359 million euros) in 2018.

Messer plans to fully integrate the joint venture into the family-run Messer Group within a few years. In the medium term, we want to use the merger of the two companies to become a global player again with a presence in the relevant industrial gases markets. Financial strength, business strength and organisational strength are the three aspects that Messer wants to work towards. The aim is that the business which Messer – together with financial investor CVC – took over from Linde and Praxair will be fully integrated into the Messer Group in 2022, followed by a buy-out of CVC. New projects, increased margins in existing markets, automation and process improvements are intended to ensure that Messer continues to enjoy strong economic growth. Applications that are successful in Europe will be promoted and implemented in the Asian market and new customer

segments identified. In June 2018, Messer Ibérica in Spain was visited by a 15-member delegation from China. The group consisted of executives from different Chinese Messer companies and representatives of major customers. Messer Ibérica gave them an insight into the company's development and activities in Spain and Portugal, its pipeline business in the Tarragona Chemical Park and the sale of cylinder and liquid gases. The visitors also visited the air separation unit in El Morell. Here they were shown the plant's standard, energy efficiency projects and how pipeline customers are supplied.

The emerging ASEAN region will be run from Thailand in future. Messer will initially focus on the markets in Thailand, Vietnam and Malaysia. In the course of the academic exchange between Frankfurt School of Finance & Management and Messer Group, a high-level delegation of bankers from Myanmar visited us on 23 May 2018. In addition to a brief presentation about our company and a visit to the Messer Museum, the participants also had a face-to-face meeting with Stefan Messer. This highlighted several promising potential opportunities for our company to get involved in Myanmar, which is located in our ASEAN growth region.

New Competence Centre

Messer opened a new international competence centre in Krefeld, Germany, on 6 June 2018. It will serve as a hub for testing gas application technologies in the areas of Food, Industrial Cryogenic Applications, Cutting & Welding, and Chemistry & Environment. The centre offers space for future expansion.

The technical centres for the various segments were previously spread across different sites in a number of countries. They have now been brought together in Krefeld, the control centre for important central functions, including Application Technology. This allows experts from the different segments to share experience based on practical tests and pool their efforts to find new solutions for customers.

The new technical centre's equipment includes a cold grinding facility with complete classification and analysis technology, equipment for cryogenic chilling and freezing of food products, test equipment for transport refrigeration, a unit for high-pressure extraction with supercritical fluids, and welding equipment for all commonly used welding methods. Rooms and facilities are also available for employee and customer training.

A specialised competence centre's function covers the stage between research and development under laboratory conditions on the one hand and industrial application on the other. It serves the purpose of carrying out detailed analysis of technical processes, practical testing of newly developed application technology and working out specific solutions for individual industrial applications, all of which is performed in close cooperation with universities and project partners.



Symbolic inauguration of our new test facilities with Stefan Messer, the guest of honour, Krefeld mayor Gisela Klaer, Adolf Walth and Davor Spoljaric (from left to right).

In the Cutting and Welding segment, the rapid development of laser technology is one of the reasons why cutting and welding gases are having to meet many new requirements. Specific gas mixtures can significantly improve the efficiency and quality of welding processes. This segment also includes additive manufacturing and 3D printing with metal material – processes in which shielding gases are indispensable.

The same applies to the Chemistry and Environment segment, where gases ensure process safety and help preserve product quality. As a rule, this involves preventing oxidation reactions and thereby also containing the risk of fire and explosion. On the other hand, however, oxygen is also used for targeted process optimisation, including in the treatment of drinking water, wastewater and process water.

The Food Industry uses gases on account of their chemical and physical properties. They help extend the shelf life of products by creating a modified atmosphere in the food packaging process (MAP; Modified Atmosphere Packaging); they are also increasingly used as refrigerants both in processing and transportation. In food production, for example, cryogenic gases are used for rapid freezing, surface hardening or as a cold source during various mixing processes. When transporting food products, these gases allow complete truck load compartments or individual insulated containers to be kept at the desired temperature.

Cold Grinding usually involves the use of liquid nitrogen at a temperature of minus 196 degrees Celsius. The cold gas ensures that the material to be ground becomes brittle, thereby facilitating the production of extremely fine powders. The low temperature also counteracts the evaporation of volatile constituents, which is particularly important when grinding spices, in order to keep the flavourings in the product. Another example of an efficient, environmentally friendly application involving the use of liquid nitrogen is the cleaning of waste gas flows by means of condensing and freezing out vaporous substances from process waste gases in the chemical industry, where the condensed vapours can often be reused.

The physicist and Nobel laureate Dr Georg Bednorz, one of the discoverers of high-temperature superconductivity, was a guest of honour at the opening of the technical centre, where he gave a talk on superconductivity as a key technology of the 21st century. Modern high-temperature superconductors lose their electrical resistance when cooled with liquid nitrogen. They have been marketable for energy-related applications for several years now. High-temperature superconducting cables transmit large amounts of electricity without loss, thus enabling the construction of highly efficient power distribution systems in cities and at industrial sites.

Growth through Investment

The foundation for growth is created above all through investment projects. The following are examples of the projects that were initiated or completed in 2018.

Investments in Europe

Romania: Messer acquires BUSE Gaz

Messer bought BUSE Gaz S.R.L. in Romania with effect from 4 May 2018. As part of this investment, Messer took on all 39 employees as well as taking over all fixed assets. In about two years' time, after expansion and modernisation, BUSE's current headquarters in Bucharest will become the new head office of Messer in Romania. The two companies complement each other in terms of their activities and their operational and production structures. With two cylinder gas filling plants – one in Deva and one in Valcea – as well as another filling plant in Bucharest, we are strengthening our geographic configuration and enhancing our product portfolio with liquid CO₂ and dry ice.

Germany: Air separation unit at St. Gobain

Saint-Gobain has decided to heat the new glass tank that is due to be built at its Speyer site in 2019 with natural gas and pure gaseous oxygen. Messer will put up a new air separation unit – its third one in Germany – to provide the customer with a long-term supply at the Speyer site. The unit – a joint investment with an industry partner – will

also produce liquid oxygen, nitrogen and argon to supply customers in the surrounding area, including in neighbouring France and Switzerland. Synergies resulting from the combination of required quantities of gaseous and liquid products will ensure greater economic efficiency for everyone concerned, which was the decisive factor in the bidding contest.

Germany: First hydrogen production facility in Germany

In 2018, Messer signed a 15-year hydrogen supply contract with RÜTGERS Germany, a subsidiary of Rain Carbon Inc. Messer is investing a total of nine million euros in a hydrogen production facility at the site of Rain Carbon Inc. in Castrop-Rauxel. The company will use the hydrogen in the hydrogenation of industrial resins. Messer will also use the facility to supply other hydrogen customers in the region. The facility will produce hydrogen by means of the steam reforming process, using natural gas as the feedstock. It will have a capacity of 2,700 normal cubic metres per hour. That is the equivalent of approximately 15 tankers per day. Start-up of the hydrogen plant – Messer's first in Germany – is planned for the third quarter of 2019.



Opening of the air separation unit in Škofja Loka, Slovenia: Ernst Bode, Johann Ringhofer, Valentin Ilievski, Stefan Messer, Adolf Walth, Bojan Andrejašič and Zoran Wltavsky (left to right)

Slovenia: Messer's first air separator

On 25 May 2018, Messer Slovenija put its first air separation unit into operation at its new Škofja Loka production site. Instead of being supplied by 100 truckloads per week, the biggest customer can now get the necessary industrial gases directly from the facility. Twenty local jobs have been created.

Hungary: Natural CO₂ to meet growing demand

Messer has successfully completed the construction of its third CO₂ production facility in Ölbő. High-purity carbon dioxide is extracted from a local natural source. The source itself lies at a depth of around 2,000 metres. The gas is supplied primarily to the beverage industry in Hungary and in neighbouring countries. To satisfy their rapidly growing demand, original output at the site has now been tripled. Besides extraction from natural

sources, CO₂ is often obtained as a by-product of processes in the chemical industry, after which it is purified. Natural CO₂ has a high level of purity in comparison and can be obtained independently of other industrial processes. The facility in Ölbő is therefore one of the most reliable sources of CO₂ in Europe.

Czech Republic: Investment in Vratimov

In October 2018, MG Odra Gas succeeded in extending its oxygen, nitrogen and argon supply contract with steel manufacturer ArcelorMittal Ostrava for a further ten years until 2030. In order to secure production at the Ostrava steel plant in the long term while at the same time making it more efficient and profitable, we are modernising our air separation unit and liquefaction capacity at the Vratimov site. In addition, this will secure the long-term supply for our existing on-site customers Biocel and OKD.

Investment in Asia

In Dung Quat, Vietnam, Messer is building two air separation units to provide Hoa Phat Steel's new steel plant with a pipeline supply of oxygen, nitrogen and argon. The facilities will go into operation in 2019.



Air separation units under construction in Dung Quat, Vietnam

Strong demand in China led to almost all our Chinese production facilities operating at full capacity in 2018. Expansion projects were initiated at numerous sites to ensure a continued supply for customers in future. Product expansion is also planned in the specialty gases segment. To this end, a new specialty gases plant is being built in Anhui.

Expansion of the electronics industry in China is leading to a high level of demand for on-site facilities to supply high-purity nitrogen. In addition to expanding the nitrogen supply for BOE Optoelectronics Technology in Chengdu, Sichuan Messer also concluded a new contract with Truly and is currently building two gaseous argon generators for Truly's new plant in Sichuan.

Further information on investments can be found in the 2018 Group Management Report of Messer Group GmbH.

Data Protection

On 25 May 2018, two new laws came into force: the EU General Data Protection Regulation (GDPR) and the new version of the German Federal Data Protection Act (BDSG-Neu). A Messer GDPR project team took timely measures to prepare Messer for the new legislation and the date on which it would come into force: since May 2017, the business processes needed to comply with the new legislation had been defined and specified while critical areas and functions had been examined with specific reference to the new provisions.

The new laws give a more important status to data protection in Europe: deadlines have been reduced, penalties increased, documentation requirements significantly extended, with the basic data protection principles remaining unchanged. Data protection essentially concerns personal data. Examples include a person's name, email address, postal address and date of birth, but also their computer's IP address, income, health data and other information that can be used to identify a person. This protection was already a requirement in Germany as well as in many other European Union (EU) countries, but there was no standardised approach. The introduction of the GDPR has now created a binding framework for all EU and EEA countries.

Messer must now be able to prove that we always use our employees', customers' and business partners' data in accordance with the law. Whereas previously it was the responsibility of the authorities to prove that a company committed a possible error, now, in cases of dispute, the company has to prove that effective personal data protection measures were implemented.

Data protection issues concern every workplace, in particular HR, Marketing and Sales. Whenever processes or systems used to process personal data are created or modified, it is necessary to check the data protection settings. This involves recording all the necessary information, defining protection measures and documenting the details in the record of processing activities.

Messer's European national subsidiaries and Messer Group GmbH communicate their data protection notices in the respective national language via their websites. The employees have made the appropriate changes to their email signature in Outlook by adding a link to their national subsidiary's data protection notice (mandatory) and to that of Messer Group GmbH (optional). Companies outside Germany, Austria and Switzerland should provide a link to an English version of their data protection notices. In addition, it was recommended that the data protection notice links of Messer Group and the respective national entity be included in business documents such as contracts, order confirmations, invoices, delivery notes etc.

Digitalisation

Today, information technology permeates virtually every part of a modern company. Digitalisation disciplines such as artificial intelligence, Big Data or the Internet of Things increase the efficiency of production processes, thereby contributing to sustainability and resource conservation, or expand the spectrum of services that we can offer our customers.

The production of air gases is an energy-intensive process. Each additional optimisation of the energy efficiency of the plants involved is accompanied by a considerable savings potential in terms of resources required. In line with the relevance of the topic, we are simultaneously investigating two different approaches to optimising control via intelligent IT systems. One of these projects emerged from the current Junior Circle, with a sub-group of this training scheme also playing a key part in moving it forward.

The two other subgroups of the Junior Circle are analysing the potential for optimising the use of our gas cylinders and developing solutions for improving case-related customer communication. We are seeking to optimise our cylinder stock by, among other things, implementing Big Data analyses based on the data set generated by our BABEL cylinder tracking system. We are making a chatbot available on our websites – initially with limited coverage in terms of regions and content – to provide interactive answers to questions regarding our products. Since the beginning of 2019, we have made it possible for the service engineers at our national subsidiaries to provide our customers with quick and efficient support remotely via the Internet.

To facilitate automated communication of software systems, including between companies, we are making easily integrated interfaces available to our customers, and in future to our suppliers as well, for the electronic transfer of, for example, orders or invoices.

Many of our tank installations have been part of the Internet of Things for 20 years. Now we are taking the next step by equipping the first mobile tanks with technology to transmit the current filling level. Our aim in doing this is to be able to offer these customers an enhanced and optimised supply service too.

IT Security

Nowadays, information technology is found in almost all areas of modern companies. Functions such as Internet, e-mail and ERP are a daily part of our work, supporting communication and operational processes and thereby making a substantial contribution to value creation and efficiency, and thus to sustainability and resource conservation.

We have created the position of Group IT Security Officer at Messer Group in order to centralise control of data security issues relating to IT functions and associated data. The protection objectives place particular emphasis on data confidentiality, availability and integrity.

Within the framework of the newly defined section, we are gradually examining IT-relevant areas and gathering fragmented information centrally with a view to creating a single data security concept in future. We are making an inventory of cloud services already used; this is being done through a newly created organising committee made up of participants from Europe for the time being.

A programme for assessing cloud services was one of the first measures to be initiated. The aim is to give an evaluation and risk assessment in terms of data security and the protection of personal data.

Service providers are contacted via the central contact for IT security with the aim of checking our IT security through penetration tests and thus making the operation of industrial control systems safer.

Sustainable, documented supply chain

A sustainable supply chain is one of the foundations of Messer's economic success. In this regard, a crucial role is played by Messer's relationships with its key suppliers, which are maintained by the Logistics/Sourcing and Engineering/Production departments in their respective areas of expertise. These central departments take charge of or provide assistance with Europe-wide purchasing of logistics services, commodities, merchandise, facilities, machinery, transport equipment and 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 Corporate Production department supports the Messer national subsidiaries in the operation and maintenance of existing production facilities (troubleshooting, maintenance planning, know-how transfer/training, standardisations).

The Engineering department is responsible for all technical and procurement-related aspects in connection with execution of projects for the production of all manner of

gases. These include the development as well as construction or conversion of units for the production of technical and medical gases. In addition to plant design, project management and construction management, these tasks also include procurement/purchasing of all necessary plant components and continue through to commissioning.

Logistics/Sourcing, together with Messer Gaspack, ensures the availability of products (all kinds of gases) for Messer and customers, as well as taking care of transportation of the products. This includes the development and purchase of tankers, stationary customer tanks and vaporisers, the purchase, rental and periodic inspection of gas cylinders, the purchase of electricity for the production facilities and the purchase of gases from external sources. Logistics/Sourcing also supports the national subsidiaries in managing transport contracts and organising the transportation of heavy loads. Dealing with these specialist areas centrally allows economic advantages to be achieved while also ensuring high quality standards across the board.

In 2018, the Logistics/Sourcing department performed a total of six key supplier audits. One of the areas of focus is auditing the manufacturing process and the quality of manufactured products. In this context, key suppliers are now also being questioned on their compliance with the principles of the UN Global Compact.

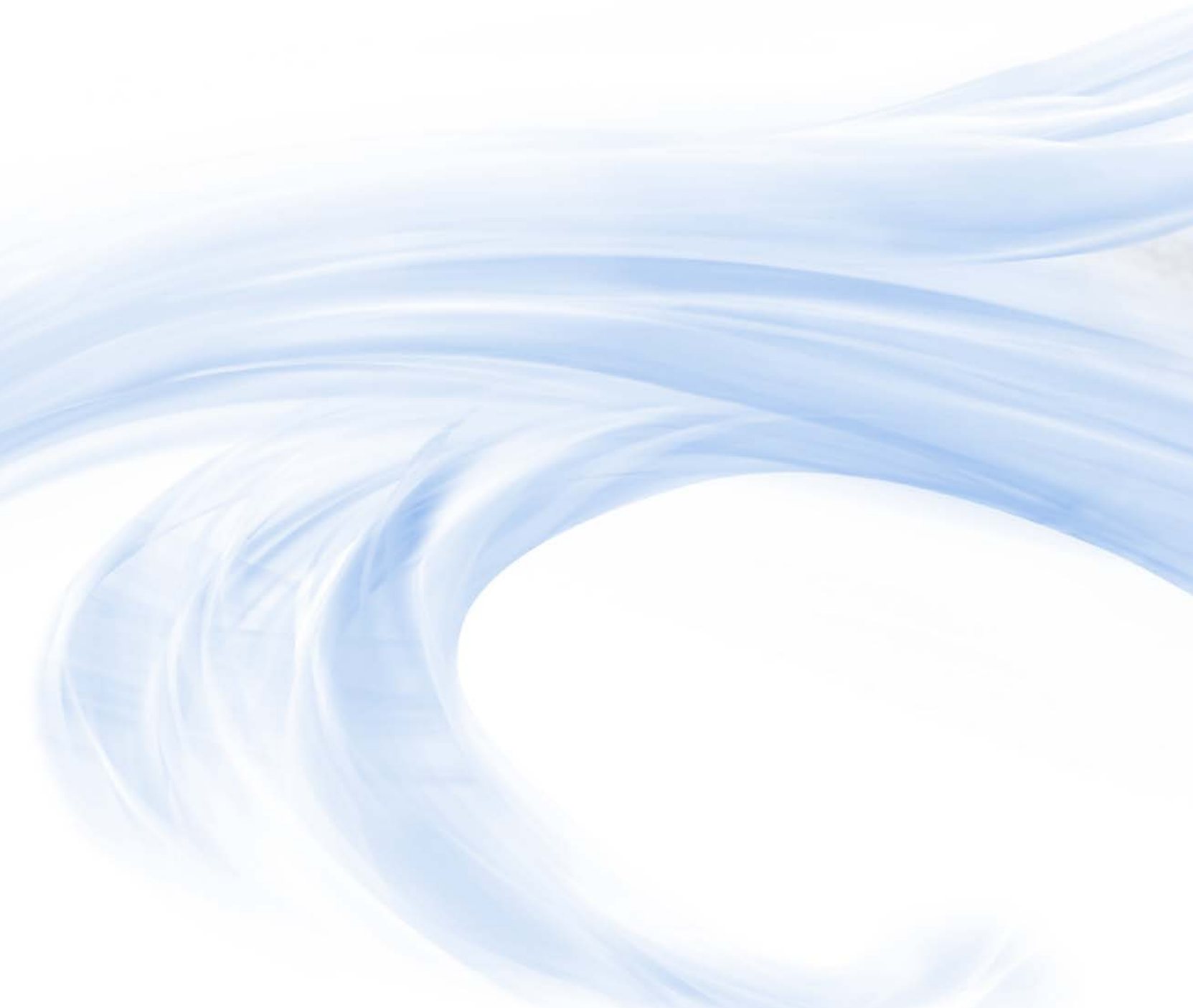
The supplier is assessed in four categories. In the event of an unsatisfactory assessment, measures designed to improve performance are worked out together with the supplier.

In addition to the quality management system (e.g. ISO 9001), other important considerations for a supplier evaluation include compliance with safety standards, the provision and quality of staff training and the inspection of machines used, as well as environmental aspects. In particular, this also involves checking how liquids are used and disposed of in production. For example, as a rule, when checking the pressure of all types of tanks and vessels (tanks, tank trailers, gas cylinders), drinking water is used as a compression medium for safety reasons. Questions regarding its sustainable use are also part of the supplier audit.

The results of the supplier audits in 2018 were very satisfactory. All the suppliers met Messer's requirements, some of them after completing a catalogue of measures.



Safety





Safety

Safety, health and environmental protection (SHE) form an integral part of Messer's activities as a business. Only a universal, well-organised SHE system can ensure sound management of business risks and continuous improvement of operational processes as well as performance in the areas of safety, health and environmental protection. In January 2018, as part of a continuous improvement process, the Management of Messer Group published a new version of the SHE Manual as a binding document within the Messer Compliance Management System (CMS).

Safety – both for us and our customers – when handling gases, safety in the workplace, be it on the shop floor or in the office, 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. In 2018, the new web-based INCA incident management tool was used to record and statistically analyse workplace safety and environmental protection incidents. Although the number of industrial accidents reported with loss of working hours fell slightly, there was an increase in the number of days lost due to the severity of the accidents. The majority of industrial accidents in 2018 occurred during maintenance work. This is one of the reasons why we are focusing on the safety of our suppliers. In future, the companies in the ASEAN region will also be expected to report their incidents via INCA. Our goal is zero accidents. There were no fatalities among Messer's workforce last year.

