ANNUAL REPORT 2019

engineering for a better world

GEA brings transitional year to a successful conclusion but expects a earnings decrease due to coronavirus in 2020

Restructuring measures implemented quicker than originally planned, and already reflected in earning results

Order intake and revenue both at record levels despite difficult market environment for engineering companies

EBITDA before restructuring measures (EUR 479 million) at upper end of predicted corridor despite special effects (about EUR 41 million)

Net financial position (EUR 28 million) up by EUR 100 million on previous year

Working capital reduced significantly

No change to proposed dividend (EUR 0.85 per share)

Outlook for 2020 with the economic consequences of the coronavirus now foreseeable, GEA expects revenue to be just under the previous year's level, with EBITDA before restructuring measures at between EUR 430 and EUR 480 million and a ROCE between 9.0 to 11.0 percent.

IFRS Key Figures of GEA

(EUR million)	2019	2018	Change in %
Results of operations			
Order intake	4,931.1	4,917.7	0.3
Book-to-bill ratio	1.01	1.02	–
Order backlog	2,412.4	2,416.3	–0.2
Revenue	4,879.7	4,828.2	1.1
EBITDA before restructuring measures[1]	479.2	539.1	–11.1
as % of revenue	9.8	11.2	–
EBITDA (IFRS)	374.4	431.2	–13.2
EBIT before restructuring measures[1]	271.4	309.1	–12.2
as % of revenue	5.6	6.4	–
EBIT (IFRS)	–109.1	259.8	–
EBT (IFRS)	–125.5	230.7	–
Profit for the period (IFRS)[2]	–170.7	113.5	–
ROCE in % (goodwill adjusted)[3]	10.6	11.6	–
Net assets			
Net working capital (reporting date)	682.0	747.0	–8.7
as % of revenue (LTM)	14.0	15.5	–
Capital employed (reporting date)	2,141.1	2,396.6	–10.7
Equity	2,090.1	2,449.4	–14.7
Equity ratio in %	36.6	42.8	–
Leverage[4]	–0.1 x	0.2 x	–
Net liquidity (+)/Net debt (–)	28.4	–72.2	–
Financial position			
Cash flow from operating activities	483.2	268.0	80.3
Cash flow from investing activities	–141.0	–146.4	3.7
Free cash flow	342.2	121.6	> 100
GEA Shares			
Earnings per share (EUR)[2]	–0.95	0.63	–
Weighted average number of shares outstanding (million)	180.5	180.5	–
Market capitalization (EUR billion; reporting date)	5.3	4.1	31.0
Employees (FTE; reporting date)	18,490	18,642	–0.8
Total workforce (FTE; reporting date)	20,075	20,615	–2.6

1) Pro-forma figures for 2018 incl. IFRS 16 effects from 2019.
2) First half of 2019 incl. interest income of EUR 32.7 million due to adjustment of the interest calculation method used to measure provisions for long-term liabilities (see page 224 f.).
3) Capital employed excluding goodwill from the acquisition of the former GEA AG by former Metallgesellschaft AG in 1999 (average of the last 4 quarters); pro-forma figures for 2018 incl. IFRS 16 effects from 2019.
4) Total net debt/cons. EBITDA based on frozen GAAP (covenant concept).

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Cover image
At its technology centers, GEA develops and tests the latest product solutions – sometimes in conjunction with customers and suppliers. The image shows a continuous-motion, high-speed vertical packaging system undergoing testing. The machine is designed for pillow-bag packaging for bagging small cookies and savory snacks, candy, dried fruit, and nuts, for example. An important feature is the use of more sustainable paper packaging instead of the customary plastic film – a technically challenging task, given paper behaves very differently than film.

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Fiscal year 2019

Fiscal year 2019 was a year of profound change for GEA. The measures introduced by the group helped shift cash flow well into positive territory, with earnings stabilizing again. The group met and, to some degree, even exceeded its targets for revenue, earnings and return on capital employed, thus establishing a solid basis for fiscal year 2020.

REVENUE	EBITDA before restructuring measures	ROCE
With revenue actually rising by 1.1 percent to EUR 4.88 billion, original forecasts predicting that this indicator would be below the prior-year level failed to materialize.	Despite the added strain of certain negative effects, earnings in 2019 reached EUR 479 million – the upper end of the predicted corridor (EUR 450 – 490 million).	With ROCE of 10.6 percent, GEA bettered its own prediction which was between 8.5 to 10.5 percent.

GEA at a Glance

GEA is one of the largest suppliers for food processing technology and of related industries. The global group specializes in machinery, plants, as well as process technology and components. GEA provides sustainable solutions for sophisticated production processes in diverse end-user markets and offers a comprehensive service portfolio. The company is listed on the German MDAX (G1A, WKN 660 200), the STOXX® Europe 600 Index as well as the DAX 50 ESG Index and selected MSCI Global Sustainability Indexes. With an "A-" rating, GEA is among the leading group in the climate benchmark Carbon Disclosure Project.