There were ongoing safety projects in 2018 with the repeat of our annual "Safety Day" as well as the safety campaigns at our national subsidiaries, which are transmitted via large monitors installed in heavily used parts of the buildings such as canteens or recreation rooms. Then there is also the ideas management scheme in the area of safety, which will be revitalised in the future. Every year we give a safety award to the national subsidiaries that have most effectively implemented our safety guidelines in order to encourage our employees to achieve the best possible results. In the area of logistics, we implement internationally recognised safety measures and engage in a continuous exchange of experience with a view to improving our safety performance. In future we also intend to give awards for safe behaviour in the area of logistics. In addition, our logistics safety measures will be supplemented by supplier audits.

Our series of safety pocket guides on handling and transporting our gases – designed for cylinder gas customers – will be further expanded in future.

In the area of operational safety, we have further developed our guidelines and carried out risk analyses on an ongoing basis. We will seek to further strengthen contact and communication between the works managers at our production sites and our central safety management team. At the same time we will make continued efforts to harmonise our plant safety system.

Safety of our employees

The number of industrial accidents reported with loss of working hours fell further from 15 in 2017 to 14 in 2018. The rate of loss of employee working time per million hours worked (accident frequency rate) went down from 1.4 in 2017 to 1.3 in 2018. However, the number of working days lost (industrial accident severity rate) per million hours worked increased significantly from 45.5 in 2017 to 64 in 2018. There were 23 reportable industrial accidents in 2018, a drop of 14 compared with 2017. The frequency rate of reportable industrial accidents per million hours worked decreased from 3.5 to 2.2. Most injuries or illnesses occurred as a result of carelessness, haste, disorder or taking shortcuts rather than being directly linked to our products.

Safety Award and Safety Day 2018

Safety Day information campaigns, the annual Safety Award, regular safety inspections and the sharing of information via newsletters or among members of the workforce help keep employees vigilant, because they are responsible for their health and safety. The Safety Award 2018 was given to Messer Hungarogáz, Hungary, while the runner-up award went to MG Odra Gaz, Czech Republic. Messer held its annual international Safety Day on 14 September 2018. The day's main topic was "defensive driving". Many Messer employees travel to work in their own car or a company vehicle. Commuting accidents were the second most common cause of injuries at Messer in 2018. No regular safety training takes place on the annual Safety Day. The purpose of this day is to promote awareness of the 14 safety rules of the EIGA, the European Industrial Gases Association.

EIGA Safety Awards

Messer received six Safety Awards for exemplary work safety from the European Industrial Gases Association (EIGA) on the occasion of its Summer Session, which was held in Riga, Latvia, in June 2018: Messer Technogas (Czech Republic) was given the Gold Two Star Safety Award for two million hours worked with zero industrial accidents at its Kladno cylinder gas filling plant. Messer Tehnogas (Serbia) was honoured with the Gold Safety Award for 15 years of accident-free operations at its Niš site. Messer Hungarogáz (Hungary) received a Silver Safety Award for 500,000 accident-free man-hours at its Budapest site. Messer France's Saint-Georges-d'Espéranche site (France) and the Messer Tehnogas site in Smederevo (Serbia) were each honoured in the Bronze category for five years with zero industrial accidents. In addition, the European Industrial Gases Association honoured Messer Hungarogáz with the Road Safety Award 2017 for the lowest accident rate in the Cylinder and Bulk Vehicles category, based on an annual driving distance of 500,000 to two million kilometres.

Safety of our customers

In 2018, we operated 8,890 facilities at our customers' sites – 82 more than in the previous year. These facilities underwent a total of 9,395 technical tests. Messer carried out 2,170 safety audits of its own facilities at customers' sites – 588 more than in the previous year. The number of safety training events for customers decreased slightly from 1,590 in 2017 to 1,563 in 2018, but remained at a high level overall. Our safety training events were attended by a total of 5,273 participants, representing an increase of 557 customers.

Web tutorial on safe handling of MegaPack C cylinder bundle

In 2018, a tutorial with step-by-step instructions on how to correctly connect the "MegaPack C" compact cylinder gas bundle was published. The video is available in German and English on Messer's YouTube channel. The tutorial – just under four minutes long – is complemented by information on the specific features of MegaPack C, an interview with an expert and a summary of the bundle's advantages. This video is a continuation of Messer's strategy of providing more service and safety in connection with cylinder gas applications. In 2017, the industrial gases manufacturer had already published four pocket guides on the safe handling and transportation of gases.

Targeted depressurisation

Following a fire in Dillenburg, Germany, the fire brigade had to secure gas cylinders that could no longer be identified. At the fire brigade's training ground, these cylinders were depressurised by a special police unit firing at them. The necessary technical concept was developed by Messer Industriegase. At the end, the cylinders were disposed of properly.

Safety of our logistics and vehicles

The transportation of gases and equipment on the road and customer deliveries are activities which involve the most risks in the gas industry. For this reason, Messer has put its signature to the European Road Safety Charter, thus undertaking to place particular emphasis on transport safety. As well as complying with applicable laws and regulations for operating a vehicle fleet, the Messer Group's own transport safety plan has proved invaluable.

A large proportion of the drivers working for Messer are employed by external transport firms, which are responsible for training the drivers in accordance with the ADR (European Agreement concerning the international carriage of dangerous goods by road). Unfortunately, the number of avoidable accidents in connection with the transportation of our cylinder gases rose from four in 2017 to nine in 2018. Per million kilometres driven, that equates to an increase from 0.17 to 0.41.

The number of avoidable accidents in connection with the transportation of liquid gases also rose slightly from 13 in 2017 to

14 in 2018; the frequency rate per million kilometres driven thus increased from 0.15 in 2017 to 0.19 in 2018.

We aim to reduce the number of accidents by means of appropriate supplier management, load securing and information on defensive driving.

In addition to the transport companies' training materials, Messer has also drawn up its own modular driver training package which is used to train drivers. The main themes covered by the training are:

- Laws and regulations (ADR and national provisions)
- Technical aspects (hazards arising from product, vehicle and tank technology, vehicle checks, safety technology)
- Accident avoidance
- Defensive, economical driving

In addition, all drivers receive a driver manual specific to their work (bulk, cylinders or service vehicles). This ensures that drivers have immediate access to all important information relating to their activities.

In 2018, Messer also tested the introduction of an on-board computer system with a focus on transport safety. The system provides direct optical and acoustic feedback to drivers regarding economical and safe driving so that they can immediately adjust the way they drive. It also allows limit violations and accidents to be evaluated through trip data analysis. Moreover, the data obtained is used to facilitate benchmarking of individual drivers' ways of driving and to aid further driver-specific training in the areas of safety and economy. Following a successful test phase at two national subsidiaries, the system is to be rolled out to the majority of the fleet in 2019.

Furthermore, Messer specialists are actively involved in all relevant EIGA bodies and, to a large extent, in the national associations as well. The findings from the activities conducted within these bodies are incorporated into the driver manual and the driver training scheme on an ongoing basis with a view to enhancing transport safety. In this way, Messer is making its contribution to a steady reduction in the number of transport-related incidents.

Environmental and Climate Protection





Environmental and Climate Protection

Environmental Guidelines

Our SHEQ (Safety, Health, Environment and Quality) guidelines form an integrated standard reflecting Messer's commitment to environmental protection. In addition, Messer adheres to a set of general environmental guidelines.

Messer

- determines the material impact of its business activity on the environment and sets itself substantive goals for the continual improvement of its environmental compatibility
- reduces the undesirable impact of its products and services on the environment
- reduces waste generation and supports pollution prevention programmes
- provides operating principles, processes, procedures and resources for the implementation of its environmental guidelines, taking into consideration the best available technology
- raises awareness among its employees worldwide of the importance to act in an environmentally friendly way, both at work and at home
- complies with or exceeds the requirements of existing environmental legislation
- carries out environmental impact assessments before building new facilities or modifying existing ones
- communicates openly and honestly with all stakeholders and neighbours
- minimises specific energy consumption and, wherever possible, reuses materials in an economically viable way

Environmental Protection through Energy Management

The Messer Group develops and builds its own air separation units. Energy efficiency is a key aspect in terms of their design, as is cost-effective procurement of energy in terms of operating the production facilities.

Messer's objective is to reduce the specific energy consumption of our air separation units by 0.5 % a year from 2010 to 2020. We aim to achieve this through better capacity utilisation of our production facilities, continuous investment in even more efficient facilities and targeted energy efficiency projects. Within the Messer organisation, energy management is the responsibility of the Global Energy Officer (GEO), a position created in 2014. Specific energy consumption was reduced significantly again in 2018, resulting in a saving of 2.8 per cent compared with 2017. This was due to greater capacity utilisation of existing air separation units ("ASU") as well as the elimination of an inefficient ASU in Peru. If the eliminated ASU in Peru is removed from the previous year's figures, the result is a comparable efficiency increase of 1.2 per cent.

Optimising electricity procurement includes Europe-wide calls for tenders, long-term general agreements and continuous monitoring of the futures and spot markets. A central electricity procurement unit at Messer Group GmbH supports and advises our national subsidiaries on buying electricity and carries

out regular checks of their electricity costs as part of a comparative analysis. The use of renewable energy is also checked on a regular basis.

Greenhouse gas emissions

Air separation units process ambient air without producing any toxic or environmentally harmful emissions. Even in the event of a shut-down or fault, only air components are emitted. Our products are gases which are delivered either via pipeline, by tankers to fill customer tanks or in steel cylinders in compressed form. Only cylinder gases are packaged products. Steel cylinders are usually rented out to customers and returned empty after use. They are therefore 100 per cent reusable after the requisite cleaning and inspection; as a rule, they are used over a period of at least 20 years.

Our total greenhouse gas emissions are shown as CO₂ equivalents (CO₂e). Conversion of the quantity of emissions for 2018 has been done per production facility for the first time. The greenhouse gas equivalents have been determined for all European production facilities using the local energy providers' conversion factors on the basis of the year 2017. The International Energy Agency's conversion factors from 2016 were used only for China, Vietnam and the Czech Republic. Our calculation of greenhouse gases is broken down into direct emissions (Scope 1) and indirect emissions (Scope 2 and Scope 3), in accordance with the GHG (Greenhouse Gas) Protocol. Scope 1 includes all direct CO₂ emissions from our production facilities.

Despite efficiency gains, CO₂ emissions are increasing in absolute terms as the number of new production facilities grows and capacity utilisation rises. The reduction in specific

electrical energy consumption as the biggest factor influencing Messer's CO₂ equivalent can be demonstrated using the energy coefficient. Indirect CO₂ emissions represent the generation of purchased electricity (Scope 2).

A total of 5,134 gigawatt hours (GWh) of electricity was used to operate our production facilities. In 2017, the figure was 4,865 GWh. While the disposal of business activities in Peru resulted in a decrease of 86 GWh for ASU operation there, electricity consumption in China increased by 269 GWh. The strong demand for air gases in Vietnam led to electricity consumption there also increasing by 10 GWh. In Europe the total increase came to 77 GWh, particularly in connection with the operation of our facilities in Germany (plus 14 GWh), Serbia (plus 19 GWh) and Hungary (plus 16 GWh). Compared with the previous year, this resulted in greenhouse gases increasing by 177,553 tonnes.

At the same time, greenhouse gas emissions were reduced through the use of green energy in Austria and Switzerland and by updating the greenhouse gas equivalents. The total reduction amounted to 311,906 tonnes. Scope 2 greenhouse gases totalled 3,016,663 tonnes in 2018 compared to 3,151,015 tonnes in 2017.

Indirect emissions that come under Scope 3 include all Group-wide emissions that are not covered by Scope 1 or Scope 2. This includes, for example, the electricity needed for administration buildings or used in connection with travel undertaken by employees. In the Group headquarters and at the subsidiaries in Belgium, the Czech Republic and Hungary, the distance travelled by employees from their place of residence to their place of work and the mode of transport used was ascertained for the first time for the year 2018. The greenhouse gas figures arrived at for the commute yielded a Group-

wide average of 1.6 tonnes per employee. Scope 3 greenhouse gases produced as a result of sourcing industrial gases externally amounted to 176,593 tonnes in 2018. The total CO₂ equivalence value for 2018 was calculated at 199,493 tonnes.

Total CO₂e emissions increased slightly to 3,375,723 tonnes (previous year: 3,361,213 tonnes). The CO₂e coefficient per euro of revenue was reduced significantly and stood at 250 kilograms of CO₂e in 2018. On the one hand, Messer Group achieved a marked increase in revenue, on the other, greenhouse gases were significantly reduced by the modified conversion factors per production facility.

Fuel consumption and other emissions

Diesel consumption by our bulk and cylinder fleet stood at 30.2 million litres in 2018. In 2017, the figure was 29.6 million litres. In 2018, our fleet travelled 97.2 million kilometres in total, compared to 95.7 million kilometres in 2017. The marked increase in kilometres travelled is due to the strong demand for liquid gases in China, Vietnam and Poland. Average diesel consumption went up slightly from 0.309 litres per kilometre in 2017 to 0.310 litres per kilometre in 2018, an increase of 0.3 per cent.

Messer operates nitrous oxide (N₂O) production facilities in Croatia, the Czech Republic, Serbia and China. This gas is used in medicine and in the electronics and food industries. In Switzerland and China, Messer operates a total of six hydrogen plants. In its gaseous state, hydrogen can be used in many industry segments, including as a food additive, in heat treatment processes, as an energy source or even as a fuel.

The total CO₂ equivalent for our fleet's fuel consumption and for emissions of N₂O and hydrogen (Scope 1) is 159,567 tonnes of CO₂e. In 2017, we emitted 141,839 tonnes of CO₂e.

Water consumption

In 2018, our air separation units consumed a total of 9.3 million cubic metres of water, with most of it being used for cooling the compressors in the air separation units. Compared with the previous year, this is an increase of 1.3 million cubic metres, brought about mainly by the commissioning of new plants.

The main production processes used at Messer – air separation, CO₂ purification and liquefaction – require no direct addition of water during the process, for example as a solvent. Accordingly, no requirement for process water exists.

A large amount of heat is generated during these processes, however, essentially as a result of compression of the media. This heat is usually shunted away by means of a cooling water system.

Most units make use of an open cooling circuit. Here, cooling water is circulated, absorbing the heat from the respective sources and returning it to the atmosphere in an open cooling tower. A characteristic of the open cooling tower is that a portion of the circulating water evaporates and a further portion is removed in order to prevent thickening of insoluble components, the sludge. The sum of evaporation losses and the amount of sludge must be reintroduced to the system as fresh water. This added water is the only direct water consumption in the production processes. The amount of additional water is directly dependent on the power consumption of the unit it serves and stands at

around two to three cubic metres per hour per megawatt of electrical output.

Waste generation

The total amount of non-toxic waste was 24,707 tonnes in 2018. The total amount of hazardous waste was 496 tonnes.

Certification of energy management systems

Our commitment to environmental protection is also reflected in our Quality Management System, which is used by Messer worldwide. We are ISO 14001-certified in 23 consolidated companies.

Environmental protection at our customers' sites

Reducing greenhouse gases through efficient use of industrial gases

Our gases also help to make our customers' products and processes more environmentally friendly. In 2018, we carried out 242 new installations of tank systems for our customers, providing them with a supply of our gases for environmentally friendly processes. In the previous year, the number of tank installations was 253. But the sustainability of processes is also being boosted with the help of our pipeline and cylinder gases.

The use of industrial gases helps our customers to reduce their own greenhouse gas emissions. For example, thanks to the recovery of gaseous or vaporous pollutants with our DuoCondex process, approximately 1,000 tonnes fewer substances that are harmful to the ozone layer are released into

the atmosphere. The use of industrial gases also reduces our customers' greenhouse gas emissions in other areas of application technology. In 2019, the Messer Group will ascertain this reduction potential for all environmentally relevant processes. We assume that the potential for reducing greenhouse gases at our customers' sites will be significantly greater than the amount of greenhouse gases produced in connection with the manufacture of our industrial gases.

Solvent recovery

Many industrial processes produce gaseous or vaporous pollutants. They can be condensed – and thus liquefied and captured – by means of cooling with cryogenic liquefied nitrogen. This prevents them from getting into the atmosphere. Messer has developed the DuoCondex process for this purpose, which makes such condensation possible at temperatures as low as minus 160 °C. In most cases, the recovery rate is over 99.9 per cent. Ideally, the condensate that is produced can be reused in production. Some of the recovered substances are also processed, used as fuel or eliminated in a controlled way.

Among other things, this technology is used in the recycling of more than a million refrigerators a year. In this process, the propellants (CFCs) bound in the insulating foam of the appliances are released, then liquefied in the DuoCondex units and rendered harmless. The DuoCondex process is also used by companies in the chemical industry. It helps them comply with emission limits while at the same time saving costs by reusing the condensed substances. The main beneficiary is the environment: in 2018 alone, a greenhouse gas reduction of 500,000 tonnes of CO₂ equivalent was made possible by the successful use of the DuoCondex process.

Germany: Energy balance improved by EcoVap

Messer won the tender to supply nitrogen to special printing specialist Constantia Flexibles in competition with the previous supplier. The factors that swung the customer's decision in Messer's favour included the provision of expert advice as well as an energy-saving gas supply concept. The liquid nitrogen is vaporised with the EcoVap process. This involves the nitrogen's inherent cold being fed into the existing cooling system; as a result the refrigerating machine's electricity consumption is reduced. This improves the company's energy balance and reduces CO₂ emissions. The nitrogen is used to inert the drying process in UV-cured printing machines. It displaces the atmospheric oxygen that would disrupt the curing of synthetic paints by polymerisation. Constantia Flexibles is the world's fourth-largest manufacturer of flexible packaging solutions for the food and pharmaceutical sectors.

Switzerland: Dry ice for clean recycling

End-of-life steel elements from the structural and civil engineering sectors are a valuable raw material. Before the material can be melted down for recycling, any surface impurities such as paints or lacquers must be removed. PSB Umweltservice, a company based in the town of Stockach, carries out this kind of cleaning work in a controlled atmosphere using dry ice blasting machines from ASCO. This ensures an efficient and environmentally friendly process. No additional detergents are required, and there are no chemicals or contaminated wastewater to dispose of.

Hungary: E-bikes on the move thanks to Hungarian experts

E-bikes are clearly a big thing at the moment. From electric leisure bikes to sporty e-mountain bikes to useful cargo bikes, there are now models available for every need. For the city of the future, they also offer an environmentally friendly alternative for daily commutes, local journeys or parcel services. One of Bosch's Hungarian plants, in Miskolc, makes electric drives for such bikes and exports them to 70 different bicycle manufacturers around the world. When soldering the components for the latest generation of e-drives, nitrogen provides the necessary inert atmosphere.



Photo: Bosch

Environmental and nature protection

Vietnam: World Environment Day

On 26 May 2018, Messer Haiphong celebrated "World Environment Day" together with Hiep-Son Primary School. Over 700 pupils and teachers took part in the event, which had "Tackling plastic waste together" as its motto. In addition to exciting performances, the students took part in waste sorting games as well as poster campaigns and presentations on the subject of environmental protection. The aim was to raise awareness of environmental issues and foster a shared commitment to environmental protection.

RhineCleanUp Day

Some 1,000,000 kilogram of waste flows into the seas via the Rhine every year. The river is 1,232.7 kilometres long and flows from Switzerland through Germany and the Netherlands before emptying into the North

Sea. This year's RhineCleanUp Day on 15 September 2018 saw Messer colleagues and 150 Krefeld citizens join forces to clean up the banks of the Rhine. Messer was the initiator of the RhineCleanUp Day in Krefeld; altogether, over 10,000 people in 59 towns across the three countries took advantage of the river's low water level in late summer to clean up its banks.

Earth Hour 2018: Messer turns off the lights for the environment

On 24 March 2018, Messer turned off the lights for an hour at 8:30 p.m. at all its sites in Germany – Bad Soden, Krefeld, Salzgitter and Siegen. With this measure Messer participated in Earth Hour 2018.

Earth Hour is a global movement for climate and environmental protection. It was started in Australia in 2007. Since then, private premises, public buildings and even landmarks have been switching off their lights for an hour each year. The aim of Earth Hour is to raise public awareness about climate protection.



Customers and Markets





Customers and Markets

Messer's sales division is geared to the needs of customers. Customers with modest gas requirements are frequently looked after by local sales partners, while deeper partnerships are developed with medium-sized customers who are looked after personally by our local sales departments. International customers, who tend to have complex needs and requirements that span several countries and an international approach to purchasing and/or production technology, are supported by an international Key Account Management Team. Apart from anything else, this allows us to fully exploit the associated business development potential.

In 2018, a total of over 800 new contracts were signed for the supply of liquid gases, representing annual sales of approximately 42 million euros. This is a good basis for sustained growth. A major contribution came from our China business. Our approach in China is to focus on customers in those regions where we already have operations and where we operate air separation units that allow us to provide our customers with a sustainable and flexible product supply. Sales of cylinder gases have increased as well, making a correspondingly large contribution to the overall result. We have also further diversified our product portfolio in China and successfully expanded it by adding specialty gases as well as nitrous oxide and carbon dioxide among other things.