4,931
EUR million order intake

18,490
Employees (Full-time equivalents)

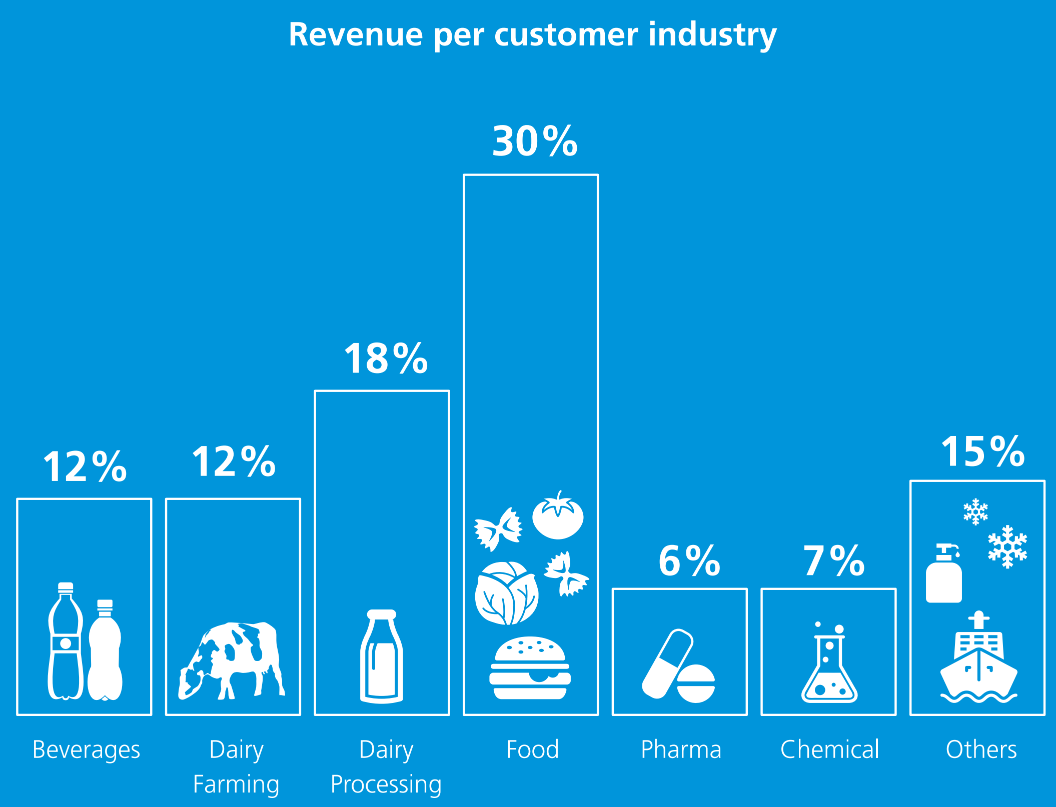
4,880
EUR million revenue

479
EUR million EBITDA before restructuring measures

9.8
EBITDA before restructuring measures in % of revenue

0.85
EUR per share dividend proposal

Solutions for the food, beverage & pharmaceutical industry account for ~78% of revenue