In the medical gases segment, we will exclusively supply Europe's second largest manufacturer of lung function measuring devices with medical gases in future. The company is based in Germany and operates in over ten

countries in Europe and Asia. The gas mixtures for the customer's European market are produced in Belgium, while production for the Chinese market is based in China. We expect this partnership to be one of mutual support in sales, service and maintenance coupled with an exchange of information about marketing activities. Marketing authorisation for the products that will be supplied is expected by 2021.

We also expanded our business in the area of NO mixtures in 2018 and made preparations to enter the beauty and wellness segment as a newcomer.

Customer satisfaction

Taking our customers' opinions and satisfaction into consideration is part and parcel of how we see ourselves as a responsible company. Our claim is enshrined in our guidelines, which apply across the entire group: We are focused on the individual requirements of our customers and help them to improve their competitiveness and their performance.

Customer satisfaction surveys

We carry out systematic surveys to measure customer satisfaction at all our locations in Europe and integrate the results into our management processes. Measuring customer satisfaction allows the quality and perception of services provided to be monitored and the effectiveness of measures carried out to be assessed. This enables us to continually raise the level of customer satisfaction and thus also improve the long-term commercial success of Messer.

In total, customer satisfaction surveys were carried out at nine European companies in 2018. More than 19,000 customers were contacted at the Messer entities in France, Belgium, Bosnia-Herzegovina, North Macedonia, Germany, Switzerland, Slovenia, Spain and Hungary. That represents an increase of 34 % over the previous year. The proportion of customers who completed the questionnaire in full increased to 8.0 % compared with the previous year (6.2 %). The responses of exactly 1,522 customers were analysed.

The results for overall satisfaction are only partially comparable with one another as the mentality differs from country to country when it comes to assessing satisfaction. By performing analyses of customer satisfaction on a regular basis, we can observe trends in satisfaction within any given country and monitor their development over longer periods of time. Customer satisfaction analyses are repeated every two years in the European national subsidiaries.

The online customer satisfaction questionnaire includes questions regarding overall satisfaction as well as various questions regarding services in the area of sales, logistics, technical service, internal sales, safety and complaints handling. Altogether, the questions and analysis cover up to 24 services.

The results are summarised by region. Messer's overall performance in Western Europe was given a total rating of 8.00 (previous year: 7.4) on a scale of 1 for very dissatisfied to 10 for extremely satisfied, while the average rating achieved in Eastern Europe was 8.6 (previous year: 9.0). The satisfaction rate, which is based on the ratio of satisfied customers to the total number of responses, dropped in Europe from 92.3 % in 2017 to 88.9 % in 2018. This was the case in both Western Europe, where the satisfaction rate fell from 89.4 % in 2017 to 86.5 % in 2018,

and in Eastern Europe, where it dropped slightly from 93.6 % in 2017 to 92.1 % in 2018. Overall, the result is still at a highly positive level. Potential areas for improvement were identified for the individual countries and appropriate measures implemented.

Customer satisfaction surveys in gas centres

A large proportion of our cylinder business is conducted through gas centres in Europe. Gas centres are independent companies that sell industrial gases to our customers on our behalf within defined regions. Messer cooperates with over 1,000 gas centres in Europe. Cooperation with them is very important as it is the gas centres that maintain direct contact with our customers in their respective regions. Direct customer satisfaction analysis has therefore been expanded to include measurement of the satisfaction rate between the Messer companies and the regional gas centres.

This survey has been conducted in Spain for several years and was carried out in France for the first time in 2017. In 2018, the surveys were launched in Slovakia, the Czech Republic, Poland, Switzerland and Austria for the first time. A total of 468 gas centres were contacted, with 182 of them completing the questionnaire in full. Compared with 2017, this represents a 300 % increase in terms of questionnaires analysed.

The online questionnaire – similar to the one for customers – includes questions regarding overall satisfaction as well as questions regarding services provided by different departments, such as gas centre support, logistics, internal sales, IT support, safety and complaint handling. The questions can cover up to 21 services.

The overall gas centre satisfaction rate was 76.4 %. In 2017, the two companies in France and Spain achieved overall satisfaction of 79.1 %. The slight deterioration in 2018 was mainly due to insufficient availability of gas cylinders and bundles in Spain and Poland, which was criticised by the gas centres. This has now been resolved through new investment.

Digital customer service

Clear functionality and operation are particularly important when designing and developing E-Services for customers. As in everyday working life, excellent service is geared to the needs of customers. We have therefore de-

signed and refined a range of electronic helpers based on numerous customer surveys. We are making them available for electronic data interchange (EDI) in the form of apps, on our website and via the data interface of the Messer planning systems.

E-Order

Online ordering is popular and successful because it provides customers with a convenient, straightforward and quick way of performing traditional purchasing tasks. Messer's E-Order service offers customers the online option for repeat orders. Simply select the product and quantity and place the order electronically. This can also be done via the E-Order app, anytime and anywhere, for instance during a works tour or on site.



E-Invoice

We see it as our duty as a company to act in accordance with the principle of sustainability. Our E-Invoice is sent environmentally friendly via email, besides which customers have access to their personal invoice portal via a personalised web page. Invoices can be imported directly into the customer's ERP system in XML format. They also have the option of accessing electronic order confirmations, delivery notes or rental evidence.

E-Connect

Our EDI solutions involve our ERP system corresponding with those of our customers and dealing with the "paperwork". The processes and data formats are defined once only, after which the systems automatically exchange orders and delivery notes, invoices and payment instructions, as well as quality certificates and many other documents between each other.

E-Stock

If a Messer gas cylinder has its own barcode, it is scanned at the time of filling, delivery, return and quality control. E-Stock makes this data available to our customers as individual figures or in the form of statistics. That means they know the precise current status of every single cylinder in stock.

E-ccts

The barcode on each gas cylinder offers even more advantages: E-ccts (Customer Cylinder Tracking System) also allows our customers to track the movements of ordered cylinders within their company. In this way they can be sure of complying with legal requirements.

E-Monitor

Manufacturing companies that use gases in the manufacture of their products need to monitor the fill level of gas tanks. E-Monitor also provides answers to questions regarding the current stock of Messer gases, when the tanks were filled and whether gas consumption is continuous. Our customers get the information online as individual figures and in the form of statistics – with the option of text message notification if they so wish – in order to avoid supply bottlenecks.

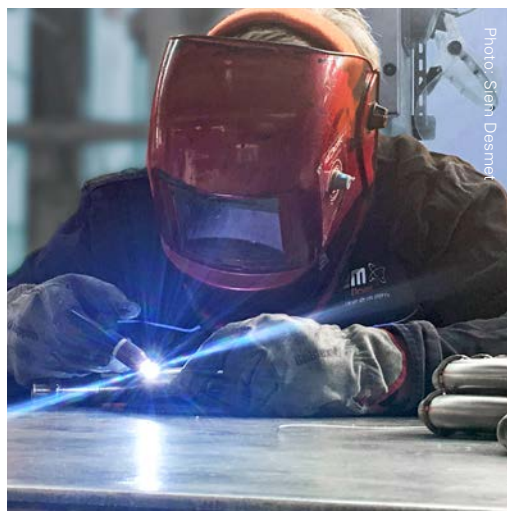
myLab

myLab is Messer's customer portal designed to help our customers manage their lab gas stocks. Certificates and safety data sheets for individual gas mixtures as well as specifications for standard gases can be easily downloaded or managed online. It is clear at a glance which of the calibration gases' stability period will expire soon or has already expired. They can then be easily reordered with one click.

Selected Projects with our Gases in Cylinders

France and Belgium: Calibration gases for determining calorific value

GRTgaz operates the longest high-pressure natural gas transmission networks in Europe, with 32,414 kilometres of pipes. The composition of natural gas, which is a mixture of alkanes and inert compounds, may vary on an hourly basis depending on its origins. Hence, its Gross Calorific Value (GCV) varies as well. As GCV is used for billing along with the volume of gas delivered, GRTgaz uses gas chromatographs at control points to accurately determine it. Calibration gases from Messer are used to calibrate these analysers. These gases are produced in the Messer specialty gas laboratory in Zwijndrecht, Belgium. Messer also provides high purity operating gases, mainly helium, for the functioning of these chromatographs.



Triple Saver

France: Triple Saver for Inox sheets

Siem Desmet, the industrial installation specialist and machine builder located in Lambersart, northern France, has been using the ternary mixture Inoxline He3 H1 from Messer since 2018 following successful tests performed under operating conditions.

It is used for welding stainless steel sheets. The Triple Saver mixture allows for narrower welds with deep penetration, and thus less distortion as well as a finely rippled weld surface that requires little rework.

Portugal: Specialty gases for test laboratory

Messer in Portugal added specialty gases to its product range in 2018. The main customer for this product group is the accredited SondarLab test laboratory in Aveiro. One of the organisations the lab works with is the Portuguese Institute for Welding and Quality (Instituto de Soldadura e Qualidade). Other key areas of SondarLab's work include emission control at industrial facilities in various sectors as well as calibration of measuring instruments at air quality monitoring stations.



Fully automatic filling of pressure cans

Switzerland: Maturing cheese with the help of robots

Cheese doesn't just mature all by itself without having to do anything. Cheese care involves, among other things, regular brushing, turning and washing. In many cheese dairies, this work is performed by robots



Maturing cheese with the help of robots

supplied by Swiss machine building company JNJ Automation based in Romont. They can treat cheese wheels with a diameter of up to 75 centimetres and are also capable of retrieving them from shelves at a height of up to six metres. At the same time, they have to be resistant to the humid, salty atmosphere in the maturing rooms. Their build quality has to meet similarly high standards. The machine body is made of stainless steel and the frame welded manually. JNJ uses the inert welding gases Inoxline He3 H1 and Inoxline H5 from Messer.

Slovakia: Leader in ventilation technology

Messer supplies Technov in Rumanová with liquid nitrogen in a cryogenic tank as well as oxygen 3.5 and welding gases for the production of ventilation and air conditioning systems, which have seen a massive boom in demand in recent years. Technov, one of the leading suppliers in Europe, possesses the hygiene certificate issued by the ILH air hygiene institute in Berlin. The construction of a new production facility in 2018 created more space for state-of-the-art laser cutting technology.

Slovenia: First laser welding robot in Slovenia

Klas Metal d.o.o. has installed Slovenia's first laser welding robot in Kamnik. The machine, a Trumpf TruLaser Robot 5020, uses Messer's Argon 5.0 shielding gas. Laser welding of thin sheet metal produces at least the level of quality associated with TIG welding combined with greatly enhanced capacity. Klas Metal d.o.o. uses the machine to weld high- and low-alloy steel, aluminium and titanium sheet metal. The laser welding facility significantly increases productivity.

Romania: Calibration gases for sensors

Sensor manufacturer Testo gets the calibration gases for its measurement laboratory in Cluj-Napoca from Messer. The laboratory, opened in 2018, has been authorised by Romania's metrology authority. It complies with the requirements laid down in the ISO 17025 standard. Messer supplies the laboratory with high purity gases as well as defined gas mixtures, and has also equipped it with the necessary pressure control equipment. Testo operates worldwide as a supplier of measuring instruments. The company's headquarters are located in Lenzkirch in Germany's Black Forest.



Calibration in Testo's measurement laboratory

Bosnia-Herzegovina: Stopping wind turbines with nitrogen

Pozor-based energy supplier Solik uses nitrogen from Messer to stop its wind turbines during stormy weather in order to protect them. The pressure of the gas provides the energy for the pneumatic rotor brakes. Such brakes are also common in HGVs, the difference being that they are operated with compressed air from a compressor. However, it would be too costly to install a compressor inside the nacelles as it is very rarely necessary to stop wind turbines. The cylinder-stored nitrogen performs the function of the compressor.



Photo: UlrichFoto.de

Bosnia-Herzegovina: Welding gases for storage equipment

In 2018, Messer gained the Ferretto Group as a new customer for welding gases. The company's production site in Usora has also been equipped with a gas supply system featuring 50 welding stations. Ferretto is a leading Italian supplier of storage and intralogistics systems. Ferretto plans to expand production significantly at its Usora site.

Serbia: Welding gases for metal hoses

Turkish business Flex Academy operates automatic welding systems for the manufacture of metal hoses, hollow profiles, steel tubes and moulded parts. At the beginning of 2018, Flex Academy opened a new facility in the Serbian town of Priboj. Messer is supplying argon, oxygen, acetylene and the Innoxline H5 and H1 gas mixtures in MegaPack C6 bundles as well as liquid and gaseous nitrogen.

Albania: Longer shelf life for sweet pastries

Lika gets the Gourmet A70 gas mixture from Messer for packaging its products. The company produces traditional sweet pastries in the capital Tirana and is one of the country's market leaders in this sector. Lika wanted to prolong the shelf life of its products, so it turned to Messer. In a series of tests with different Gourmet gases, the best results were achieved with Gourmet A70, which consists of 70 per cent argon and 30 per cent carbon dioxide. Thanks to modified atmosphere packaging (MAP), the shelf life of the products was increased from five to more than 28 days at a storage temperature of four to seven degrees Celsius.

Albania: Aromatic atmosphere

A vacuum robs garlic of its aroma. Vacuum packaging therefore isn't really suitable for the aromatic cloves, as the Albanian company Orgagro discovered. It specialises in growing and selling garlic for the European market. In 2018, Orgagro approached Messer looking for a flavour-protecting transport packaging solution. A series of tests established that the food gas Gourmet N provides the best protective atmosphere. Surrounded by pure nitrogen, the garlic lost none of its unique aroma even after two and a half months.

Vietnam: Sales offensive for food gases

The Application Technology specialists at Messer Haiphong demonstrated the advantages of modified atmosphere packaging of food. The customer demonstrations involving the use of our "Gourmet" gases took place in July 2018 and were carried out in cooperation with Rynan Agrifoods at their facility. The sales campaign also involved visiting numerous other customers. The offensive was rounded off by a seminar on gas applications in the food industry, which was held at our headquarters in Hanoi.

Gases and Applications for Industry Sectors**Luxembourg: Nitrogen generator for Goodyear**

Goodyear uses nitrogen in the manufacture of truck tyres. Expanded production led to increased liquid nitrogen requirements, which the existing nitrogen generator could no longer cover. We suggested producing the additional nitrogen on site as well since the energy costs are very low in Luxembourg – and our proposal met with Goodyear's approval. We supplied our customer with liquid nitrogen deliveries until the new CryoGAN facility – Messer's first in Benelux – went into operation in September 2018.

France: Complete solutions for supercritical fluid extraction

In April 2018, Messer France took part in the "International Symposium on Supercritical Fluids" for the first time in order to offer complete solutions to potential customers in different sectors (food, cosmetics, pharmaceuticals). Supercritical fluid extraction (SFE) with the aid of CO₂ is an effective, environmentally friendly way of separating components of a material, such as essential oils, without losing its properties. In its supercritical state, CO₂ behaves like an organic solvent, and for this reason it is frequently used for extraction.

Spain: Nitrogen for inerting silos

Ashland Chemical is an American multinational chemical company with a global presence. In Benicarló, in the north of the autonomous community of Valencia, situated right on the Mediterranean coast, the company operates a facility for the production of unsaturated polyester resins and vinyl ester resins. These resins are used as raw material for the polymer industry, with a wide variety of applications across different



Ashland Chemical in Benicarló, Spain

sectors, from the automotive industry, transport, energy and construction to shipbuilding and the chemical industry. For a year now, Ashland has been supplied with liquid nitrogen from the Messer plant 130 kilometres away. The gas is used to inert the process reactors and storage tanks in order to prevent polymerisation of the products.

Germany: Economical nitrogen compression

In 2018, Messer began supplying liquid nitrogen to Koblenz-based firm Stabilus, one of the world's leading suppliers of gas springs and dampers. Regular deliveries have replaced a now-dismantled on-site facility for the production of gaseous nitrogen. Stabilus fills its gas springs with the gas, compressed up to 380 bar, from a ring network. The process of compressing the gas previously involved the use of powerful compressors – with correspondingly high energy consumption and large amounts of waste heat. The liquid gas being used now can be com-

pressed by a pump prior to vaporisation. This is technically more straightforward and less energy-intensive. Electricity consumption is decreased, and maintenance costs are also expected to be reduced significantly.

Switzerland: Liquid nitrogen supply

Messer installed a liquid nitrogen supply for A. Späni AG in Raron in 2018. Späni is a specialist in uncut metalworking and already procures the cylinder gases Innoxline He3 H1, forming gas, welding argon, oxygen and nitrogen from Messer. They are needed for, among other things, tungsten inert gas welding (TIG), gas metal arc welding (MIG/MAG), AC/DC welding, robot welding and longitudinal seam welding. Sheet metal and tubular constructions made of any alloy are welded with the aid of robots at Späni. The firm also runs a Messer gas depot where other customers can collect their cylinder gases.

Poland: Drinking water treatment with ozone

Zakład Wodociągów Północnego is the newest of three waterworks that supply drinking water to the Polish capital Warsaw. The last time it was modernised, in 2017, it received two new ozone generators. They both have a nominal capacity of ten kilograms of ozone per hour and are supplied with pure oxygen from Messer Polska. The acquisition of this customer represents a notable success for our Polish colleagues: Messer Polska currently has contracts with all the ozone-based drinking water treatment plants in Poland.

Czech Republic: More tomatoes with carbon dioxide

Carbon dioxide from Messer helps ensure a rich tomato harvest at Agro Maryša, horticultural growers in Velké Němčice. In 2018, the

business commissioned a 4.5-hectare greenhouse in which the plants are cultivated using state-of-the-art hydroponics. Large quantities of the red fruit can be harvested nine months of the year thanks in no small measure to the CO₂ that is added to the greenhouse atmosphere as a plant nutrient. The greenhouse was put up by NWT, a technology company based in Zlín.

Czech Republic: Oxygen for African catfish

In the autumn of 2017, the agricultural company Mžany started operation of a modern aquaculture system featuring recirculating technology for fish farming at a disused cow farm in Stračov. Mžany is using it to farm African catfish, a species particularly well suited for aquaculture. In 2018, the water was continuously enriched with pure oxygen from Messer in order to create optimal living



conditions for the fish. The fish-farming technology used for this purpose was developed in the Czech Republic.

Slovakia: Welding for grape harvesting

Pellenc, a manufacturer of agricultural machinery and electric hand tools, uses Messer's Ferroline C8, welding argon and nitrogen for metal processing. The gases are used in the production of grape harvester components in Nové Mesto nad Váhom. In 2018, Messer installed a 20-tonne nitrogen tank at the Slovakian site, which has a production area of around 11,000 square metres and a workforce that includes 70 welders. The factory, which belongs to France's Pellenc Group, also has two laser cutting machines.

Hungary: Third nitrogen generator for carbon fibre production

Leading carbon fibre manufacturer Zoltek, part of the Japanese chemical group Toray Industries, is significantly expanding production: in Nyergesújfalu, Europe's largest carbon fibre production centre is undergoing expansion. The customer ordered a nitrogen generator from Messer Hungarogáz to cope with the increased production levels. This means that, together with the generators that have been in use for 20 years, we now operate a total of three nitrogen generators at the Zoltek Companies site.

Hungary: Fourth on-site generator

Robert Bosch Elektronika Kft. produces state-of-the-art electronic vehicle systems for the automotive industry. Since 1999, the company has been using high-purity nitrogen from Messer Hungarogáz for soldering, which also optimises the storage of moisture-sensitive components, thereby helping to maximise production quality. In 2006, we installed the first nitrogen generator, and with production constantly increasing, the second one was put into operation in 2008, followed by the



third one in 2013. In March 2018, we received an order for a fourth on-site generator.

Bosnia-Herzegovina: Nitrogen for blast furnace overhaul

In 2018, following a three-month preparation phase, Messer Tehnoplina successfully completed its project work for the complete overhaul of an ArcelorMittal blast furnace at the Zenica site. In order to make sure that it was safe to work inside the furnace, the blast furnace gases were first removed with the aid of nitrogen. Over a period of four days, Messer delivered liquid nitrogen for inerting as part of this complex process.

Serbia: Know-how and gases supported battery production

In just two weeks Messer Tehnogas engineers completely rebuilt the entire oxygen supply network and installed the necessary measuring and control equipment for the oxyfuel burner system for Batagon Energy, a battery production plant in the Serbian town of Sombor. All the hard work was rewarded with a long-term liquid oxygen supply contract signed in 2018.

Serbia: Everything for cutting and welding

Messer has delivered a cutting machine to Alfa Technics and installed a gas supply system for welding high and low alloy steels at the metal-processing company's new production facility in Svilajnac. In addition, an

agreement has been signed regarding regular deliveries of liquid argon.

The cutting machine – an OmniMat 6000 – features a 400-amp plasma torch for bevel cutting, an ALFA oxyfuel torch, a marking tool and a drilling unit with a changer magazine. The gas supply system has more than a hundred withdrawal points. Alfa Technics' product range includes conveyor systems and assembly lines for the automotive industry.