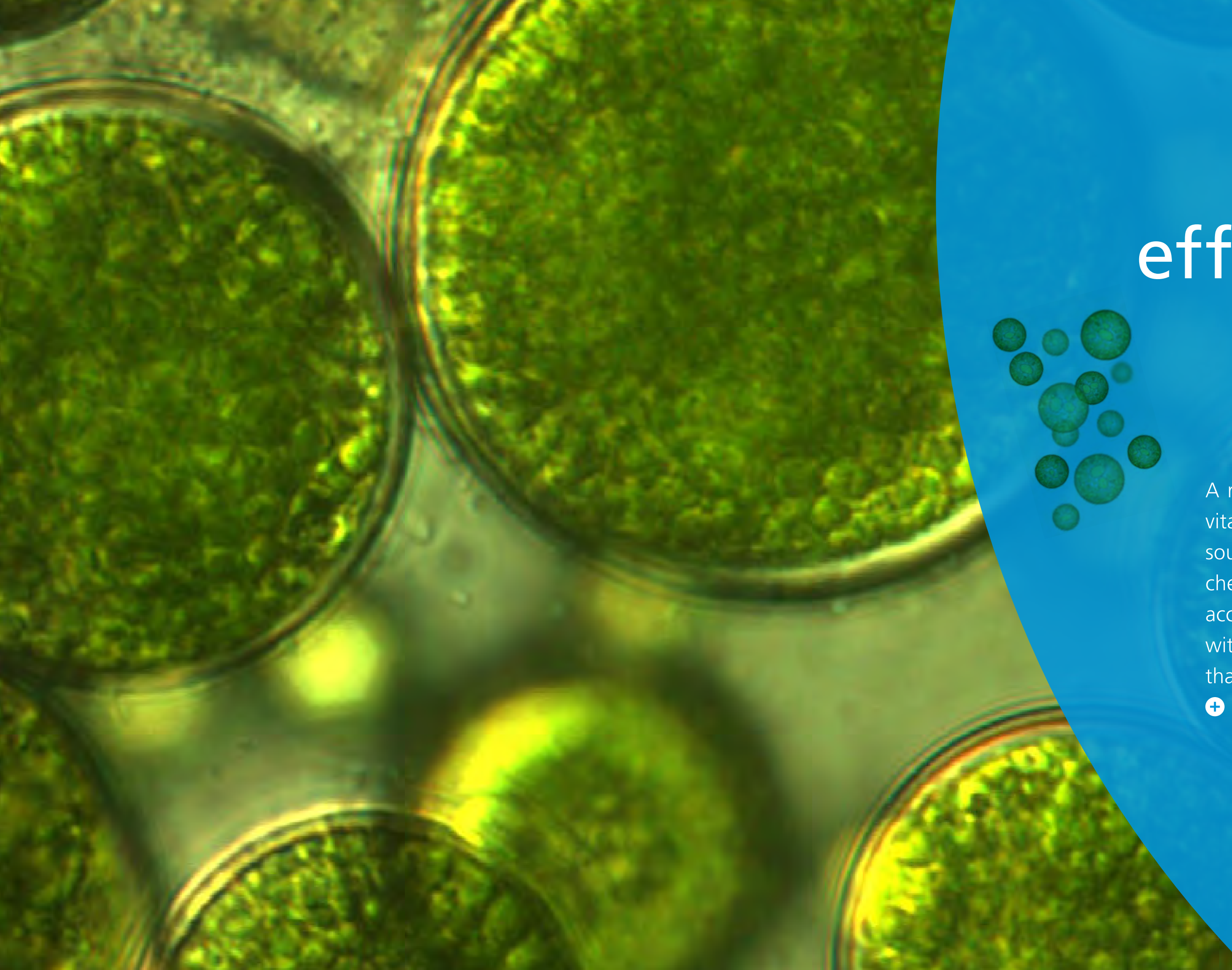
Less plastic, same performance

A simple package design that uses less plastic while increasing recyclability

Food packaging has become very complex and consumers often find it difficult to separate, and therefore recycle. Working with packaging experts, GEA helped design FoodTray, which is constructed from corrugated cardboard made from renewable resources and a thin sheet of plastic flex film for product visibility and maximum fresh food safety. Once emptied, it is easy to separate and recycle both materials.

FoodTray is available in various sizes and print-friendly options and is designed for use with the updated GEA PowerPak PLUS thermoformer.

Link to article



Scaled up, efficient production

Unlocking algae's potential in the age of alternatives

A rich source of polyunsaturated fatty acids, proteins, enzymes, vitamins, minerals and trace elements, algae has become a highly sought after raw material for numerous products in the pharma, chemical and food sectors. For more than 50 years, GEA has accompanied start-ups and algae producers in Asia and Europe with R&D support and high-quality and processing technologies that meet strict industry standards.

Link to article

Customer-first, digital solutions

Integrated machine and people intelligence to boost quality and performance

The digital landscape is moving quickly, however for GEA there is a red thread which focuses all our efforts: the customer's viewpoint. The right amount of automation, at the right time; integrated business processes, networked production data and intelligent data analysis tools designed to increase safety, performance and service life, while minimizing downtime and bottlenecks – these are the must-haves for our customers.

Whether it's on the farm or in the factory, GEA is developing equipment, processes and plants that flexibly adapt to changing market conditions, with solutions that also provide the benefits of IoT capabilities.

Link to article

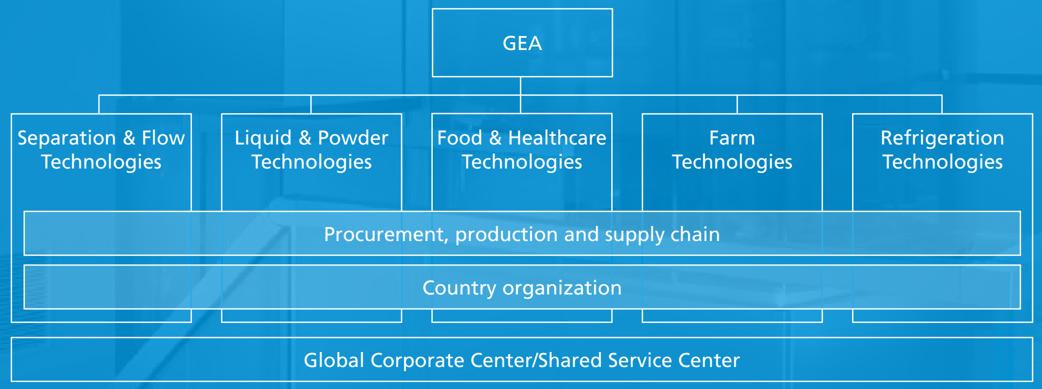
New group structure

From January 2020, the new structure is organized by similar or complementary core technologies within GEA and is divided into five divisions, each with a maximum of six business units

All units are operated by managers with direct P&L responsibility. The new divisional structure promotes entrepreneurial behavior – one of the central GEA values – and transparency both internally and externally. It is key to a sustainable increase in profitability. In addition, the proven bundling of activities in country organizations will be retained so that we can continue to offer customers centralized, yet local contacts.

Link to more information

From heterogeneous business areas to technologically-oriented divisions



Six core organizational principles that make the difference

Organization of the divisions according to core technologies for high-growth and less volatile markets

Management receives clear P&L responsibility, local entrepreneurship is strengthened

Combination of the divisional structure with an effective country organization

Use of considerable synergies in procurement and production landscape

Strengthened and improved control of the service business through its own management function – with P&L responsibility – in each division

Transparency in financial management through divisional structure with focused business units

Separation & Flow Technologies Division

World-class performance from our process champions

Separators // Homogenizers // Valves & Pumps

Separation & Flow Technologies encompasses GEA process engineering components and machines that are at the heart of so many production processes: separators, decanters, homogenizers, valves and pumps.

Our solutions contribute to a cleaner environment in many industrial applications and ensure the efficient separation and homogenization of liquids for use in diverse high-quality products that consumers enjoy and also rely on. GEA pumps and valves guarantee that raw materials and products move efficiently and safely through plants.

~1,240 € million revenue

~247 € million EBITDA before restructuring measures

~20 % EBITDA before restructuring measures

~4,450 Employees (FTE)

Pro forma figures 2019 for group structure applicable from January 1, 2020

Homogenizers

With our high-pressure homogenizers manufacturers can micronize and standardize individual particles, ensuring product stabilization and long shelf life. These properties are key to many of today's health and personal care products and also contribute to the quality of many processed foods and beverages.

Separators

GEA separators and decanters are used in thousands of applications by nearly every industry, including: dairy processing, food & beverage, marine, oil & gas, power, chemical, pharma, farming and in water and wastewater management.

Valves & Pumps

To ensure smooth production processes in the treatment of liquid products, GEA offers a comprehensive range of valves for all hygienic classes, as well as hygienic pumps and cleaning technology. Their individual modular design guarantees efficiency, safety and reliability.

Liquid & Powder Technologies Division

Specialists in processing equipment and integrated solutions

Liquid Technologies // Powder Technologies // Beverage & Filling Technologies // Chemical Technologies

Liquid & Powder Technologies provides process solutions for the dairy, beverage, food, chemical and other industries. Our portfolio includes liquid processing & filling, concentration, crystallization, purification, drying, powder handling & packaging as well as systems for emission control.

We design, build, configure and install versatile and efficient equipment and technologies, processing lines and complete plants.

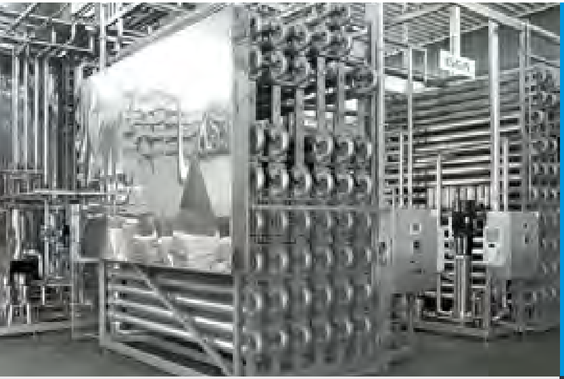
~1,730 € million revenue

~87 € million EBITDA before restructuring measures

~5 % EBITDA before restructuring measures

~5,510 Employees (FTE)

Pro forma figures 2019 for group structure applicable from January 1, 2020



Powder Technologies

Chemical Technologies

Liquid Technologies

Specializing in solutions for hygienic liquid processing, GEA competence covers mixing, membrane filtration, heat treatment, aseptic processing and cheese making equipment. Market milk products, ice cream, cheese, soups and condiments are focus areas, as are home and personal care applications.

Our solutions for evaporation, drying and powder handling & packaging technologies are used for a wide range of dairy, food and chemical applications such as nutritional formula, food ingredients, instant coffee, polymers and fine chemicals.

Beverage & Filling Technologies

Suppliers of complete end-to-end solutions, our portfolio includes materials handling, extraction, brewing, mixing, blending, heat treatment and filling and packaging for the full range of beverages including ESL and aseptic products.