Serbia: A new nitrogen application

Messer has installed a pipeline over 1,000 metres in length to provide a direct nitrogen supply to HBIS Group Serbia's steelworks in Smederevo in future. The gas is used to remove rolling emulsion in the cold-rolling mill. The emulsion consists of a mixture of lubricating oil and water and reduces friction between the roller and the steel strip. It also has a cooling function, thereby protecting the surface of both the rollers and the sheet steel. The nitrogen blows it off the surfaces with a pressure of 7.5 bar, at the same time preventing unwanted oxidation. The nitrogen is produced as a by-product in two Messer air separation units located in the immediate vicinity, which already supply the steelworks with oxygen.

Serbia: Concrete cooling with liquid nitrogen

Messer supplies construction company Karin Komerc in Novi Sad with liquid nitrogen for concrete cooling. The building material is cooled directly in the concrete mixer during production – a first in Serbia. The process, which is primarily used for smaller quantities of concrete, was extensively tested beforehand.

Vietnam: Protective gases for meat

In 2018, meat products manufacturer Nhat Nguyen in Hưng Yên became one of the first companies in Vietnam to package pork using the modified atmosphere packaging (MAP)

method. Messer advised the company during installation of the packaging machine, installed the gas supply and now supplies the necessary food-grade. Nhat Nguyen wants to use MAP to extend shelf life, improve product presentation and achieve greater packaging flexibility. The company also intends to use MAP technology for beef products in future. Messer in Vietnam is currently testing MAP processes for bread and fruit packaging for other companies.

Vietnam: Liquid gases for steel production

Messer supplies steel producer Toàn Thắng Steel with large quantities of liquid nitrogen and oxygen under long-term supply contracts. Market analyses forecast strong growth in steel consumption in the ASEAN states, primarily due to the region's increasing urbanisation. Toàn Thắng Steel is responding to this increasing demand by switching from the electric arc process to the Linz-Donawitz process, which allows large quantities of steel to be produced economically. This process is also known as basic oxygen steelmaking because it involves pure oxygen being injected directly into the molten pig iron with a lance, resulting in removal of the dissolved carbon.

Thailand: Cold cement for mobile tower factory

International construction company Max Bögl uses a cement cooling technique developed jointly with Messer in the construction of wind turbine generators. The company's subsidiary, Max Bögl Wind AG, has developed a mobile production facility for tower elements that enables wind turbines to be installed quickly and with consistent quality. It is set up at each installation site. This significantly reduces the number of delivery trips made by heavy trucks. With hub heights of up to 180 metres, the elements have to meet very high quality and safety requirements. Max Bögl relies on cement cooling to mix particularly stable con-

crete. Cryogenic liquid nitrogen is added when transferring the cement from the delivery trucks. The gas vaporises in the process and enters the silos along with the cement, continuing to cool the material. This ensures that the optimal temperature range is maintained during subsequent mixing of the concrete. The first production unit was put into operation in Huai Bong in Thailand, where the construction company is currently producing and assembling 90 wind turbine generator towers for the large-scale Korat Wind Farm project. The mobile factory can produce almost three towers a week. Messer in Thailand installed a 50-cubic-metre tank for this purpose in 2018 and is supplying the liquid gas.

China: Focus on greenhouse operators

Atmospheric CO₂ enrichment in greenhouses has been a widespread practice in Europe for some time now. The gas serves as a nutrient, thereby promoting plant growth. It is pleasing that Messer's greenhouse business in China also saw significant growth in 2018, not least thanks to good internal cooperation between Messer China and our central Application Technology Food department. Examples of this include joint reference customer visits in Benelux, a training event on the subject of greenhouses in Kunming and joint visits to potential customers in China. The good level of exchange and the excellent work carried out by our Chinese colleagues has made it possible to conclude lucrative contracts with greenhouse operators such as Kunming Van den Berg Roses and Yunan AIBIDA

Service Close to the Customer – Selected Examples

Belgium: Convenient all-round service

Messer provides customers in Belgium with an automated cylinder tracking system and monthly all-inclusive billing. This system offers great benefits, particularly for building contractors who use cylinder gases for welding and cutting at numerous construction sites. The cylinders are recorded in the system using bar codes, allowing their location to be identified at any time. This considerably reduces the number of unreturned cylinders, in turn lowering costs. The customer receives a total monthly bill that covers the recorded consumption of gases as well as all associated services such as transport or cylinder rental. Customers benefit greatly by knowing the exact purchase price in advance and not having to wait for the bill before being able to invoice their own customers. All documents, such as invoices and delivery notes, are sent to customers in digital format.

France: Gourmet gases for beer gourmets

As part of a marketing campaign for breweries, Messer France formed a partnership with the "Mondial de la Bière" festival, which took place in Paris at the end of June 2018. Messer supplied CO₂ for the operation of 120 dispensing systems at the exhibitors' stands. On the first morning of the fair, which was reserved for trade visitors, two of our experts gave a talk on the advantages of our Gourmet gases: these include inerting with food gases for oxidation prevention in order to get the desired beer quality.

Germany: EuroBLECH in Hannover

At the EuroBLECH trade fair in 2018, Messer provided information on potential cost savings, new 3D metal printing applications and a practice-orientated service programme. We also showcased a virtual welding shop, “Welders’ point”, for the first time. This app lets you move around freely in a virtual welding shop with the aid of a VR headset. The user can trigger different actions through eye contact and thus get information on various welding processes. Choosing the right shielding gas for welding, the ideal flow rate and the optimum parameter combinations is key to minimising reworking, welding time and, thus, costs. Overall costs of production can be effectively reduced by making the right choice of gas and type of gas supply based on needs, along with optimum delivery of the shielding gas. With demonstrations by its specialists, Messer showed the varied applications of its products and provided information on the possible savings offered by the use of its ternary mixtures in cylinders.

Spain: Seminar for medical gas customers

In April 2018, for the second year in a row, Messer Ibérica held a technical seminar for health service representatives. It was attended by engineers, managers and purchasing managers from public and private health centres in different parts of the country. Messer provided information on products and services and covered topics such as quality control of medical gases, product traceability and safe handling of cylinder gases. The participants also visited the air separation unit in El Morell and the filling plant in Vilaseca, both of which are licensed to produce and analyse medical gases.

Hungary: Experiencing gases and know-how interactively

In February 2018, Messer Hungarogáz took part in “Sirha Budapest 2018”, an international trade show for the hotel, restaurant, catering and food sectors. As a special highlight, our stand featured an interactive touchscreen game that allowed visitors to guess which of our “Gourmet” gases are used in the production or packaging of certain foods.



An interactive source of information: the Messer Hungarogáz touchscreen gas quiz attracted the interest of many visitors.

Social Commitment





Social Commitment

Messer celebrates 120th anniversary

In 2018 our corporate group – Messer and the Messer Eutectic Castolin Group – celebrated its 120th anniversary together with the group's 8,624 employees. The anniversary motto was "Fit at 120". Messer was founded back in 1898 by Adolf Messer, who in his day employed four manual workers and a clerical worker at his workshop in Frankfurt-Hoechst, where they manufactured acetylene generators. Each week throughout the year 2018, we published 52 chronological and illustrated posts on Facebook and Twitter relating a part of the #MesserStory to the public – from 1898 to the present day. However, we wanted the main beneficiaries of our anniversary

year activities to be the employees of the "Messer World" as well as our customers and partners and the inhabitants of the town of Bad Soden, where Messer Group has its headquarters:

Free pop concert for the people of Bad Soden

On 9 June 2018, we organised a free open-air concert featuring Belgian singer-songwriter Milow for the people of Bad Soden as well as customers, partners and all employees at our German sites together with their families. The event with the internationally successful music star was advertised via Messer posters in the town centre, via local newspapers, journals, newsletters and various online media. In the two weeks prior to the concert, interested local citizens



Stefan Messer and Marcel Messer



Free open-air concert featuring Milow

had the opportunity to pick up tickets and admission wristbands from a Messer stand in Bad Soden's historic station building. On the day of the concert, around 5,000 people came to the Neue Kurpark in Bad Soden to hear Milow's performance, which included songs in English such as "Ayo Technology" and "Against the tide". We arranged to have food trucks next to the concert area to provide catering for the audience. Following the concert, there was an after-show party for customers and partners in our own event centre, the Adolf-Messer-Forum. Some 350 guests accepted our invitation.

The process of organising the event involved us cooperating closely with Bad Soden town council and the voluntary fire brigade as well as other local institutions. We also got an experienced events agency involved in our project to help us with the

conceptual design, organisation and staging of the concert. All costs associated with the concert, such as agency services, advertising posters, admission wristbands, fees for the musician and the band, equipment, stage, medical service, GEMA fees, insurance, safety barriers, security teams, toilets, set-up and dismantling, waste disposal etc., were borne by Messer.

Social responsibility in Bad Soden

As a family company, Messer has a long and vigorous tradition of taking on social responsibility. We act sustainably in accordance with our collective responsibility for people, progress and the environment. On the basis of these convictions as well as our strong local ties, we demonstrate our commitment as a family company through active involvement in a wide range of activities at all Messer locations worldwide.

Why concerts? We had previously organised a free open-air concert in the Kurpark in Bad Soden in 2012, with German pop singer Cassandra Steen, which was very well received by an audience of 5,000. Tickets for popular concerts are generally very expensive. Prices have been going up since concerts became the main source of income for pop musicians. Going to a concert (together) or participating in other cultural events can therefore often be beyond the means of many families and their children. Such families end up feeling culturally excluded from our society. What is more, you just can't experience a real live concert in your own living room.

Anniversary activities for employees and former employees

Under the motto "Fit at 120. Every step counts!", we organised a worldwide pedometer competition in the period from 1 April to 30 May 2018. All employees who wanted to take part in it, received a pedometer each and formed one or more teams per location or country and nominated a team leader. The team leader entered the figures calculated for the average number of steps taken by his or her team in an online database every week. At the end of the competition, the three teams with the highest average number of steps won a table tennis table or, alternatively, a table football game. The competition saw many colleagues arrange to go for a run after work or at the weekends, not only to improve their score but to get fitter as well – which at the end of the day also fostered a sense of connection with the company.

Furthermore, we offered an intranet game for all employees that allowed them to demonstrate their knowledge of Messer as well as their general knowledge. All the players who answered all the questions correctly could look forward to winning sports armbands for heart rate and fitness monitoring.

In September, Messer held a joint staff party at all its company locations worldwide. The parties at each location were themed on one of the 12 decades in which we have enjoyed success. In order to create a sense of community, an electronic communication system was installed, which enabled videos and photos to be exchanged live worldwide.



There was lovely late summer weather for the pensioners' meeting in Bad Soden.

Also, in September 2018, around 300 former employees from Germany attended a reception at Messer in Bad Soden. In the Adolf-Messer-Forum, the retirees listened to a presentation by Stefan Messer on the company's current developments. Afterwards, there was plenty of time to mingle and catch up with each other.

Social Commitment

Many Messer companies are involved in social projects. They are guided in this by the needs of their country and their immediate environment. In 2018, the main focus of commitment was on training and science as well as children and health. In this Corporate Responsibility Report, we publish just a

small selection of social projects to provide a sense of the range of activities in which we are involved.

Commitment to training and science

Poland: Messer supports primary school

Messer has built a reputation in Poland of being a dependable investor and trustworthy employer that supports charitable projects in local communities. The main focus at the moment is on promoting the educational opportunities available to school children from small towns. To this end, the Johannes Paul II primary school in Kaczki Średnie near Turek received a modern laptop and an overhead projector plus projection screen. The new multimedia equipment is being used primarily in foreign language classes.

Bosnia-Herzegovina: Messer promotes dual training

Messer Tehnopljin is sponsoring a pupil at the technical college for mechanical engineering as part of a pilot project to promote dual training in Bosnia-Herzegovina: Mirza Halilović is being given the opportunity to gather practical work experience with us too. His dual training came to an end on completion of his third year in June 2018. The pilot project is the product of an initiative launched by the German Chambers of Commerce Abroad (AHK) and the German Society for International Cooperation (GIZ).

Hungary: Messer supports technical training and education

For the eleventh time, "Pneumobil" in Hungary featured spectacular races and developments. The event was organised by AVENTICS in support of technical university education. We supply the compressed air needed to operate the vehicles that are designed and built by the entrants themselves. We also support the "Műszakik" team with argon for welding the frames as well as nitrogen for testing the pneumatic drives.



Pneumatically driven vehicles in Hungary



Karin Hein at Messer Industrial Gases, suggested that we become involved in the assistance project „Lids against polio“

Commitment to health and children

Germany: Plastic lids against polio

Messer Industriegase is supporting the "Lids against polio" project organised by Nuremberg-based charity "Deckel drauf e.V.". Instead of returning plastic bottle lids with the bottle or throwing them away, they're being collected and recycled. The proceeds from 500 lids are sufficient for one dose of oral vaccination that protects a child against the usually fatal disease, polio. Over 300,000 oral vaccinations have been financed so far thanks to the "Lids against polio" campaign

Germany: Post-Christmas gift giving

In February 2018, Messer donated over 3,300 euros to the children's cancer charity "Hilfe für krebserkrankte Kinder Frankfurt e.V.". The donation came from the proceeds of the Christmas Market at Messer-Platz in Bad Soden that we organised for the third time in November 2017. A team of employees sold grilled sausages, cakes and drinks

in the historic railway station building for a good cause. Our stalls were stocked by local retailers, the Bad Soden town council and the Slovenian Cultural Society.

Hungary: Celebrating together, learning from each other

Apart from scientific and ecological projects, Messer Hungarogáz is also committed to social aspects: as part of our Employer Branding programme, we have been promoting social awareness among our employees for two years now. Fittingly, in September 2018, our Family Day was also attended by a group of people with mental handicaps. They were employees from the workshop run by Hungary's Lámpás '92 Foundation. They gave an impressive demonstration of traditional rope-making techniques as well as how to make classic kites from tissue paper.

Germany: Messer invited 60 children to discover the world of gases

In July 2018, Messer in Bad Soden offered 60 children, between the ages of 10 and 13,

the opportunity to discover gases and their positive properties as part of the Ferien-spiele, a programme of organised holiday activities.

The children explored the permanent company exhibition in small guided groups. The exhibition offers lots of scope for discovery and fascinating experiences. The centre-piece is a 60-year-old restored air separation unit. Messer has prepared the unit so that visitors can look directly inside it, allowing them to gain a better understanding of the process of separating air into its main components – nitrogen and oxygen. The fact that industrial gases are needed for environmental protection, for instance in the recycling of reusable materials, is illustrated very clearly by ground-up rubber and a doll's refrigerator. Xenon lamps, helium balloons and a welded bicycle frame make it clear that while the world of gases may be invisible, it is no less exciting. Before the day ended with pizza, the children of Bad Soden had the opportunity to demonstrate their newly acquired knowledge in a short quiz.



Bad Soden-based family company Messer offered 60 children aged 10 to 13 the opportunity to discover gases and their positive properties as part of the "Ferienspiele", a programme of organised holiday activities.

The Foundations

The Messer family founded the charitable Adolf Messer Foundation in 1978 in memory of Adolf Messer, who would have turned 100 on 6 April of that year. The independent foundation is a shareholder in the Messer Group GmbH's two parent companies, Messer Industrie GmbH and MIG Holding GmbH, and supports science, research and the teaching of young scientists.

In the social and health spheres, the Messer family set up the charitable Dr Hans Messer Social Foundation in memory of Dr Hans Messer.

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

Adolf Messer Foundation

The purpose of the Adolf Messer Foundation is to be a driving force for education and science. According to its charter, the Adolf Messer Foundation supports science and research, public and vocational education and the provision of help to students. Well over 10 million euros has been spent for foundation purposes to date.

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 Adolf Messer Foundation also pursues this idea by supporting and recognising scientists who have attracted attention through special or outstanding achievements, by awarding scholarships and prizes and by supporting scientific and educational establishments.

The Adolf Messer Foundation's activities encompass support and funding as well as operational aspects. Since it was founded in 1978, it has operated as a charitable foun-

dation 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 Foundation exclusively and directly pursues charitable ends within the meaning of the "tax-advantaged purposes" section of the German tax code.

The purpose of the foundation is to support science and research as well as public and vocational education and training including student support. The aim as laid down in the charter is served in particular by granting one-off or recurring grants (bursaries) for education and training of eligible individuals, providing scientific or educational establishments predominantly in the Federal Republic of Germany with funds for scientific purposes or education and training purposes, and offering prizes and awards for special achievements by scientists and students in order to promote research and encourage individual initiative.

Adolf Messer Foundation Awards

In order to provide targeted support to young scientists and their research, the Adolf Messer Foundation has been giving two awards annually since 1994: one for post-doctoral researchers at Technische Universität Darmstadt and one for post-doctoral researchers at Goethe Universität, Frankfurt am Main.

The Adolf Messer Foundation award at TU Darmstadt, where Senator Adolf Messer himself was a student of mechanical engineering in 1898, serves to promote excellence in the fields of science and engineering as well as economics, social sciences and the humanities. It is the richest award for young scientists at TU Darmstadt. The award is intended to fund material and personnel resources for research projects at TU Darmstadt.

In each case, award decisions are made by an interdisciplinary awards committee appointed by the foundation and the university board. There is always a representative of the Adolf Messer Foundation on the awards committee.

Adolf Messer Award at Goethe Universität Frankfurt

The Adolf Messer Foundation Award also serves to support outstanding young scientists at Goethe Universität Frankfurt, although here the field is basic scientific and medical research. On 26 November 2018, Alexander Vogel, professor of atmospheric environmental analytics at Goethe Universität, received the Adolf Messer Foundation Award, endowed with 50,000 euros on the occasion of its 25th anniversary, for his research project on particulate matter pollution. Particulate matter is a form of pollution whose sources are not all understood to this day. This is because the very complex mixture is formed in the atmosphere from a wide variety of gaseous precursor molecules. Alexander Vogel's aim is to identify these molecules and thereby help to improve air quality. While he was a postdoctoral fellow at the Paul-Scherrer-Institut in Switzerland, Alexander Vogel developed a method for creating a molecular fingerprint from atmospheric particulate matter samples. By analysing them, he can determine

the secondary formation mechanism. The molecular fingerprint of particulate matter samples from Los Angeles, for example, exhibits a high percentage of nitrogen-containing organic molecules. The award-winner suspects that a reduction in nitric oxide emissions would also lead to a reduction of particulate air pollution in urban areas. However, in order to elucidate the formation mechanisms of individual substances, further analyses of atmospheric samples and specific laboratory experiments in which the formation of particulate matter is simulated are necessary. By comparing field measurements with the experiment, Alexander Vogel can already assign a portion of the signals in the real samples to certain processes and precursor molecules. Of the remaining unknowns, at least the molecular formula can be determined, so that potential sources and formation mechanisms can be investigated in further laboratory tests. Alexander Vogel will now set up the experimental method he developed at the Paul-Scherrer-Institut at Goethe Universität. Among other things, he requires a machine for high performance liquid chromatography, which can now be acquired thanks to the support provided by the Adolf Messer Foundation. His research approach has been met with great interest among environmental science master degree students.

Adolf Messer Award at Technische Universität (TU) Darmstadt

Ulrike Kramm, assistant professor in the chemistry and materials & earth sciences departments at TU Darmstadt since March 2015, develops non-precious metal catalysts for energy applications. They are modelled on nature and resemble the red blood pigment haemoglobin. In 2018, she received the Adolf Messer Foundation Award worth 50,000 euros for her research work.

In her search for a replacement for precious metals that are used in energy-relevant applications such as low-temperature fuel cells or electrolyzers, Ulrike Kramm is guided by an example from nature: the blood pigment haemoglobin. At the centre of the molecule, there is an iron atom surrounded by four nitrogen atoms. Unlike with haemoglobin, where the iron-nitrogen unit forms a molecular centre integrated into an organic molecule, the molecular centres developed by Kramm are integrated into pure carbon in the form of graphene. The metal contained in Kramm's catalysts is not necessarily iron; it can also be cobalt, copper or manganese for example. The metal requirement for catalysis is reduced significantly by integrating the metals into the molecular centre. In all of Germany, there is unlikely to be anyone who knows more about these promising catalysts than the 39-year-old scientist who studied engineering physics at Fachhochschule Zwickau (university of applied sciences) with the main emphasis on environmental technology before going on to work on the optimisation of new fuel cell catalysts in a cooperative project between Helmholtz-Zentrum Berlin (HZB) and Toyota. In her doctoral thesis at HZB, which she completed in 2009, Kramm researched the structure of non-precious metal catalysts. During spells as a postdoctoral research fellow at Canada's INRS-EMT research institute in Varennes, at HZB and at Brandenburgische Technische Universität Cottbus-Senftenberg (university

of technology), she continued to pursue structure elucidation and also developed a cleaning procedure that boosts catalyst performance. Together with her team at TU Darmstadt, she is now working on improving the long-term stability of non-precious metal catalysts. In addition, her group is developing new analytical methods to further elucidate the structure of the catalysts as well as the catalytic mechanisms. She would now like to use the funds received with the Adolf Messer Foundation Award to research a completely new synthesis route and also examine the extent to which the concept of metal-nitrogen units can be applied to other molecular centres for catalysis in energy applications.