We specialize in process solutions and plants including evaporation, distillation and crystallization technologies, as well as vacuum, ejector and emission control systems. Primary applications include bulk & specialty chemicals, minerals, agrochemicals, food & beverages and emission control.

Food & Healthcare Technologies Division

Safe foods and medicines for a growing population

Pasta, Extrusion & Milling // Bakery // Slicing & Packaging // Food Solutions // Frozen Food // Pharma & Healthcare

The vast product range of Food & Healthcare Technologies includes solutions for food processing, covering preparation, marinating and further processing of meat, poultry, seafood and vegan products, pasta production, baking, slicing, packaging, confectionery as well as frozen food processing. We also offer equipment for cereals handling and milling and for producing cereal-based snacks, breakfast cereals as well as dry and wet pet food.

Our solutions for the pharmaceutical, biopharmaceutical & nutraceutical sectors include components, equipment and entire plants for processing solid, liquid, semi-solid, viscous, hazardous and hygroscopic products, either for batch or continuous production.

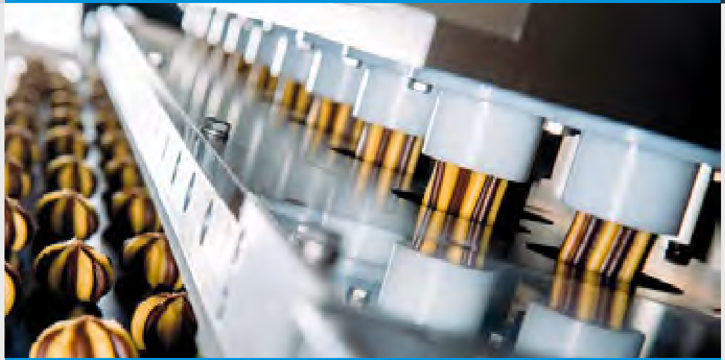
~960	~67	~7	~3,450
€ million revenue	€ million EBITDA before restructuring measures	% EBITDA before restructuring measures	Employees (FTE)

Pro forma figures 2019 for group structure applicable from January 1, 2020

Bakery

Pasta, Extrusion & Milling

Our solutions for pasta and extruded food include cereals handling and milling plants processing and packaging lines for fresh and dry pasta, including gluten-free products, as well as for cereal-based snacks and breakfast cereals and dry pet food.



GEA bakery capabilities range from single equipment components to integrated production lines for cakes, pies, biscuits, cookies, crackers, layer cakes and snacks. Energy-efficient tunnel ovens, depositors, dough forming systems and filling injectors make up this hard-working portfolio.

Slicing & Packaging

Our slicing & packaging portfolio includes slicing and loading systems, vertical packaging equipment and thermoforming systems. Our machines are designed to meet the highest uptime requirements and bring automation and ease-of-use benefits, while meeting all hygienic standards to ensure product safety. We continue to innovate by offering more sustainable packaging as well as solutions for improved MAP testing to ensure food quality and reduce waste.

Food Solutions

Our portfolio encompasses preparation and further processing equipment, including single machines and complete automated lines. We offer solutions for defrosting, cutting & grinding, mixing, forming, marinating, coating, cooking, steaming, in-line smoking and frying. Our technology can be used for processing poultry, meat, seafood, vegetarian, as well as plant-based or alternative protein foods.

Frozen Food

GEA freezers provide consumers with high-quality products with an extended shelf life. Our portfolio consists of spiral- tunnel- and carton freezers. Combined with our award-winning freezer control sensor technology, manufacturers can ensure accurate and consistent product quality while reducing their energy costs.

Pharma & Healthcare

A global specialist in solid and liquid dose technology, our robust, flexible and cost-effective pharmaceutical manufacturing equipment and fully integrated process lines maximize operational reliability and productivity. Our portfolio includes tablet compression and coating, granulation and drying, batch and continuous processing, contained materials handling, freeze-drying and fermentation.

Farm Technologies Division

Deep roots to support customers in an evolving landscape

Milking & Dairy Farming: Milking & Feeding, Cooling, Manure, Barn

Farm Technologies offers integrated customer solutions for efficient and high quality milk production and livestock farming, including automatic milking and feeding systems, conventional milking solutions, milk cooling and storage, well-designed barn equipment and digital herd management tools. Our manure management solutions ensure operators have the right tools for safe and efficient storage, application and for creating side streams from this important resource.

Our portfolio also includes a wide range of equipment and accessories to promote optimum cow health and comfort from teat sprays, brushes and mattresses.

~660
€ million revenue

~60
€ million EBITDA
before restructuring measures

~9
% EBITDA
before restructuring measures

~2,160
Employees (FTE)

Pro forma figures 2019 for group structure applicable from January 1, 2020

Milking & Dairy Farming

Our industry-leading solutions include equipment and accessories for dairy herds of all sizes, backed up by farm credentials that span nearly 100 years.