Learning German at TU Braunschweig

In 2018, the Adolf Messer Foundation supported the international summer courses in German language and culture at TU Braunschweig (university of technology). The language centre at TU Braunschweig has been running international summer courses for over 30 years. Students from all over the world can learn German, make lots of new contacts and experience and learn about German history, industry and culture on excursions to Berlin, Wolfsburg or the Harz Mountains. The language centre also awards scholarships; for example, bursaries are available for especially qualified students from Eastern Europe as well as South-East Asia, Central Asia, South Africa and South America. The Adolf Messer Foundation provided financial support in 2018 – as it did in previous years.

Dr Hans Messer Social Foundation

The aim of the Dr Hans Messer Social Foundation is to support the most vulnerable in our society. In accordance with the charter, the Dr Hans Messer Social Foundation supports charitable projects and projects in the sphere of social or welfare work. Assistance may also be provided on an individual case basis.

Even today, there are many people who are more vulnerable than others. Those who are sick or in need of care, who do not get enough support in our society but need help urgently.

This is exactly where the Dr Hans Messer Social Foundation wants to provide assistance. In keeping with the times, it puts into effect the social mandate 'to help others', which is its obligation in accordance with the will of the founder.

The Dr Hans Messer Social 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 in 2004. It is held in trust by the Adolf Messer Foundation.

In cases where people's own strength and means are not sufficient, and where adequate support cannot be provided by the state either, that is where the Dr Hans Messer Social Foundation provides assistance. A social mandate that was always very important to the founder, Ria Messer, as well as the person that the foundation is named after, Dr Hans Messer.

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 organisations or other tax-privileged bodies operating in the charitable sector or other tax-privileged organisations providing care and treatment to individuals suffering from serious illnesses through no fault of their own.

Rapid assistance for sick children

When an urgent announcement came in from the Stiftung Kinderzukunft (Children's Future Foundation) in 2018, the Dr Hans Messer Social Foundation didn't hesitate for long. It has supported the children's charity's projects on numerous occasions, being a firm believer in the professional work carried out by the foundation, which is based in the neighbouring town of Gründau. This time the news concerned sick children in the children's village in Guatemala who needed surgery in Quetzaltenango as quickly as possible. While this was rather sad news, the Dr Hans Messer Social Foundation was all the more hopeful of being able to alleviate the distress quickly with its spontaneous assistance.

Group Management Report of the Messer Group GmbH

General Information on the Group

Overview of the activities of the Messer Group

Messer Group GmbH ("the Company"), an industrial gases manufacturer, has its registered office in Sulzbach/Taunus near Frankfurt am Main and its postal address in Bad Soden am Taunus. It acts as a management holding company and, together with its subsidiaries and affiliated companies, forms the Messer Group ("the Group").

Messer was founded in 1898 and is today the world's largest family-run specialist for industrial, medical and specialty gases. Products and services are offered in Europe, Asia and America under the 'Messer – Gases for Life' brand. Messer Group GmbH has its own subsidiaries in Europe and Asia.

From acetylene to xenon, the Messer Group offers one of the most diverse product portfolios in the market, producing industrial gases such as oxygen, nitrogen, argon, carbon dioxide, hydrogen, helium, shielding gases for welding, specialty gases, medical gases and a wide variety of mixed gases.

In state-of-the-art competence centers, the Messer Group develops application technologies for the use of gases in almost all branches of industry, in food technology, medicine as well as research and science.

In June 2018, Messer began the process of pooling its application technology expertise. It now operates a new competence center located not far from its site in Krefeld, Germany, where tests are performed on gases-related technologies in the fields of food, industrial cryogenic applications, cutting and welding as well as chemistry and the environment. Messer prides itself on taking a forward-looking approach to the products it sells, tailored as far as possible to the needs of customers. Gumpoldskirchen, near Vienna, Austria, is the hub for developing high-temperature processes together with customers, cooperation partners and research institutes. New technologies, gas mixtures and applications for cutting and welding are being developed in Hungary and China.

On July 16, 2018, Messer and the financial company CVC Capital Partners reached an agreement with Linde AG and Praxair Inc. to acquire the majority of Linde's gases business in the USA, Canada, Brazil and Colombia and to take over Praxair's activities in Chile. The transaction itself was subject to the successful completion of the merger between Linde AG and Praxair Inc. and the approval of the relevant US antitrust

authorities. On 22 October 2018, the U.S. Federal Trade Commission (FTC) gave its clearance for the merger between Linde AG and Praxair Inc. in accordance with merger control law. The FTC approved the Messer Group as a “suitable buyer” on December 21, 2018.

Messer Industries GmbH, a joint venture between Messer Group GmbH and CVC Capital Partners, manages Messer’s business in Western Europe and America. Effective February 27, 2019, Messer Group GmbH contributed to the joint venture its Western European operations in Spain, Portugal, Switzerland, France, Belgium, the Netherlands, Algeria, Denmark and Germany as well as a free-of-charge right to use the „Messer“ brand for a period of ten years. The fair value of the contribution was measured at € 772 million.

For this reason, in the consolidated balance sheet of Messer Group GmbH as at December 31, 2018, the companies concerned are treated as discontinued operations within the meaning of IFRS 5 until the contribution becomes effective in law. The prior-year figures in the consolidated income statement and in the management report have been adjusted for the amounts relating to the Western European business units. The results of the Western European business units are shown separately as results from discontinued operations. Unless otherwise stated, the analysis of the results of operations, financial position and net assets is performed at the level of continuing operations. The general information provided on the Messer Group relates to the Group as a whole (including discontinued operations).

Changes in the group reporting entity in the fiscal year 2018

The group reporting entity changed as follows during the fiscal year under report:

First-time consolidations

The following entities were founded or acquired and commenced operations in 2018:

- Ningxiang Xianggang Messer Gas Products Co., Ltd., China, 55 %
- Kunming Anning Messer Gas Products Co. Ltd, China, 100 %
- Dongguang Moral Strength Messer Gas Co. Ltd, China, 60 %
- Messer Produktionsgesellschaft mbH Speyer, Deutschland, 100 %
- Messer GasPack II GmbH, Deutschland, 100 %
- Messer Family NewCo GmbH, Deutschland, 100 %
- Messer Industries GmbH, Deutschland, 49 %
- Yeti GermanCo 1 GmbH, Deutschland, 49 %
- Yeti GermanCo 2 GmbH, Deutschland, 49 %
- Yeti GermanCo 3 GmbH, Deutschland, 49 %
- Yeti NewCo 0 GmbH, Deutschland, 49 %

Acquisition of Buse Gaz S.R.L., Romania

Effective May 4, 2018, Messer Group GmbH – via its subsidiary Messer Romania Gaz S.R.L. – acquired 100 % of the shares in Buse Gaz S.R.L. The acquired company was subsequently renamed Messer Gaz Solutions S.R.L.

The acquisition strengthens Messer's position in the Romanian market for industrial gases and in the South-Eastern European region, especially in the highly competitive market for liquid CO₂ and dry ice. The filling plant acquired in Bucharest will be adapted to Messer's technical standards and expanded in order to optimize flexibility and the availability of supplies of technical gases. Shorter supply routes now mean that customers can be served faster and more flexibly. All 39 employees were taken over and integrated into the organizational structure of Messer Romania Gaz S.R.L.

Sale of Messer Gases del Perú S.A., Peru

Effective February 1, 2018, the Messer Group sold Messer Gases del Perú S.A., based in Lima. The company was acquired by Indura S.A., Chile, a subsidiary of Air Products. All sites and facilities as well as the 153 employees of the Peruvian company were taken over by Air Products.

Sale of shares without loss of control

In November 2018, Messer Griesheim (China) Investment Co. Ltd., Shanghai, reduced its 100 % holdings in Shaoxing Messer Gas Products Co., Ltd. ("Shaoxing") and Messer Sunshine (Ningbo) Gas Products Co., Ltd. ("Ningbo") in each case by 30 % to 70 %. These transactions were implemented in conjunction with an interim financing agreement with the original joint venture partner Hangzhou Tian-an Investment Holding Co. Ltd., following the exercise of that entity's repurchase right.

Financial performance indicators

The Messer Group uses parameters based on operating performance indicators to manage its business. The principal indicators are revenue, EBITDA, investments, net debt and ROCE. Further explanations and the make-up of the indicators are provided in the sections on earnings performance and financial position.

Non-financial performance indicators

Safety, health, environmental protection and quality ("SHEQ") have been firmly embedded in Messer's guiding principles since its foundation in 1898 and continue to have the utmost priority in the operations of the family-owned company. Messer is aware that well-organized safety and quality guidelines form the basis for dealing safely with operational risks and improving operational performance. For this reason, the health and safety of our workforce and the protection of the environment are firmly embedded in total quality management systems and reflected in various standards of the Messer Group.

To take account of the growing importance of ensuring a healthy environment, social justice and effective business management, the Messer Group has introduced a system of Corporate Social Responsibility Management ("CSR"). CSR follows a long-term approach and will contribute to the sustainable development of Messer. To this end, the Messer Group has also enhanced its SHEQ performance indicator system.

The following information on non-financial performance indicators relates to the Group as a whole (continuing and discontinued operations).

During the past fiscal year, 899 (2017: 990) SHEQ-related inspections and checks were carried out throughout the Messer Group (of which 796 in Europe), resulting in numerous improvement measures.

In addition, 241 ideas and suggestions for improvements were submitted by our staff members throughout the Messer Group (of which 58 in Europe).

Occupational safety

Occupational safety is of the utmost importance to the Messer Group. The Messer safety guidelines reflect our position: "All industrial illnesses, injuries and accidents are avoidable".

Messer uses its global management system to identify and control potential operational risks. The principles of this system are carefully documented in its SHEQ manual and cover all safety-relevant areas such as risk management, safety training, safety inspections, personal protective equipment, communication safety and accident investigations. The SHEQ Manual is a constituent part of the Messer Group's Compliance Management system and is regularly updated and improved.

Additional safety guidelines have been developed for work at acetylene plants and are regularly updated and improved. In 2018, further safety guidelines were put in place for work at gas filling plants as well as for work with oxygen used for cleaning. In addition, regular training courses are offered via an e-learning platform for employees in various working environments.

	2014	2015	2016	2017	2018
Working accidents causing lost days	18	22	25	15	14
Accident frequency	1.7	2.2	2.4	1.4	1.3
Accident severity	47.6	65.1	77.9	45.4	64.0

As a specialist in industrial gases, Messer is aware of its duty in relation to its staff and customers to efficiently identify and avoid potential work-related risks. With campaigns such as our "Safety Day", we highlight potential hazards and endeavor to raise safety-at-work consciousness.

Messer is an active member of the European Industrial Gases Association (EIGA) and of the Industrial Gases Association (AIGA) in China. Our experts actively exchange experience, knowledge and lessons to learn from incidents in the industrial gases sector. In addition, some Messer Group entities cooperate with local research institutes and universities to enhance safety in production processes.

Employees and corporate culture

Worldwide workforce

The Messer Group had an average worldwide workforce in 2018 of 5,728 employees (2017: 5,633 employees), each contributing to the success of the business with his or her extensive knowledge, ideas, know-how, motivation, attitude to work, active commitment and in many cases longstanding experience.

The average number of employees per region was as follows:

	Jan. 1 – Dec. 31, 2018	Jan. 1 – Dec. 31, 2017
Western Europe	1,108	1,108
Central Europe	774	752
South Eastern Europe	1,398	1,354
China, ASEAN	2,448	2,419
Total number of employees	5,728	5,633

At December 31, 2018, approximately 88 % of our employees were working in non-German speaking countries.

Training and the Messer Group Academy

The expertise and experience of our workforce of well-motivated and well-qualified employees provides the foundation for the Messer Group's success. They are constantly being required to rise to the practical challenge of highly demanding tasks and projects, at which stage they can also draw on the knowledge gained through attendance at internal and external training courses, specifically designed to meet their needs. This combined approach gives them the wherewithal to master the vast array of constantly changing work requirements, while at the same time enhancing the professional manner with which they go about their work. A transparent leadership style, based on an "open door" principle, allows for open communication and remains a core element of our management culture.

As a tried and tested basis for systematic staff development, the Academy Messer Group offers various training courses covering technical issues as well as the development of personal skills. The regular series of events organized each year for local managing directors and junior managers, during which current trends are addressed, always proves popular.

2018 also saw the continuation of the series of Junior Circle seminars, our program for the next generation of managers, with participants from various national companies and specialist areas. The focus of the Junior Circle is on the dissemination of knowledge by our own experts from various functions within the organization. Aspiring managers attend five one-week modules covering various fields of focus, including inter-cultural training. The principal objective of the Messer Academy is to provide an insight into our products, technical solutions, structures and specific internal issues based on a comprehensive and practice-oriented approach. Effective networking of the participants is also a primary concern. Training in the Junior Circle is organized over a two-year period, with candidates being selected and invited directly by the management under an internal application procedure. The Junior Circle is now into its third group of participants, who started the two-year program back in July 2017, and are now engaged in a range of projects focused on digitalization. These projects include preparing a so-called "chatbot", looking at

ways of optimizing the cylinder business using digital technology and preparing for the introduction of digitally controlled air separation plant maintenance.

At the Messer Group Academy, the transnational training course "Focus on Cylinder", devised for cylinder salesmen, was also continued in 2018. Training sessions took place in the Messer companies in Western Switzerland, the Baltic States, Hungary, Bosnia, Bulgaria and Macedonia. This international, standardized sales training course consists of six modules, is offered to a maximum of 14 participants and takes place in the respective national language. In addition to internal and external speakers, the respective sales manager and deputy are trained as co-trainers who are then able to provide support for future training courses. Throughout, country-specific needs are taken into account in terms of training content.

The training needs of Messer Group staff are discussed on the occasion of annual employee performance reviews with the local HR departments responsible for drawing up specific training plans.

In order to increase knowledge of English in the Group, we offer an "English language offensive" worldwide. In each company, employees have the opportunity to improve their language qualifications in one of three groups, depending on their language skills. Some employees have already taken the opportunity to acquire a Cambridge certificate, which is recognized worldwide.

In addition, the e-learning platform was further expanded in 2018.

Digitalization, IT security and data protection

Digitalization is becoming an increasingly important topic for the Messer Group, a development reflected in the current Junior Circle group's work on a range of digitalization-related projects. Similarly, the importance of IT security is also growing. Both the Group Digital Officer ("GDO") and the Group Security Officer ("GSO") specify the standards to be applied throughout the Messer Group. In addition to their involvement in IT projects, they also advise centralized functions and national companies in the relevant areas.

The transitional period for implementing the General Data Protection Regulation (GDPR) expired in May 2018, necessitating a great deal of additional and varied work to ensure compliance with data protection legislation. In November 2018, an internal Data Protection Officer was nominated for the first time for Messer Group GmbH and is committed to optimizing and bringing the relevant projects to a successful conclusion.

During the annual worldwide HR-Meeting in September 2018, the HR managers of the national companies also addressed the topics of data protection and cybercrime. The appointment of a Data Protection Officer has contributed significantly to a good understanding of these complex issues across the Messer Group.

Uniform employee branding

The Messer Group's Employer Branding project is an international program aimed at depicting a corporate culture that is easy to recognize and understand. On the one hand, it is seen as a way of tying in new and current employees more closely to the business, but also as a means of getting potential employees to be enthusiastic about us, our products and our solutions, with the aim of achieving the anticipated result of receiving fewer, but qualified applicants. As a flanking measure, image promotion films and posters have been completed and the Group's website further optimized, including a redesigned career page. The applicant portal for the Messer Group, which has been programmed by our IT company Messer Information Systems GmbH, is being continually optimized. In this way, the Messer Group, via uniform employer branding, is able to showcase itself as an international, versatile, attractive employer.

Environmental management

The environment must be protected at all times and in all places. As a company, Messer takes this obligation seriously and employs its global management system to further the protection of the environment. Internal environmental protection guidelines are documented in the Messer Group's SHEQ manual. These and the environmental management systems in place at all the subsidiaries follow international standard ISO 14001 and recommendations of the European Industrial Gases Association (for example, EIGA IGC Doc. 107 — Guidelines on Environmental Management Systems). In 2018, 23 of our subsidiaries obtained external certification of their environmental management systems, compared with 21 companies in 2017.

Efficient use of energy goes without saying at Messer and is clearly in the Group's own interests. With the main aims of cost-cutting and economic use of resources, energy management is an ongoing process which also makes a contribution to reducing our CO₂ emissions. Our energy management system, for instance, has been certified in accordance with ISO 50001 at all Messer production facilities in Germany and Spain.

Messer uses atmospheric air and electrical power at its production sites as the main raw materials to produce the gases nitrogen, oxygen and argon. Production by means of air separation plants accounts for over 75 % of total energy consumption. Particular emphasis is therefore placed on the ongoing improvement of energy efficiency. Accordingly, Messer has assigned the specific task to a Global Energy Officer ("GEO") to increase the energy efficiency of the Group's air separation plants.

Continuous monitoring of plant efficiency brings to light any energy variations and enables potential for improvement to be identified. Working together with local managers, projects are continuously initiated in order to improve energy efficiency.

The key environmental data of Messer's production activities during the past year are as follows:

The volumes of gases produced rose by 8 % compared to the previous year, as a result of which the electricity consumption of the Group's air separation plants also rose. On the other hand, energy efficiency, measured in terms of energy consumption per cubic meter of gas sold, improved by 1.2 % compared to the previous year.

New on-site plants were commissioned again in 2018 with a view to bringing about reductions in transport costs to deliver liquefied gases as well as in CO₂ emissions. These plants are used for on-site gas production, saving approximately 3,100 truck journeys and 550 tons of CO₂. As a result, local customers benefit simultaneously from flexibility and security of supply.

Numerous other smaller-scale activities also contributed to improving energy efficiency.

At one southern European plant, the cooling water system was retrofitted with frequency-regulated pumps, saving 270 MWh per year.

At one filling plant, improved building insulation and replacement of the boiler reduced natural gas consumption during the heating season by around 4,000 m³.

A product compressor was renewed to supply a major pipeline customer. The new compressor is more efficient, and its capacity can be adapted more effectively to the customer's requirements. At peak times, electrical power consumption can be reduced by up to 1 MW, saving, on average, about 1,500 MWh p.a.

Health management

Messer is aware of its social responsibility vis-a-vis its employees. With this in mind, it strives to encourage the good health and well-being of each individual through its working standards. For instance, Messer has introduced various health programs, such as free access to fitness and wellness centers for employees and their families. Measures of this kind are designed to promote a healthy lifestyle among employees.

Furthermore, a comprehensive training program for handling gas cylinders was initiated, with a view not only to reducing accidents associated with this, but also to improving the prevention of industrial diseases such as musculoskeletal disorders.

Financial Report

General economic conditions and sector environment

The various products made from industrial gases and related services and technologies are used in almost all branches of industry, but also in the foodstuffs technology, medicine and research and science sectors. For this reason, gross domestic product (GDP) is a highly relevant indicator for the Messer Group's performance.

Actual global economic development in 2018 was largely in line with expectations. According to estimates made by the International Monetary Fund („IMF“)¹ and the World Bank², the global economy grew roughly at the same pace as one year earlier. According to the World Bank, global real GDP is estimated to have risen again by 3.0 % in 2018, despite a slowdown in growth momentum during the second half of the year in some areas. In geographical terms, however, actual growth figures differed significantly from forecasts originally made for the global economy. GDP growth in the USA in 2018 was once again significantly stronger than expected, whereas GDP growth in the euro area slowed on a slightly more pronounced scale than predicted. The pace of growth in emerging and developing economies, as well as in developed industrial countries, was similar to the previous year. The two different rates of GDP growth estimated by the IMF for emerging and developing countries at 4.6 % (2017: 4.7 %) and for developed industrialized countries at 2.3 % (2017: 2.4 %) continued to apply.¹

Economic growth in Europe in 2018 fell short of the rate recorded one year earlier. According to the figures of the Organization for Economic Cooperation and Development (OECD)³, GDP in the euro area grew by an estimated 1.9 % in 2018. If this figure turns out to be correct, the growth rate in the region would have slowed down by a further 0.6 percentage points compared to the previous year. Reflecting this trend, GDP growth in all major economic regions, such as Germany, France, Italy and Spain, slowed on a similar scale. GDP growth for European countries outside the euro area exceeded that recorded for the euro area. This was evident, for example, in growth rates posted by Poland (+5.2 %) and Slovakia (4.1 %) as well as by South Eastern European countries such as Hungary (+4.6 %) and Slovenia (+4.4 %). Apart from these trends, the pace of economic growth accelerated in some countries, such as in Poland and Switzerland.

In China, GDP growth slowed in 2018 in line with expectations and, according to World Bank estimates, will slip from an unexpectedly strong 6.9 % in 2017 to 6.5 % in 2018. The Chinese Government is continuing in its endeavors to reduce the Chinese economy's dependence on exports by boosting domestic demand with a corresponding focus on consumption and services. So far, however, this has not caused China to lose its top spot in the world's GDP growth table.