Milking & Feeding

GEA offers all ranges of automated milking solutions, from single box to fully automated rotary parlor systems to conventional rotary and group parlors. Our automated feeding solutions ensure cows get the right mix at the right time, improving efficiency and freshness.

Cooling

GEA offers diverse cooling solutions suitable for all herd sizes and for the individual demands of every farm, from horizontal and vertical milk cooling tanks to milk cooling vats.

Manure

GEA is a global leader in manure management, providing a comprehensive line of equipment to effectively handle manure inside and outside the barn. Our portfolio includes: barn cleaning, electric and power take-off pumps and agitators, loading equipment, liquid manure spreaders, manure application devices and separators.

Barn

For optimum health and comfort we offer ventilation, fencing systems, handling and sorting equipment, cow brushes, mattresses and comfortable housing and young stock feeding equipment.

Refrigeration Technologies Division

Future-proof solutions for industrial cooling & heating

Components // Projects // Skids

GEA Refrigeration Technologies is a global specialist in industrial refrigeration, heating and sustainable energy solutions for a wide array of industries including food, beverage, dairy and oil & gas. Our proven technologies provide our customers with what they value most – reliability, operating efficiency, sustainability and long equipment life cycles that reduce their total cost of ownership.

Our turnkey cooling and heating installations, custom-engineered systems, compressors & compressor packages, chillers, controls and heat pumps are designed to meet precise temperature requirements. Our comprehensive service programs support our customers throughout the full life cycle of their plant and equipment to ensure peak performance.

~700 € million revenue

~58 € million EBITDA before restructuring measures

~8 % EBITDA before restructuring measures

~2,640 Employees (FTE)

Pro forma figures 2019 for group structure applicable from January 1, 2020

Components

GEA offers a diverse component portfolio for commercial and industrial refrigeration with a full range of reciprocating and screw compressors, chillers, heat pumps, condensing units, dryers and purgers.

Projects

GEA's decades of experience extends to complete plant cooling installations. As sustainability is a key focus of those we serve and for GEA, we help our customers identify optimum refrigeration and heating solutions to achieve their present and future sustainability-related goals. This is done by designing and implementing customized solutions based on holistic plant energy analyses for both existing processes and those that are in the pipeline. As a result, customers significantly reduce their energy costs and carbon footprint.

Skids

GEA offers standard as well as customized systems, built on skids, for ease of transport and installation. Featuring a vast range of compressor, chiller and heat pump systems, they are designed to meet customers' precise temperature and capacity requirements.

GEA Executive Board

Link to more information

MARCUS A. KETTER

CFO

In addition to controlling, accounting, treasury, tax, risk management and investor relations, Marcus A. Ketter is responsible for global IT and business process management and outsourcing. He has been a member of the Executive Board since May 2019.

STEFAN KLEBERT

CEO

Stefan Klebert took the helm of the Group in February 2019 and is the direct reporting line for the CEOs of the five operating divisions and the four CEOs of the regions. Various central functions also report to Stefan Klebert, and he also serves as the group's Labor Relations Director.

JOHANNES GILOTH

CHIEF OPERATING OFFICER

Since the start of 2020, Johannes Giloth has been the board member responsible for a new executive mandate that encompasses worldwide procurement, production and supply chain, as well as corporate responsibility & QHSE.

Interview Stefan Klebert

Interview Stefan Klebert

Dear Shareholders,

STEFAN KLEBERT
CEO OF GEA GROUP AKTIENGESELLSCHAFT

GEA looks back on an eventful 12 months. Fiscal year 2019 set the course for profound changes in the company's organizational setup. GEA has returned to a divisional structure while relying on decentralized, entrepreneurial corporate entities. This also included an overhaul of the Executive Board. At the same time, our mechanical engineering enterprise had to stand its ground in a difficult economic environment. Thus, I have all the more respect for our employees who have offered proof of their loyalty and commitment throughout this period of corporate transformation and renewal. Due to an outstanding team effort, we have succeeded in meeting or even exceeding all expectations as far as revenue, earnings and return on capital employed are concerned. The same applies to order intake, which was slightly higher than in the previous year. This is also an encouraging starting point for future value growth. This development goes to show that the measures we launched and rigorously implemented in 2019 are coming to fruition. In turn, this has helped us restore a lot of trust in the capital market, which resulted in a more than 30 percent increase in the share price of your company during the year under review.

The most significant internal reform we tackled during the previous year was our new divisional organizational structure. Since the beginning of 2020, our managers have resumed direct responsibility for sales as well as profit and loss. This way, we are seeking to inspire entrepreneurial thinking and behavior while promoting competitive agility. Our new corporate structure also embraces the expansion of the service business, which is profitable and also allows us to establish even closer ties with our customers. Our procurement team has been given more authority and by joining forces the ability to unleash potential which was another priority associated with GEA's reorganization. This will help us achieve savings of more than EUR 25 million during the current fiscal year. By establishing an Executive Board remit that combines procurement, production and supply chain, we have paved the way for advancing this specific cause. Furthermore, we have also swiftly moved ahead with various restructuring measures and managed to implement them earlier than anticipated. In this context, expenses in the amount of approximately EUR 50 million, which were originally budgeted for 2020, have been accelerated and shown results in the fiscal year just ended.

It is true, that over the previous year, we have scrutinized and challenged many things at GEA. Nonetheless, both the Executive Board and the Supervisory Board remain steadfast in their opinion that our dividend policy shall remain unchanged. Operationally speaking, GEA is a sound company. For this reason, we intend to propose an unchanged dividend payout of EUR 0.85 per share at the Annual General Meeting.

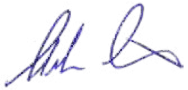
We also plan to achieve much over the coming months. Our medium-term objectives illustrate that we will be seeking to execute further savings potential and to become even more profitable overall; on the other hand, we will divest low-margin and low-synergy activities. At the same time, we are going to invest in state-of-the-art IT systems and put our resource planning on a new footing by setting up a global ERP infrastructure. GEA has got what it takes to create real value.

And then, there is another point that really matters to us: As an international mechanical engineering company, GEA is making a commitment regarding urgent and pressing issues impacting our future, issues that are on everybody's mind all around the globe. In many fields, we are technology leaders. Offering our leading knowhow and value-creating innovations, we can make a difference and step up to the plate by contributing solutions that help meet collective challenges like climate change and the safeguarding of worldwide food supplies.

Our efforts are not merely aimed at building highly efficient and resource-conserving systems and plants for our customers. We are also undertaking efforts to make our own production even more sustainable – with measurable results: Once again, 2019 saw an improvement in our EcoVadis supplier rating. Moreover, GEA was awarded the "Leadership" grade A- for its action on climate change under the Carbon Disclosure Project (CDP), our best result ever, which ranks us among the group of top performing companies. As one of the largest international suppliers of process technology, we attach great importance to playing an active role in shaping responsible management. This is why we are going to get more involved in the discussion of global issues, an endeavor we began in 2019 within the framework of the World Economic Forum.

Fostering dialogue with all those favorably disposed towards our company – this is what we want. We will keep you posted and maintain a dialogue regarding GEA's strategic and cultural transformation which we jointly initiated with our employees in 2019. Thank you very much for placing your trust and confidence in the fresh start we have made.

Yours sincerely,



Stefan Klebert
CEO

Dr. Helmut Perlet
Supervisory Board
Chairman of GEA Group
Aktiengesellschaft

Report of the Supervisory Board

During fiscal year 2019, the Supervisory Board performed the monitoring and advisory functions incumbent upon it by virtue of the law, the Articles of Association and the Rules of Procedure. In doing so, it regularly dealt with the progress and the prospects of the company as well as all specific material issues while continuously advising the Executive Board on matters relating to the management of the company.

For fulfilling its tasks, the Supervisory Board, on the one hand, relied on the discussions held during its meetings and the meetings of its committees. On the other hand, the Executive Board – in compliance with its obligation to inform – kept the Supervisory Board and its committees up to date through regular, timely and comprehensive written and/or oral reports on all relevant matters and measures relating to the company, its course of business, corporate planning, strategy as well as the progress of the group. The Supervisory Board was involved in all decisions of fundamental importance to the company and assisted the Executive Board in an advisory capacity. At committee level and during the meetings of the full Supervisory Board, the members of the Supervisory Board were given sufficient opportunity to critically analyze and appraise the reports and motions for resolution submitted by the Executive Board – and to put forward recommendations. The results obtained and the essential contributions made during the discussions held at committee meetings were presented by the chairs of the individual committees at the respective following Supervisory Board meetings and, thus, assisted the full Board in forming an opinion. This way, the preparatory and in-depth work undertaken by the committees was instrumental in enhancing the overall efficiency of the activities of the Supervisory Board.

Furthermore, the Chairmen of the Supervisory Board and the Audit Committee as well as the Chairwoman of the Technology Committee maintained regular contact with the Executive Board. Between the meetings, the Chairman of the Supervisory Board and the CEO regularly discussed matters of strategy, planning, business progress, risk exposure, risk management and compliance. Outside of meetings, the Chairman of the Audit Committee remained in contact with members of the Executive Board, in particular the CFO, to keep abreast of current developments relevant to the work of the Audit Committee and to discuss them, if necessary. In preliminary meetings with the Executive Board, the employee representatives regularly deliberated on the most important agenda items prior to the meetings of the full Supervisory Board.