¹ World Economic Outlook, Update January 21, 2019

² Global Economic Prospects, January 2019

³ OECD Economic Outlook – Volume 2018 Issue 2

Course of business

For the Messer Group, the fiscal year 2018 was shaped above all by an unexpectedly strong performance in China, boosted by very strong demand and exceptionally high market prices, particularly in the liquefied gases market segment. Steel production in China also increased. Economic recovery continued throughout Europe, with economic activity up in many countries. These favorable economic conditions helped the Messer Group in 2018, contrary to our forecast at this stage last year, to achieve significant year-on-year revenue growth. In the final analysis, revenue (including revenue from discontinued operations) grew by 9.6 %. Similar to the revenue performance, the Messer Group's EBITDA turned out considerably better than our original expectations for the year. Instead of the sharp decline in EBITDA forecasted for 2018, actual EBITDA (including EBITDA recorded for discontinued operations) increased by more than 15.5 % year-on-year. Dynamic developments in China, which far exceeded expectations, made the decisive contribution to this outcome.

Including the impact of the USPP currency hedge and contrary to the prediction made in the previous year's management report, the Messer Group again managed to reduce net debt during the reporting period from K€ 290,139 to K€ 264,291 at December 31, 2018.

Overall situation of the Messer Group

Results of operations

Adjusted for revenue from discontinued operations, the Messer Group generated worldwide revenue of K€ 1,010,444 in 2018 (2017: K€ 902,189) which can be analyzed by region as follows:

Revenue	Jan. 1 – Dec. 31, 2018	Jan. 1 – Dec. 31, 2017	Change in 2018
China, Vietnam, ASEAN	541,273	472,273	
South Eastern Europe	218,869	202,973	
Central Europe	209,632	195,857	
Western Europe	40,670	31,086	
Continuing operations	1,010,444	902,189	12.0 %
Discontinued operations	339,147	329,658	
	1,349,591	1,231,847	9.6 %

The Messer Group's revenue from continuing operations in the financial year 2018 was 12.0 % up on the previous year. Business developed in the various regions as follows:

China, Vietnam, ASEAN

In local currency terms, revenue in China rose by 25.3 % year-on-year, reflecting unexpectedly strong demand for all products in our industry. Our companies benefited mainly from ongoing growth in steel production volumes and in particular from extremely buoyant demand for liquefied gases, accompanied by rising market prices.

Revenue in Vietnam in local currency terms rose by 15.3 % year-on-year, driven by increased demand from our on-site customer, Hoa Phat, and the continued good utilization of production capacities for liquefied gases in the north of the country.

Our companies in the ASEAN region (excluding Vietnam) made a € 5.3 million (2017: € 2.4 million) contribution to overall revenue.

In the previous year, our company Messer Gases del Perú S.A., based in Lima, Peru, was also reported as part of this region, with revenue of EUR 15.9 million recorded in 2017. Effective February 1, 2018, the Messer Group disposed of the company.

South Eastern Europe

Messer Group revenue in South Eastern Europe increased by 7.8 %, with almost all companies recording significant revenue growth. The commissioning of the first air separation plant in Slovenia in April 2018 as well as the acquisition of Buse Gaz S.R.L. in Romania had a particularly positive impact. In addition, the Group's operations in Bosnia, Serbia and Hungary recorded significant growth, with revenue up on average by 9 % in local currency.

Central Europe

The Central Europe region recorded a 7.0 % increase in revenue. All countries in the region performed well, with Austria, Poland, Slovakia and the Czech Republic, recording revenue growth of between 5 % and 10 %.

Western Europe

Figures for Western Europe have been adjusted for discontinued operations, so that this region now only includes the industrial gases operations of ASCO Kohlensäure AG as well as the operations of the service companies Messer GasPack GmbH, Messer Information Services GmbH, Messer Finance B.V. and Messer Group GmbH. Revenue of these companies rose by 31 % year-on-year, boosted in particular by growth recorded by the centralized engineering department at Messer Group GmbH.

The Group recorded an EBITDA of K€ 302,699 for the fiscal year 2018 (2017: K€ 225,320).

EBITDA	Jan. 1 – Dec. 31, 2018		Jan. 1 – Dec. 31, 2017	
	Continuing operations	Discontinued operations	Continuing operations	Discontinued operations
EBIT	191,898	30,294	125,177	13,903
Depreciation, amortization and impairment losses on intangible assets and property, plant and equipment	110,801	32,112	100,143	50,561
Dividend income ¹	–	51	–	43
EBITDA	302,699	62,457	225,320	64,507
: Revenue	1,010,444	339,147	902,189	329,658
Margin:	30.0 %	18.4 %	25.0 %	19.6 %

¹ Dividend income from non-consolidated companies

Operating profit from continuing operations was influenced above all by a sharp rise in revenue (+12 %), while selling expenses remained virtually unchanged. In addition, the deconsolidation of Messer Gases del Perú S.A., Peru, in the year under report gave rise to a gain of K€ 8,477. Impairment losses of K€ 3,854 recognized on property, plant and equipment and intangible assets had an offsetting effect. In addition, an impairment loss of K€ 4,400 (2017: K€ 4,725) was recognized on goodwill. Operating profit in 2017 included a positive effect of K€ 5,113 arising on the reversal of impairment losses on property, plant and equipment and a negative effect of K€ 2,745 as a result of impairment losses recognized on intangible assets.

The improvement in the operating result from discontinued operations was mainly attributable to the impairment loss of K€ 10,614 recognized in the previous year on goodwill. No impairment losses were recorded on non-current assets in 2018. Furthermore, in accordance with IFRS 5, with effect from October 22, 2018, no systematic depreciation or amortization was recognized on individual items included in non-current assets relating to discontinued operations. Instead, these items were measured at the lower of their carrying amount and their fair value less costs to sell. The suspension of systematic depreciation and amortization helped improve the operating result from discontinued operations by K€ 7,274.

The financial result includes a net negative interest result of K€ 20,237, representing a deterioration of K€ 2,968 compared to the previous year.

As a consequence of the contribution of the Western European operating companies to Messer Industries GmbH, the USD-denominated US private placements (USPPs) which had been issued to finance the Messer Group were terminated before their due date. The resulting early repayment penalty of K€ 5,580 is reported as part of the net interest result.

Gross financial debt increased by 16 % over the twelve-month period under report, mainly due to new borrowings raised in 2018 to finance long-term investment projects in Vietnam. Due to the more favorable interest rates on new borrowings and the scheduled repayment of financial debt existing at the beginning of the financial year, it was possible – excluding the impact described above – to reduce interest expense year-on-year.

The termination of the USD-denominated USPPs also necessitated the termination of the USD-denominated cross currency interest rate swaps. For this reason, there was no effective hedging relationship in place for these derivative financial instruments at December 31, 2018. Accordingly, the corresponding changes in fair value were recognized for the first time in the fiscal year 2018 in the income statement. The related expense of K€ 8,814 is included in other financial result. We refer to our comments in the section “Financial position”.

Other investment result (net) deteriorated by K€ 1,783 year-on-year, mainly due to the lower valuation of our investments in Estonia and Ukraine accounted for using the equity method.

Overall, the Group posted a net profit for the year (including minority interests) of K€ 138,039 (2017: K€ 83,663). Of this amount, K€ 101,460 (2017: K€ 59,864) is attributable to the shareholders of the parent company.

Financial position

Group Treasury is responsible for overall liquidity, interest rate and currency management. The most important objective of Group Treasury is to ensure that a minimum level of liquidity is always available to ensure solvency at all times. High levels of liquid funds help to improve our flexibility, security and independence. If necessary, we can call on additional liquidity potential under further various available credit lines amounting to € 59.5 million.

Financing

The Messer Group is financed via a Term and Revolving Facilities Agreement (RFA I) with a volume of € 160 million, provided by prestigious banks in Germany. Interest is based on IBOR (Inter Bank Offered Rate) in the currency in which amounts are drawn down plus a margin, depending on the ratio of net debt / EBITDA. In addition, two US Private Placements (USPP II, USPP III) remain in place.

Guarantees provided by individual Group entities serve as collateral for the financing arrangements.

The contribution of the operating Western European companies to Messer Industries GmbH in February 2019 (see section 1 „Overview of the activities of the Messer Group“) triggered contractually agreed reasons for the USPP II and USPP III noteholders and for the RFA I banks to terminate the relevant agreements. Notification of termination was received for USPP III (USD 100 million) and USPP II (USD 57 million) (both denominated in USD) and for the repayment of these USD notes in the event of the contribution. However, all USPPs denominated in euro remain in place.

A new Term and Revolving Facilities Agreement (RFA II) was agreed with the banks that had previously been party to RFA I agreement, thereby underpinning a sound financing basis for the Group. RFA II comprises tranche A for € 40 million (Term Loan), tranche B for € 100 million (Revolving Credit) and a USPP backstop facility (BSF) for € 380 million, and runs until December 18, 2023.

The BSF served to secure the possible repayment of the part of the financial debt financed by US Private Placements. RFA II becomes available once specified conditions precedent have been fulfilled. These conditions were fulfilled on February 26, 2019. The BSF was not needed in conjunction with the repayment of the USPPs and is therefore no longer applicable.

In anticipation of the necessary repayment of the USD Notes (totaling USD 157 million), Messer Group GmbH refinanced € 87.8 million at 1.49 % on January 29, 2019 by means of a further US Private Placement (USPP IV) and USD 100 million of USD Notes issued by Metlife. Funds managed by Prudential Management Inc. have provided the money. Messer Group GmbH is the debtor under the five-year USPP IV, which falls due for repayment at the end of the term.

The USD Notes issued by Voya (USD 57 million) were repaid when the operating Western European companies were contributed to Messer Industries GmbH, and the outstanding amounts under RFA I were rolled into RFA II.

Net debt as at December 31, 2018 stood at K€ 264,291 (2017: K€ 290,139) and is broken down as follows:

Net debt	Dec. 31, 2018	Dec. 31, 2017	Change in 2018
Financial debt	541,767	481,463	
Currency hedge USPP	–	(15,310)	
Gross financial debt	541,767	466,153	
Cash and cash equivalents	(277,476)	(176,014)	
	264,291	290,139	-8.91 %

Net debt of the Messer Group decreased in 2018 by K€ 25,848 compared to the end of previous fiscal year. The ratio of gross financial debt (K€ 541,767) to total assets (K€ 2,405,397) was 22.2 % at the end of the reporting period (2017: 22.5 %).

The change in gross financial debt excluding USPP currency hedging is shown below:

Gross financial debt at January 1, 2018	481,463
Cash-relevant changes:	
New debt raised	77,420
Repayments	(33,542)
Non-cash-relevant changes:	
Changes due to currency translation	9,786
Other non-cash-relevant changes	6,640
Gross financial debt at December 31, 2018	541,767

Due to the contractual arrangements for the contribution of the Western European companies, the financial liabilities of these companies totaling K€ 60,676 are reported as part of continuing operations.

Cash flow statement

Cash flows from continuing and discontinued operations were as follows:

Abridged version in K€	Jan. 1. – Dec. 31, 2018	Jan. 1. – Dec. 31, 2017
Profit before taxes	187,582	113,145
Cash flows from operating activities	322,298	281,234
Cash flows from investing activities	(215,376)	(137,460)
Cash flows from financing activities	8,925	(78,235)
Changes in cash and cash equivalents	115,847	65,539
Cash and cash equivalents at the beginning of the period	176,014	113,984
Exchange rate impact on cash and cash equivalents	(590)	(2,465)
Cash, change in group reporting entity	–	–
Cash classified as held for sale	(13,795)	(1,044)
at the end of the period	277,476	176,014

At K€ 322,298 the total of cash flows from operating activities was K€ 41,064 higher than in the previous year. This increase was influenced in particular by the higher net income reported for the year.

The change in cash flows from investing activities again reflected the continued high level of investments made by the Messer Group. The major part of the outflows related to investments in property, plant and equipment. The sale of our company in Peru generated proceeds, which were offset by outflows for the acquisition of Buse Gaz S.R.L., Romania.

Cash inflows from financing activities corresponded to positive amount of K€ 8,925, an improvement of K€ 87,160 compared to one year earlier, reflecting new debt raised compared to scheduled repayments in 2018.

Liquid funds held by the Messer Group at December 31, 2018 totaled K€ 277,476.

In 2019, the Messer Group will again require further capital to fund its expanding business operations and scheduled capital expenditure and to repay loans and interest as they fall due, notwithstanding the fact that the medium-term strategy is to consolidate net debt levels relating to operations outside China. The necessary funds will be generated out of cash flows from operating activities, existing funds and credit lines available to the Group. The Messer Group's strong position in the various markets in which it already operates, combined with expansion into new markets, will enable us to maintain our robust financial position.

The Messer Group has committed to purchase, or invest in the construction and maintenance of, various production facilities. Obligations under these agreements represent commitments to purchase plant and equipment at market prices in the future. The Group is also party to long-term contracts which give rise to obligations. As of December 31, 2018, purchase and capital expenditure commitments and long-term contracts totaled K€ 82,528 (2017: K€ 91,282).

Capital expenditure

Capital expenditure continues to be focused on safeguarding existing business and opening up opportunities for growth. In accordance with normal business principles, the Messer Group invests primarily in projects that will secure supply capabilities and/or which create opportunities for profitable growth. Furthermore, regular investments are made in the modernization of production plants and distribution channels.

The following section describes capital expenditure undertaken for the Messer Group as a whole i.e. including both continuing and discontinued operations.

The Messer Group's capital expenditure on property, plant and equipment and financial investments totaled € 240 million. The capital expenditure ratio corresponds to 17.8 % (2017: 11.7 %) of revenue.

Investments in intangible assets and property, plant and equipment totaling € 232 million mainly related to the construction of air separation plants in Vietnam and production plants in Hungary and China. Investments in financial assets of € 7.6 million mainly relate to the acquisition of Buse Gaz S.R.L., Romania. Reference is made to the disclosures provided in the section 1 "Changes in the group reporting entity in the fiscal year 2018".

Capital expenditure by region was as follows:

Capital expenditure in K€	Jan. 1. - Dec. 31, 2018	Jan. 1. - Dec. 31, 2017
China, Vietnam, ASEAN	125,287	47,017
South Eastern Europe	49,888	38,459
Western Europe	18,668	18,422
Central Europe	18,131	18,291
Continuing operations	211,974	122,189
Discontinued operations	27,608	22,043
	239,582	144,232

In China, the main focus is on investing projects that will further strengthen our position in the liquified gases market and help promote a good balance in terms of customer diversification based on the existing business model. Systematic endeavors to increase customer diversification also include investments in a gases supply plant for high-purity industrial gases for an on-site customer from the electronics industry in Sichuan province, the general expansion of CO₂ capacities and the start of construction of a specialty gases plant in Anhui province for the electronics industry.

In Vietnam, construction work on the fourth air separation plant for on-site customer Hoa Phat at its production site to the east of Hanoi and on two further air separation plants for its new steelworks in the center of the country in Dung Quat progressed sufficiently to enable commissioning of the plants by mid-2019.

Capital expenditure in Europe remains focused on investment in distribution channels and selected growth projects. The latter includes the completion of the project to expand existing CO₂ production capacities in Hungary as well as the construction of the first air separation plant in Slovenia, which will ensure the independence of supplies for our industrial gases operations in this country going forward. In addition, we also acquired Buse Gaz S.R.L. in Romania. In Germany, as a part of discontinued operations, construction began on the third air separation plant (in Speyer) and the first hydrogen plant.

Net assets

The balance sheet total went up by K€ 199,371 during the fiscal year under report and stood at K€ 2,405,397 thousand as at December 31, 2018, with a K€ 101,462 increase in cash and cash equivalents making a major contribution to this development.

At 59.1 % (2017: 76.8 %), non-current assets accounted for the largest proportion of the balance sheet total. At December 31, 2018, assets relating to discontinued operations were classified as "assets held for sale". Including these assets, total non-current assets at December 31, 2018 accounted for 73.73 % of the balance sheet total.

Tangible and intangible assets represented the largest combined item on the assets side of the balance sheet, accounting, as one year earlier, for 51.2 %. The carrying amount of these two items together decreased by K€ 252,970. The reclassification of assets relating to discontinued operations caused tangible and intangible assets to decrease by K€ 341,091. New capital expenditure in the fiscal year 2018 had an offsetting effect.

Currency effects (including minority interests) had the effect of decreasing the balance sheet total by K€ 7,827 and were related mainly to our Chinese and Hungarian companies. The equity ratio (including minority interests) increased to 61.2 % (2017: 61.0 %).

Gross financial debt went up by K€ 60,304 and accounts for 22.5 % of the balance sheet total. USD-denominated USPPs amounting to K€ 160,593 were reclassified to current financial debt as a result of their upcoming early repayment. This reclassification was the main reason for the K€ 152,259 increase in current financial debt. At the same time, non-current financial debt decreased by K€ 91,955. In this case, the aforementioned reclassification compared with K€ 70,909 of new financial debt. We refer to our comments in the section on the Group's financial position.

Return on employed capital

The return on capital employed (ROCE) in the past fiscal year for continuing operations was 16.63 % and is calculated as follows:

ROCE	Jan. 1. – Dec. 31, 2018		Jan. 1. – Dec. 31, 2017	
	Continued operations	Discontinued operations	Continued operations	Discontinued operations
EBIT	191,898	30,294	125,177	13,903
+ Amortization of goodwill	4,634	–	4,725	10,614
EBIT adjusted	196,532	30,294	129,902	24,517
: capital employed	1,182,120	353,678	1,146,080	295,220
ROCE in %	16.63 %	8.57 %	11.33 %	8.30 %
Derivation of capital employed from the balance sheet:				
Other intangible assets and property, plant and equipment	961,625	319,544	920,320	265,101
Finance lease receivables	136,994	277	151,096	351
Net working capital	83,501	33,857	74,664	29,768
Capital Employed	1,182,120	353,678	1,146,080	295,220

In 2018, assets relating to discontinued operations were classified as non-current assets held for sale. The analysis of the change of the capital employed ratio is presented separately for discontinued operations and continuing operations.

Operating assets

In 2018, assets relating to discontinued operations were classified as non-current assets held for sale. The analysis of the change of the operating assets is presented separately for discontinued operations and continuing operations.

Net working capital comprises the following:

Net working capital	Jan. 1 – Dec. 31, 2018		Jan. 1 – Dec. 31, 2017	
	Continuing operations	Discontinued operations	Continuing operations	Discontinued operations
Inventories	43,687	11,713	47,596	11,343
Trade receivables	137,982	68,170	126,000	65,809
Trade payables	(90,445)	(45,416)	(82,866)	(47,299)
Advance payments received	(7,723)	(610)	(16,066)	(85)
	83,501	33,857	74,664	29,768

The 11.8 % increase in net working capital for continuing operations was mainly attributable to the increase in trade receivables (K€ 11,982), mainly at the level of our companies in China and Germany.

The ratio of inventories (less advance payments from customers) plus trade receivables less trade payables was, as year earlier, approximately 2:1. The ratio of net working capital to revenue for continuing operations remained unchanged at 8.3 %.

DSO (Days Sales Outstanding) for continuing operations decreased by one day from 50 to 49 days. The decrease in DSO related in particular to China and was attributable to improvements in the management of receivables and the conduct of our customers with regard to payments.

Taking into account discontinued operations, the ratio of net working capital to revenue would be 8.7 % (2017: 8.5 %). The DSO for the Group as a whole would be 55 days (2017: 56 days).

Overall statement on the Group's overall situation

Benefiting from an almost ideal economic climate, revenue of the Messer Group from continuing operations rose by 12.0 % year-on-year. Our business activities in Asia – and first and foremost in China – made a strong contribution to this result.

The EBITDA margin from continuing operations improved to 30 % (2017: 25.0 %), while EBITDA rose sharply from € 225 million to € 303 million.

The Messer Group's return on capital employed (ROCE) from continuing and discontinued operations improved sharply to 14.77 % (2017: 10.71 %). Instead of the sharp decline in ROCE forecasted for 2017, ROCE actually increased significantly, mainly reflecting the positive impact of the exceptional strong performance of our companies in China.

Good progress was also made with the consolidation of net debt during the fiscal year under report. In 2018, for instance, net debt was reduced year-on-year by a further € 26 million to € 264 million. Despite the termination of the USD-denominated USPP II and USPP III instruments, secure financing of our operations continues to be ensured by the new financing agreements. We refer to our comments in the section "Financing".

These overall very favorable developments represent good progress and testify to the stability and sustainability of the Group's business model. The Messer Group, operating in the two principal regions of Europe and China, has a global presence and good regional diversification in a number of countries or provinces within the two principal regions, so that falling demand in individual markets or downturns in specific sectors can often be offset.