On a regular basis, the Supervisory Board received specific information on the order intake, revenue, earnings as well as the employment situation of the group and its business areas. Explanations on deviations of business performance from set plans and targets were given on the basis of supporting documents. Prior to and between the meetings, the Executive Board delivered written reports on significant events to the members of the Supervisory Board. Following deliberations at committee level, the future prospects and the strategic orientation of the company and its business areas, as well as corporate planning were extensively discussed and agreed with the Supervisory Board.

After comprehensive scrutiny and deliberations as well as discussions at committee level, as the case may be, the members of the Supervisory Board cast their votes on the reports and motions for resolution submitted by the Executive Board insofar as this was appropriate or required by law, the provisions of the Articles of Association or the Rules of Procedure. For reasons duly substantiated, in particular in matters of special urgency, resolutions were adopted by written procedure.

In the year under review, there were no conflicts of interest involving members of the Executive Board and the Supervisory Board that would have required immediate disclosure to the Supervisory Board and communication to the Annual General Meeting.

Focus areas of Supervisory Board deliberations

In fiscal year 2019, the Supervisory Board held seven meetings. On these occasions, the Supervisory Board regularly discussed matters relating to the company's business progress, its financial position as well as share price performance. Apart from that, the following key topics were addressed.

The key items on the agenda of the Supervisory Board meeting held on February 11, 2019, included the preliminary financials 2018, the 2019 budget, achievement of targets for the 2018 remuneration of the Executive Board, the appointment of the Labor Relations Director as well as the future committee structure of the Supervisory Board.

Key issues addressed during the Supervisory Board meeting held on March 13, 2019, included the adoption of the annual financial statements including the appropriation of net earnings and the approval of the consolidated financial statements for fiscal year 2018. Apart from that, the Supervisory Board dealt with the final determination and weighting of the Executive Board members' individual targets for the 2019 fiscal year, the core messages to be conveyed during the presentation of the company's annual results at a press conference on March 14, 2019, as well as the motions for resolution on the individual agenda items to be submitted to the Annual General Meeting scheduled for April 26, 2019. In addition, the company's Chief Compliance Officer delivered a detailed report on the 2018 fiscal year just ended. Furthermore, the Supervisory Board and Niels Erik Olsen mutually agreed to terminate his Executive Board mandate, reaching an understanding about Niels Erik Olsen's departure on March 13, 2019.

At the Supervisory Board meeting held on April 26, 2019, the Board focused on Dr. Helmut Schmale's premature departure by mutual consent as well as the preparation of the Annual General Meeting held that day.

During its meeting on June 18, 2019, the Supervisory Board was given an account of the progress of Executive Board succession planning and also informed about a lawsuit in the U.S.. Moreover, the Supervisory Board passed resolutions on a pension benefits adjustment for the former members of the Executive Board, on the definition of the 2019 individual targets for Marcus A. Ketter as well as an amendment of the Rules of Procedure of the Audit Committee. Apart from that, the Supervisory Board dealt with various matters relating to public takeovers as part of a thematic focus of its work in the past financial year, which is why it established a Special Committee at this meeting which dealt with these issues in greater depth. Corporate governance, the overhaul of the German Corporate Governance Code as well as public takeovers also represented the priority areas addressed during a full-day Supervisory Board skills training workshop that took place on August 2, 2019.

On the occasion of a strategy meeting held on June 19, 2019, the Supervisory Board exclusively focused on the new organization. In this context, the Supervisory Board was informed about the new management structure as well as the future roles and responsibilities within the new organization. The presentation also included the timeline for implementing the future organization and an introduction to the CREATE transformation project.

On September 24, 2019, the Supervisory Board received a progress report on the CREATE transformation program. Furthermore, the Executive Board provided extensive information on the subject matters to be presented at the Capital Markets Day in London scheduled for September 26, 2019. Apart from that, the Supervisory Board appointed Johannes Giloth as new member of the Executive Board and/or Chief Operating Officer, whereupon it engaged in deliberation on Ms. Snels's premature and amicable departure from the Executive Board.

At its meeting on December 19, 2019, the Executive Board presented its 2020-2022 medium-term planning as well as the 2020 budget, which was approved by the Supervisory Board. In addition, the Supervisory Board was once again given an update on the progress of the CREATE transformation project with particular focus given to the new organizational structure, which was explained in detail. Moreover, the meeting also saw the presentation and discussion of a comprehensive portfolio analysis. Furthermore, the Supervisory Board addressed Executive Board target achievement in 2019 and discussed proposals for Executive Board targets for fiscal year 2020.

Work of the committees

In the year under review, the Presiding Committee met on six occasions, focusing primarily on succession planning processes in relation to the position of CFO and the head of the new procurement, production and supply chain function that was to be created, as well as the renumeration of the Executive Board. Apart from that, the Presiding