Outlook

Macroeconomic and sector-specific risks

Developments such as a more restrictive monetary policy in the USA, the withdrawal of financing from emerging and developing countries, the global trade conflicts between the USA and both China and the EU, and the prospect of a disorderly „Brexit“ increased uncertainty around the world, particularly during the second half of 2018. Against this background, leading economic institutes are increasingly coming to believe that growth momentum has reached its peak and will slow down in 2019. For example, the IMF¹ and the OECD² expect global GDP to grow by 3.5 % in 2019, reflecting the first signs of weakening compared to the estimated GDP growth rate of 3.7 % for 2018. The slowdown in growth momentum is expected to be particularly noticeable in developed industrial countries, whereas growth rates in emerging and developing economies should not be far off their previous year's levels. For 2019, the IMF forecasts a GDP growth rate of 2.0 % for developed industrial countries as a whole (2018: 2.3 %) and one of 4.5 % for emerging and developing economies (2018: 4.6 %). In China, the ongoing process of change embarked upon with a view to strengthening domestic demand on the basis of consumption and services is expected to continue the trend of a decelerating growth rate. The IMF and World Bank forecast a GDP growth rate of 6.2 % for 2019, compared to the 6.5 % to 6.6 % estimated for 2018.

The World Bank and the IMF again point out the existence of forecasting risks in their predictions for 2019, the most significant of which are seen as a sudden change on the extremely favorable current level of financing conditions on the one hand and escalating global trade conflicts on the other.

Outlook for the Messer Group

The figures reported by the Messer Group for the year ended December 31, 2018 include new best results for EBITDA as well as for the ratio of net financial debt to EBITDA. The Messer Group's medium-term forecast continues to show growing profitability, coupled with a moderate increase in net financial debt. By investing on a sound basis, we also intend to raise revenue at a pace appropriate for the prevailing economic conditions and to take advantage of selected opportunities in order to stabilize or improve the profitability of the Messer Group.

We expect a moderate slowdown in Europe's economic growth rate. The pace of the slowdown could, however, be negatively impacted by a number of factors including selling price and competitive pressures (which could differ from country to country), a resurgence of the steel or financial crisis, a disorderly „Brexit“ or trade conflicts. In Europe, we will continue to focus on improving the profitability of our operations by optimizing the utilization of production capacities created in recent years and by engaging selectively in specific customer projects and increasing production capacities (e.g. in Slovenia or Hungary). Future investment decisions will be taken in line with the stated strategy of maintaining a good balance with net financial debt.

¹ World Economic Outlook, Update January 21, 2019

² OECD Economic Outlook – Volume 2018 Issue 2

The China region accounted for approximately half of revenue and approximately 60 % of the EBITDA of the Messer Group in 2018, based on key performance indicators for continuing operations. The net cash / EBITDA ratio for the China region was negative, reflecting the fact that cash funds exceeded financial debt. These figures underline the continuing importance of Chinese operations for total revenue, profitability and internal financing of the Messer Group.

Looking to the future, we expect China's growth rate to remain above the global average. Thanks to the excellent progress we have already made in diversifying our business, we remain convinced of our ability to participate in China's market growth across our entire product range. On the revenue side, however, we expect the exceptionally high selling price levels seen in the liquefied gases business during the past year to normalize in 2019. Furthermore, we think it likely that the continued focus on consumption and services in China will reduce the dominance of the production economy, particularly in the steel industry, which is so important for our business.

In the area of energy costs, which are important for our industry, we expect further price increases, especially in Europe.

The main key financial performance indicators for the Messer Group's continuing operations are forecast to develop as follows in the coming year:

	2019 compared to 2018
Sales	Moderately decreasing
EBITDA	Sharply decreasing
Capital expenditure	Significantly rising
Net debt	Sharply rising
ROCE	Sharply decreasing

Overall conclusion

The Messer Group's outlook has been drawn up based on the assumption that Europe's economic growth rate will slow down during the fiscal year 2019. China's growth rate is likely to continue to decelerate. Although global economic conditions still appear to be generally favorable, the growing number of risks present a serious challenge in terms of accurate forecasting of future economic developments. The main sources of risk and uncertainty that could have an impact on global conditions relevant for the Messer Group are a potential escalation of simmering trade conflicts, possible distortions following any radical change in monetary policy, the unknown effects of Brexit as well as the uncertain outcome of the ongoing transformation of the Chinese economy. These potentially adverse factors could also be accompanied by unforeseeable negative news from current trouble spots, particularly the North African and Arab region.

The Messer Group considers that it is well placed to meet the forthcoming challenges, while at the same time deeming it wise to adopt a prudent stance with regard to short-term expectations. The budgeted decrease in revenue and EBITDA for 2019 is mainly attributable to the assumption that the industrial gases market in China will normalize again compared to 2018 and that the euro will continue to gain in strength. The corresponding change in ROCE reflects the expected decrease in revenue and EBITDA.

Future investment decisions will be taken in line with the stated strategy of maintaining a good balance with net financial debt. Capital expenditure levels will be determined on an appropriate selective basis to underpin solid earnings growth for the Messer Group. At present, favorable investment opportunities beckon in China and Vietnam. Suitable opportunities to expand production capacities are also available in Eastern Europe.

Forward-looking assertions

The Outlook Report contains forward-looking assertions which are based on the management's current appraisal of future developments. These assertions are not to be interpreted as a guarantee that these expectations will in fact be met. Future business performance and earnings of the Messer Group are dependent upon a number of risks and uncertainties and may therefore diverge significantly from the forward-looking assertions made here.

Opportunities report

As an international supplier of industrial gases, opportunities basically arise for the Messer Group from the multifarious usages of industrial gases to produce products needed in all fields of life and in all countries of the world. Through investment, we are able to exploit available opportunities to realize the full potential of the business and to maintain/ strengthen our market position. We are also taking advantage of the opportunities arising from internationalization – in particular in the light of positive developments on the emerging economies – by expanding our facilities in these regions. This also enables us to engage in new markets with long-term growth potential. We encourage the identification of new opportunities by embedding employee motivation in the Group's corporate values and by fostering ideas management.

The main opportunities which could be significant for the net assets, financial and earnings position of the Messer Group are as follows:

Macroeconomic opportunities

The general economic environment plays an important role for our operations, our financial and earnings position and our cash flows. Our forecast for 2019 is based on the expectation that future macroeconomic conditions correspond to the description provided in the Outlook Report section of the management report. If the world economy as a whole or in regions or countries of relevance for our business performs better than described, our revenue and earnings could exceed the forecasted amounts.

Market opportunities

Our forecasts continue to incorporate continued significant market growth, particularly in China, but, for the purposes of the outlook for 2019, have not assumed any further increase in the growth rate. A sharp economic upswing could have a positive impact on revenue and earnings.

We anticipate a slowdown in the growth rate in Europe. A faster economic recovery in specific countries or a general economic upturn could have a positive impact on revenue and earnings.

Opportunities arising from industrial gases applications

Our products are used worldwide in a variety of production processes. In the field of application technology, the Messer Group continuously analyzes multifarious processes in order to facilitate more efficient production processes for our customers through the use of industrial gases. New applications identified in this way may open up new business opportunities which could have a positive impact on revenue and earnings.

Opportunities arising from optimization measures

Where necessary, the Messer Group implements targeted optimization measures to support business performance. If the various measures are implemented more quickly or more successfully, this could have a positive impact on revenue and earnings.

Opportunities created by our employees

The Messer Group promotes "ideas management" throughout the group and employees are encouraged to submit improvement proposals with local and/or international relevance. Furthermore, human resources development programs and other training offers are available to encourage the systematic development and exploitation of our employees' potential. If we achieve better progress with these measures and methods than currently expected, this could have a positive impact on revenue and earnings.

Risk Report

As an international supplier of industrial gases, the Messer Group is exposed to opportunities and risks which inevitably arise in connection with entrepreneurial activities. Moreover, future earnings will depend both on the operating performance of the gases business and on the state of the economies in individual countries, a factor over which the Messer Group has no influence.

The main risks which could be significant for the net assets, financial and earnings position of the Messer Group are as follows:

Macroeconomic risks

The industrial gases business is subject to intense competition. The level of competition is increasing in conjunction with the process of globalization. This highly competitive environment could reduce Messer's earnings and cash flows in the future. The Messer Group operates globally, making it susceptible to local political, social and economic conditions and to the resulting risks arising in each market.

Market risks

We supply a cross-selection of industries and sectors (including steel, metal processing, chemicals, petrochemicals, food and beverages, healthcare and glass) on the basis of long-term contracts over periods of up to 15 years in Europe and up to 30 years in Asia. A significant reduction in market demand in any one of these key industries or sectors – particularly given the prevailing critical situation in the steel industry which is suffering from worldwide over-capacity – could adversely affect future earnings. Our strong position in China also means that this region generates 49 % of sales of continued operations and makes an above-average contribution to earnings, and conversely, that any economic downturn on this market cannot be fully compensated by improved performance in other markets. We currently classify market risks as medium. At the same time, we are aware that, following Messer's entry into the U.S. market, we could in future also be affected by measures – some of them far-reaching – as a result of any escalation in the trade conflict between the USA and China.

Cost risks

Regulatory or government amendments or interventions in the energy sector may lead to rising energy prices in some countries. The re-occurrence of crisis situations within oil-producing countries and the growing demand for energy in emerging economies, particularly in China and India, give reason to assume oil and energy prices will continue to show a rise trend, with a corresponding impact on supplies and primary products necessary for the Messer Group's business. Purchase prices of some important bought-in products, such as helium, fluctuate considerably. Although Messer is often able to pass on cost increases partially to its customers via price escalation clauses in supply contracts (in particular for electricity price

increases) or reduce the risk by entering into long-term purchase agreements, it is possible that price increases for energy and bought-in items could adversely affect the profitability of the Messer Group. We currently classify cost risks as high.

Selling price risks

The intense competition may lead in certain countries to disproportionate downward price trends which could have a negative impact on future revenue and earnings. The integration of member states which have only recently joined the EU entails risk in that many previously state-run businesses will need to be privatized and restructured in accordance with EU and International Monetary Fund requirements. The number and scale of state grants could be drastically reduced, culminating in numerous closures and mergers in these countries, and an adverse impact on the Group's revenue. In these circumstances, the downward pressure on selling prices would probably increase. We currently classify selling price risks as medium to high.

Operational risks

An operational interruption at one of our production facilities can result in loss of supplies to customers. We endeavor to avoid this situation by regularly maintaining and monitoring our equipment. In the event of breakdowns or defects, emergency plans and instruments are in place to reduce the financial consequences of a business interruption at one of our customers. The Messer Group is currently expanding its supply structure and maximizing flexibility in order to ensure that supplies to customers are safeguarded even in emergency situations. The range and quality of our products depend on the availability of bought-in hardware and on the production equipment used (e.g. cylinders and tanks) on the one hand and on the quality of service/products of our suppliers and business partners on the other. We currently classify operational risks as medium.

Acquisition risks

The Messer Group is continually developing new strategies. As well as expanding and strengthening our existing business and continually optimizing our sourcing and logistics processes, we are intent on achieving growth both organically and through other means such as acquisitions and joint ventures. Our aim is to consolidate operations on existing markets and to divest non-core business operations. The sale of entities or business activities can, however, result in retrospective risks for the Group. Appropriate provision is recognized if a risk is probable. When deciding to make acquisitions or entering into new partnerships there is always a risk that future market potential and the feasibility of projects being put into action may have been wrongly predicted. The Messer Group therefore has internal committees which analyze the development potential of a project prior to its approval and work through any information that has a bearing on decisions which need to be made. In order to be as certain as possible that M&A projects have future development potential, due diligence investigations are carried out by experienced staff in specialist departments before any acquisitions are made in connection with M&A projects. Risk is also reduced by including relevant terms of agreement in purchase contracts. We currently classify acquisition risks as medium.

IT risks

The use of state-of-the-art information technology plays a decisive role in handling and securing business processes within the Messer Group. Our IT center in Germany provides the scope to create a modern and efficient infrastructure and to improve our business processes where necessary. This concentration does, however, mean that there is a greater risk of business interruption, cyber criminality and sabotage, caused by natural hazards or human error. In order to avoid this risk, our IT center applies its own IT risk management system, including ongoing testing of the system architecture. Particular attention is paid to the provision of IT infrastructure and services and especially to guaranteeing fail-safe and interference-free operations. The integrity and reliability of the data and important information are ensured by means of appropriate measures, services and systems. Most of the business processes of the Messer Group are provided by internal or external IT services. The security and compliance of the information systems are set out in the IT strategy objectives, on the basis of which Messer Group GmbH designs, implements and reviews measures to ensure protection of data, applications, systems and networks on an ongoing basis. Both preventive and corrective measures are considered in this process. We currently classify IT risks as medium.

Financial risks

We require funding to finance our growth and investments. We are therefore dependent on the finance sector remaining stable and liquid. The Messer Group is reliant on cash flows from operating activities to repay debt. This is dependent to a large extent on the ability to generate positive cash flows from operating activities.

The Group has recognized goodwill in the consolidated balance sheet. The application of IAS 36 (i.e. the performance of impairment tests) could result in the requirement to recognize impairment losses on goodwill, if the business and market prospects of a group subsidiary or cash-generating unit deteriorate compared to the original date of measurement. Impairment losses could have a significant adverse impact on earnings and on balance sheet/ performance ratios. In China, the steel industry is in a state-run restructuring process which may lead to the closure of individual production sites. The resulting uncertainties were taken into account in the forecast through corresponding allowances on receivables and scaled-back business assumptions.

There is always a risk that financial and debt crises could result in global economic downturns or slowdowns. The Messer Group will closely monitor current developments and, if necessary, counteract them with cost and investment saving programs. A potential deterioration in the creditworthiness of our customers increases the risk of bad debts and delay of joint projects.

It is essential that we ensure compliance with the covenants attached to the USPP and RFA financing arrangements. Particularly worthy of mention is the net debt (i.e. gross debt less liquid funds)/EBITDA covenant which is required to be complied with for the Messer Group as a whole and for the Messer Group excluding its subsidiaries in China. Financial risks can also arise for the Messer Group from changes in exchange and interest rates. The management of interest rate, currency and liquidity risks is handled by Group Treasury in compliance with guidelines approved by executive management. Group Treasury identifies, measures and hedges financial risks. The Messer Group currently employs marketable forward currency contracts, interest rate swaps and cross-currency interest rate swaps as hedging

instruments. Treasury guidelines contain general risk management principles and specific rules for defined areas such as the exchange rate risk, interest rate risk, the use of derivative financial instruments and the investment of surplus cash. The related risks are observed continuously, and the scope of hedging adjusted where considered necessary. We currently classify the impact of financial risks on a relevant scale as low to medium.

Currency risks

Transaction risks arising in conjunction with the export of products are generally hedged as soon as the order is received. At an operating level, for the most part the individual Group entities transact their business locally in their functional currency. For this reason, the currency risk element of transaction risks is generally considered to be low. However, some Group entities are exposed to foreign currency risks that arise on transactions that are not denominated in their functional currency. These transactions relate mainly to payments for imported products or services and are hedged to the maximum extent possible. Like any other market participant, we may be confronted with the unexpected appreciation of a functional currency which weakens the international competitiveness of the country in terms of its ability to export products as well as our local operations. Translation risks which may arise when converting foreign currency exposures into euro are classified as customary for the business. Exchange rate losses against the euro can lead to a reduction in Group equity as a result of valuing our foreign currency-denominated net asset positions in the relevant countries. We currently classify currency risks as low.

Legal and contractual risks

Enterprises are confronted from time to time with allegations that they have infringed industrial rights or legal obligations, that defective products have been supplied or that environmental protection laws have not been adhered to. Regardless of their prospects of success, this type of claim can result in very high defense costs. In cases like these, the Messer Group defends itself energetically with the support of both in-house and external experts.

Our international operations are subject to a wide range of country-specific environmental legislation and regulations in areas such as gas emissions, groundwater pollution, the use and treatment of dangerous substances as well as ground surveys and decontamination. This can give rise to liability risks in conjunction with either past or current operations. New environmental requirements, partially resulting from the adoption of EU directives in the new EU Member States, necessitate that our existing environmental standards are brought from time to time into line with the new requirements. This may result in higher production costs and modifications to the production process. The recent past shows, however, that the implementation of stricter environmental regulations often results in a more efficient production process and a higher quality product. We currently classify legal and contractual risks as medium.

Overall conclusion

The above-mentioned opportunities show that both internal and external potential are involved. We endeavor to develop in-house potential on a targeted basis and will put external potential to good use whenever the opportunity arises. The risks presented above are not the only ones to which the Messer Group is exposed. Some risks, which have not yet been identified or which are not considered to be significant from today's perspective could have an adverse impact on the Messer Group if general business or economic conditions were to change. However, no risks were identified in 2018, either individually or in aggregate, which could have a material adverse impact on the going-concern status of the Messer Group. From today's perspective, no such risks are pending in the foreseeable future. Market developments and production remained the principal operational risks during the period under report. Organizational measures are in place to identify potential risks at an early stage. Our vigilant risk management system (described below) and pro-active management of risks enable us to reduce risk.

Risk management

The principles that dictate our approach to risk management are stipulated by the Executive Management. Risk management is directed at safeguarding the going-concern status of group entities and increasing the value of the business; for this reason, it plays a crucial role in all decision-making and business processes. The existing management structure and the reporting processes which are in place throughout the Messer Group ensure that not only developments that could jeopardize its going-concern status are reported regularly and in good time to the relevant levels, but also that other developments which pose a threat to the achievement of short-term performance targets (such as EBITDA or cash flow) are reported. This allows management to initiate measures at an early stage to mitigate any operating and/or financial risks. Risk managers have been designated at each of the subsidiaries with responsibility for ensuring the proper functioning of local reporting systems. Working together with local risk managers, the Messer Group Risk Manager prepares a risk report at the start of each year which is discussed by the Executive Management and communicated to the Supervisory Board of Messer Group GmbH in good time. The risks recorded in the risk report are categorized by nature and classified by probability of occurrence. The risk profile during the financial year 2018 did not change significantly compared to the previous year.

Messer is adequately insured against potential claims or liability risks, to which it is exposed; these policies ensure that the financial impact can be kept within defined limits or completely avoided. The scale of insurance coverage is continuously optimized in response to the specific situation of group companies.

The Messer Group GmbH's internal audit department and the centralized organization of Messer China carried out ten status audits (nine follow-up audits/one first-time audit) at Messer Group companies during 2018. The audits by the internal audit department at the same time include advisory activities in the sense that information on best practice is passed on and cross-border assistance is organized; this takes account of the respective current standards of the entities in the various countries. In addition, a regular exchange of information takes place with the external auditors in order to make the best use of available know-how, on a results-oriented basis, during the respective audits. Where necessary, other central functions are also

called upon in an advisory capacity (including SHEQ, Corporate Logistics, Central Sales Functions). Compliance with corporate guidelines is tested and sample testing of voucher/document controls performed within the various business processes, in order to check the effectiveness and commercial sense of processes as well as the accuracy and reliability of financial reporting. Findings were clarified and recommendations made to improve the transparency of business processes. The Supervisory Board of the Messer Group regularly reviews the quality and appropriate intensity of the audits.

The Group's Safety, Health, Environment, Quality (SHEQ) department continues to carry out audits and risk analyses in order to reduce the accident ratio even further.

State-of-the-art technologies are employed in the IT area in order to keep the risk from electronic data processing to a minimum. Unauthorized access to data and systems and a significant loss of data are ruled out to the greatest extent possible. The efficiency, operational availability and reliability of systems are constantly being monitored and improved. Messer's security concept also includes a detailed emergency plan. In order to minimize risks, the various technologies employed by the Messer Group are regularly tested to ensure that IT-based business processes are safe.

Tax laws and competition regulations can also give rise to business risks. In order to mitigate these risks, the Company relies upon the advice of both in-house and external experts.

Income and operating cash flows are, to a large extent, unrelated to market interest rates, since the Group does not hold any significant interest-bearing assets. Loans or credits subject to variable interest rates are hedged partly with the aid of interest rate swaps (cash flow hedges of future interest payments). Under these arrangements, loans with variable interest rates are converted in substance to ones with fixed or maximum rates. In conjunction with the interest rate swaps, the difference between fixed contract interest rates and variable interest rates is settled at specified intervals (computed by reference to an agreed amount). At the balance sheet date, derivative financial instruments had only been entered into with renowned international financial institutions.

Corporate Governance at Messer Group GmbH encompasses a whole range of in-house rules and measures aimed at preventing the occurrence of risks. The first stage of the risk management system is to assess risks throughout the organization. This risk assessment is conducted by the Group's corporate departments for the respective areas of responsibility and by each consolidated subsidiary for its own business. The assessment of risks is updated each year. All information relating to risks is collated centrally by the Corporate Compliance Officer (CCO). Training is organized and carried out as appropriate to cover identified risk areas and to highlight best practice for avoiding the occurrence of a risk as far as possible. Messer Group GmbH has mandatory compliance guidelines in place for its companies, including in particular the „Code of Conduct“ and „Group Guidelines“. All first and second-tier managers of Messer Group GmbH and its consolidated subsidiaries have confirmed that they have received these guidelines, examined their content and comply with the regulations contained therein. Furthermore, all employees have been informed of the content of compliance guidelines of relevance to them and have also confirmed compliance with them. Management and staff are regularly informed about, and receive training on, the content of these guidelines, other policies and code of conduct rules.

On the basis of a matrix structure, the Compliance department cooperates closely with the SHEQ, Medical, IT, Audit, Legal and Insurance departments. Internal audits are carried out to check that compliance guidelines – in particular the Group Guidelines – have been appropriately implemented, thus ensuring good risk management procedures throughout the organization, including conduct and reporting rules, the requirement for approval at the appropriate level as well as application of the dual control principle for legally binding agreements with third parties. Incidences of non-compliance are followed up and the appropriate actions taken where necessary. At the same time, any such incidences are used to reflect on how additional preventive measures could reduce the risk of non-compliance in the future.

The annual compliance report drawn up by the COO for the Executive Board is also discussed with the Supervisory Board.

Bad Soden am Taunus, March 26, 2019

Messer Group GmbH

Consolidated Balance Sheet

of Messer Group GmbH, Sulzbach/Taunus, as at December 31, 2018 (in K€)

		Dec. 31, 2018	Dec. 31, 2017
Assets	Intangible assets	343,085	386,491
	Property, plant and equipment	889,637	1,099,201
	Investments accounted for using the equity method	43,407	50,124
	Investments in other companies and financial investments	4,648	4,150
	Deferred tax assets	14,989	16,310
	Finance lease receivables	122,296	136,815
	Other non-current financial assets	2,735	878
	Non-financial assets	833	454
	Non-current assets	1,421,630	1,694,423
	Inventories	43,687	58,939
	Trade receivables	137,982	191,809
	Income tax assets	836	1,992
	Other current financial assets	38,295	36,103
	Non-financial assets	27,054	32,901
	Cash and cash equivalents	277,476	176,014
	Current assets	525,330	497,758
Held-for-sale assets	458,437	13,845	
Total assets	2,405,397	2,206,026	
Equity and Liabilities	Subscribed capital	100,000	100,000
	Capital reserve	536,937	536,937
	Other reserves	1,446	45
	Revenue reserves	639,297	537,561
	Other components of equity	21,128	17,637
	Equity attributable to owners of the parent company	1,298,808	1,192,180
	Non-controlling interests	173,852	152,734
	Equity	1,472,660	1,344,914
	Provisions for employee benefits	44,638	55,758
	Other provisions	5,491	7,091
	Non-current financial debt	327,679	419,634
	Deferred tax liabilities	29,586	30,780
	Non-current liabilities	407,394	513,263
	Other provisions	27,039	30,943
	Current financial debt	214,088	61,829
	Trade payables	90,445	130,165
Income tax liabilities	18,849	14,176	
Other current financial liabilities	17,351	29,214	
Non-financial liabilities	58,397	78,733	
Current liabilities	426,169	345,060	
liabilities held for sale	99,174	2,789	
Equity and liabilities	2,405,397	2,206,026	

Consolidated Income Statement

of Messer Group GmbH, Sulzbach/Taunus, for the Year Ended December 31, 2018 (in K€)

	Jan. 1 – Dec. 31, 2018	Jan. 1 – Dec. 31, 2017 adjusted
Revenue	1,010,444	902,189
Cost of sales	(555,147)	(505,764)
Gross profit	455,297	396,425
Distribution and selling expenses	(192,140)	(192,159)
Impairment gains/losses on trade receivables and contract assets	2,466	(1,795)
General administrative expenses	(86,556)	(84,342)
Other operating income	25,881	18,389
Other operating expenses	(8,416)	(6,616)
Impairment losses on goodwill	(4,634)	(4,725)
Operating profit	191,898	125,177
Income from investments accounted for using the equity method	(4,678)	(2,919)
Other investment results, net	(86)	(62)
Interest income	2,960	1,127
Interest expense	(23,197)	(18,396)
Other financial result, net	(4,755)	(4,327)
Financial result, net	(29,756)	(24,577)
Result from continuing operations before tax	162,142	100,600
Income taxes	(44,675)	(27,914)
Result from continuing operations after tax	117,467	72,686
Result from discontinued operations after tax	20,572	10,977
Group net profit for the year	138,039	83,663
Of which attributable to:		
shareholders of the parent company	101,460	59,864
non-controlling interests	36,579	23,799

Consolidated Cash Flow Statement

of Messer Group GmbH, Sulzbach/Taunus, for the Financial Year 2018 (in K€)

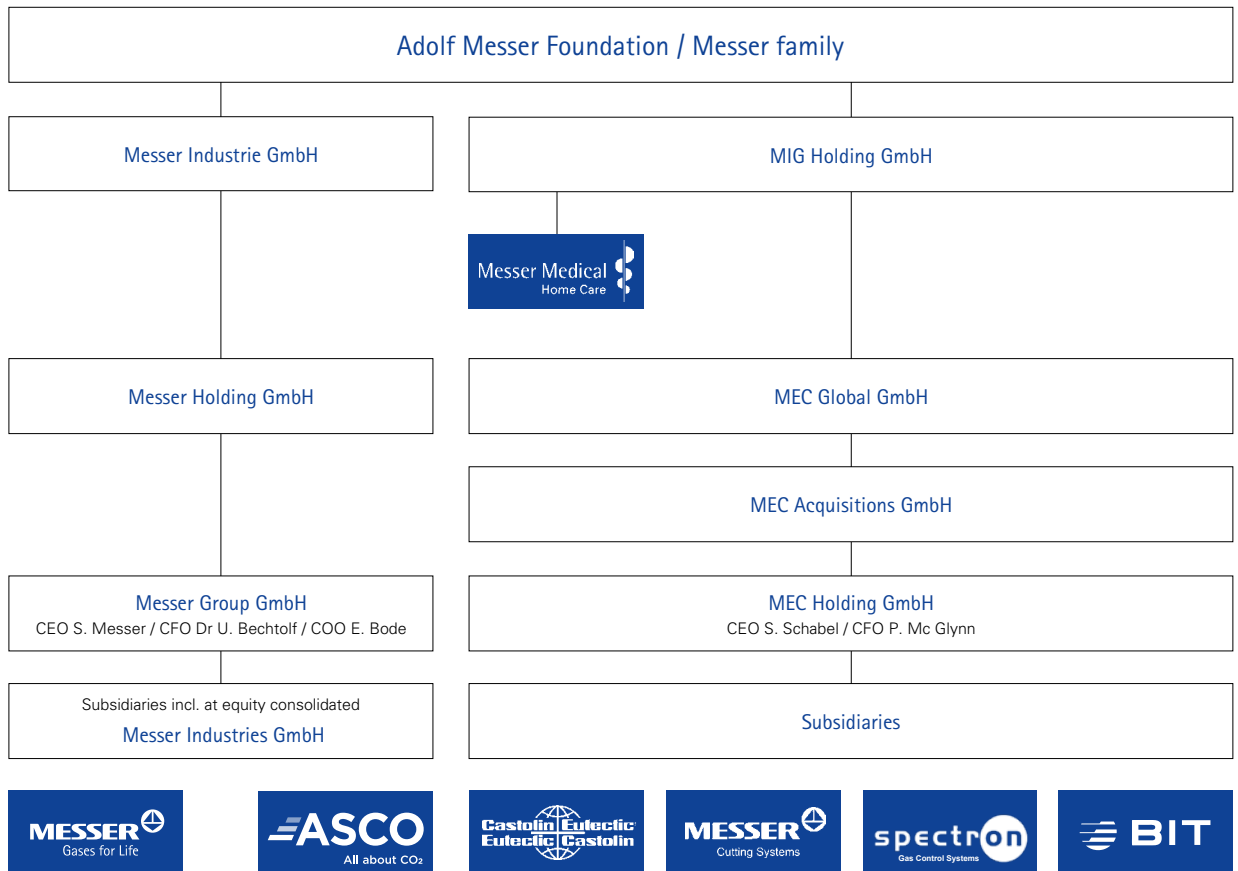
	Jan. 1 – Dec. 31, 2018	Jan. 1 – Dec. 31, 2017
Group profit before tax	187,582	113,145
Income taxes paid	(42,268)	(24,121)
Depreciation, amortization and impairment losses on property, plant and equipment and intangible assets	142,913	150,704
Impairment losses on non-current financial assets	129	18
Gains arising as a result of changes in the group reporting entity	(8,477)	–
Loss / (gains) on disposals of fixed assets	(1,683)	(57)
Changes in investments in associated companies	4,466	2,773
Interest result, net	22,673	18,647
Other non-cash financial result	8,918	9,664
Changes in assets resulting from finance lease arrangements (IFRIC 4)	14,176	22,062
Changes in inventories	4,464	(7,664)
Changes in receivables and other assets	(15,942)	(7,827)
Changes in provisions	4,642	9,475
Changes in trade payables and other liabilities	705	(5,585)
Cash flows from operating activities	322,298	281,234
Purchase of property, plant and equipment and intangible assets	(231,921)	(142,264)
Purchase of investments and other non-current assets	(1,721)	(46)
Disbursements for the acquisition of subsidiaries	(7,494)	(1,566)
Capital reductions at the level of associated companies	(196)	449
Proceeds from disposals of property, plant and equipment and intangible assets	2,721	2,944
Proceeds from disposals of subsidiaries and loans	20,303	1,817
Interest received	2,932	1,206
Cash flows from investing activities	(215,376)	(137,460)
Changes in capital by shareholders of Messer Group GmbH	–	(5,000)
Proceeds from non-current financial debt	70,909	18,712
Proceeds from current financial debt	6,511	15,791
Repayments of non-current financial debt	(5,221)	(4,158)
Repayments of current financial debt	(28,628)	(53,133)
Dividends paid to non-controlling interests	(20,224)	(20,759)
Decrease/ (increase) of majority shareholdings without loss of control	4,144	–
Amounts paid in by other shareholders	3,837	–
Interest paid	(19,260)	(19,509)
Other financial result, net	(3,143)	(10,179)
Cash flows from financing activities	8,925	(78,235)
Changes in cash and cash equivalents	115,847	65,539
Cash and cash equivalents		
at the beginning of the period	176,014	113,984
Exchange rate impact on cash and cash equivalents	(590)	(2,465)
Cash classified as held for sale	(13,795)	(1,044)
at the end of the period	277,476	176,014

Messer World

Along with Messer Group and ASCO Carbon Dioxide, "Part of the Messer World" also includes the business areas of the sister companies Messer Cutting Systems, Castolin Eutectic, BIT and Spectron Gas Control Systems – as well as Messer Medical Home

Care. They all offer application-specific expertise and products which help optimise manufacturing processes, extend the life of production equipment and materials, or significantly enhance quality.

Organisational structure



ASCO CARBON DIOXIDE LTD

Technology innovation and establishment in the US market

In 2017, the Swiss company ASCO launched a new generation of dry ice blasting machines: The ASCO Nanojet is small and handy and was specially developed for the plastics industry. For the new dry ice blasting machine, the engineering team at ASCO has integrated a pellet grinder into the machine body which crushes the dry ice pellets into finest dry ice particles. With the ASCO Nanojet, much smaller pellets are blasted on the surface being cleaned. This ensures a precise, fast and consistent surface cleaning. In addition, the US subsidiary ASCO Inc., which was founded in 2016 and is headquartered in Jacksonville, Florida, successfully established itself in the US market. Continuing to provide optimal on-site customer care and rapid availability of dry ice machines to US customers, ASCO Inc.'s staff structure has been further strengthened. Also, ASCO was able to gain Kryo Africa as a qualified service partner for repair and maintenance work in Africa. Thanks to the expanded service network, a flexible and fast on-site customer support in the English-speaking African countries can be ensured.

Positive outlook

ASCO is going to continue with the ongoing optimisation of the product portfolio in the coming years. Especially in the field of CO₂ recovery, the implementation of further large-scale projects is intended to demonstrate the market position.

Broad product portfolio

ASCO CARBON DIOXIDE LTD is a provider of customised and complete CO₂ solutions. The product portfolio includes automatic dry ice production machinery, CO₂ production

plants and recovery systems, dry ice blasting equipment, CO₂ storage tanks, CO₂ cylinder filling plants, CO₂ vaporisers and other CO₂ accessories. Product development and service are built on two solid foundations: decades of practical experience in everything pertaining to CO₂ and dry ice, and a highly qualified and dedicated workforce. This unique combination of extensive expertise and broad product portfolio provides our customers with complete and customised solutions from a single source. Messer relies on ASCO as its competence centre for CO₂ and dry ice.

www.ascoco2.com



Messer Eutectic Castolin Group

The Macroeconomic Environment and its Impact on Business Strategy

The global activities of the Messer Eutectic Castolin (MEC) Group encompass four divisions operating in different industries. All of these companies are technology leaders in their sector. Our various products, services and technologies can be used and applied across many different manufacturing areas.

We supply materials to prevent wear of industrial machinery and installations, thereby extending the service life of large industrial facilities.

We actively contribute to the conservation of resources and the reduction of energy consumption, bringing sustainable environmental protection to areas where one would not, at first glance, expect it.

We offer individual solutions to meet our customers' different gas supply system requirements. All our products ensure a reliable and efficient supply.

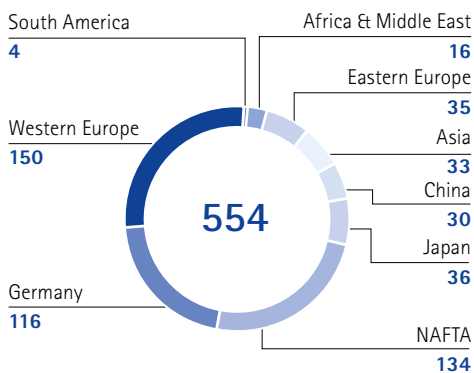
We do not want to rest on our laurels, so we are constantly developing and refining the technologies used in our metal cutting machines: our machines' increasingly automated production processes deliver efficiency improvements for our customers. Thanks to high levels of quality and reliability, excellent service and an optimised overall cost structure, our machines are the undisputed market leader in thermal cutting.

Our medical diagnostic devices have been improving people's quality of life for years. They determine blood parameters, diagnose illnesses and help doctors develop treatment options.

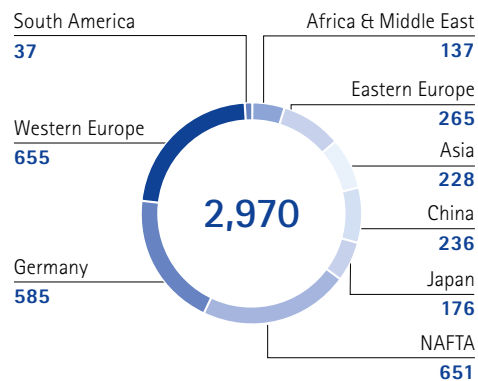
2018 was a very successful year for the MEC Group. We managed to increase our consolidated sales by three per cent to 554 million euros. At the same time, we were able to invest in our future. Consistent process and product improvements contribute towards the Group's stable earning power. We maintain a firm focus on external customers and markets while at the same time supporting internal change processes through a number of corporate culture projects.

Key figures 2018

Sales of MEC Group by region in million of euros as of 31.12.2018



Number of MEC Group employees by region as of 31.12.2018



Castolin Eutectic

Value Creation in Key Industries

Castolin Eutectic has been continuously building expertise in wear and material loss in manufacturing processes for over 100 years. The company is a worldwide leader of application solutions in maintenance, repair and wear protection. Castolin Eutectic is globally active in all industrialised nations. The company's geographic diversification is mirrored by its diversification in various industries. An international team of over 400 application specialists develops innovative solutions in selected key industries and sectors such as cement, iron and steel or oil and gas. The focus is on developing welding and brazing technologies as well as thermal coating. The relatively young market segment "Services" offers our customers process applications in our own workshops with higher added value. Among other things, we want to strengthen customer loyalty with this service. We want to further expand our activities in the boiler coating segment, one of the cornerstones of our growth strategy in the energy, waste-to-energy and petrochemical industries.

Castolin Eutectic always operates production facilities as close as possible to the respective customers. Its manufacturing and service centres are located in Ireland, Poland, France, Italy, China, Singapore, the UK, UAE/ Dubai, USA, Canada, Mexico and Russia.

The company further operates service workshops at numerous sites for various industrial applications in the areas of welding, soldering and thermal coating.

Castolin Eutectic was able to increase its total sales by four per cent in the fiscal year 2018.

www.castolin.com, www.eutectic.com



Messer Cutting Systems

World of Excellence

Messer Cutting Systems has been developing and producing machines for cutting steel for over 100 years. Our machines are needed whenever thick material must be cut and we are seeing promising potential for a continued expansion of our business activities. There is a positive correlation between the globally produced volume of thick steel and the capacity utilisation of our customers. An increased output of steel and steel products will have a positive impact on our markets. There is also a clear link between the replacement and spare parts business and the steel processing industry. Here, too, a higher steel production level makes a positive contribution to our markets. Messer Cutting Systems continued to consistently develop its products. We are the market leader with our oxyfuel and plasma cutting machines. In 2018, we were able to present the latest generation of laser cutting machines, which we expect to be a further source of impetus in the coming years.

The ongoing automation in our customers' plants makes it possible for our machines to be increasingly connected to automated material logistics systems. Automated and autonomous machines bring considerable efficiency gains to our customers in terms of cost saving potential. This trend allows us to widen our product range geared towards processes upstream and downstream from cutting. Electronically linking all these processes, often also labelled as "Industry 4.0" enables our customers to centrally control, monitor and optimise their production. This will lead to consequences for software and networking which in turn will continue to change our industry in the years to come. Ongoing digitalisation has created an increasing interconnection between

previously separate value chains. We are already embracing this development as an opportunity and successfully implementing it in our Group. Innovations and enhancement of existing products are among the core drivers for success in safeguarding our market position.

We have continued to rigorously pursue our strategic investment initiative with the aim of further enhancing harmonisation of the product portfolio and internal business processes.

Messer Cutting Systems has production plants in Germany (headquarters), USA, Brazil, India and China. All our production sites operate with state-of-the-art technology. Extending our product lines by adding a wide range of smaller machines will enable us to address new potential customers for our products.

www.messer-cs.com

MESSER 
Cutting Systems



Spectron Gas Control Systems

Innovative Manufacturer of Gas Control Systems

Spectron is a leading and innovative gas supply specialist for gas supply systems, offering customised solutions for a wide range of customer-specific requirements. Spectron covers clients' requirements from a simple valve for industrial gases up to fully automatic gas cabinets for semiconductor gases. The company also supplies alarm and control systems for gas applications, as well as gas purification systems to improve or secure the purity of the gases.

In addition to the headquarters based in Frankfurt, Germany, production and distribution centres are operated in Coventry, UK, and Shanghai, China. In 2018, we acquired a new location in Singapore from which we want to improve our business development in the South-East Asian market in future.

With its global network of sales and distribution partners, Spectron is always close to its customer. The company's sales and result performance is characterised by steady growth.

www.spectron.de



BIT Group

Build Innovation Together

BIT develops and manufactures in-vitro diagnostic medical devices for the medical and diagnostic sectors. These technologies have made significant advances in recent years. The decoding of human DNA has resulted in the development of new areas of application and rapidly expanding treatment methods. BIT profits from these trends as the company develops and produces the instruments needed to carry out modern analysis and diagnostic procedures.

BIT Group operates production sites in Germany, USA and China, all of which are ISO 13485 certified. In order to constantly improve our products, our experts in Germany, France and the USA carry out continuous research and development work on new technologies. The company focuses on products in the areas of haematology, clinical chemistry and molecular diagnostics. Instruments and devices developed and/or manufactured by BIT are used in some 35,000 laboratories. Altogether, we have manufactured and delivered over 170,000 devices.

www.bit-companies.com



Messer Medical Home Care

Broad portfolio for the home care sector

Messer Medical Home Care Holdin (MMHCH) offers products and services to prescribers and patients in selected European countries. These product and service offerings allow oxygen therapy at home, therapy for sleep apnea, monitoring for sudden death syndrome with small children, ventilation support and all training measures connected to these therapies.

Treating patients at home is key to health care systems across the world. It alleviates the strain on resources deployed in hospitals. Therefore home care is a solution for health care payers to manage cost and resources in a world whose population is ageing.

Focus on home care

Within the Messer World, MMHCH concentrates solely on the home care area. In the past, these activities were integrated separately at

Messer, which made it difficult to focus and align them clearly.

We will continue to develop and market innovative solutions for patients, doctors and health authorities. We expect this to give us a sustainable and leading position in this emerging health sector. MMHCH currently has around 140 employees working day in day out dedicated to this mission.

www.messer-medical.at



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 Greg Vanes, Munich
 Context Gesellschaft für Sprachen-
 und Mediendienste mbH, Cologne

Our commitment in climate protection also extends to this sustainability report: We support a CO₂ reduction project in the bvd m's (Bundesverband Druck und Medien) climate initiative with the goal of reducing flue gas emissions in Kenya and at the same time support water treatment.

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



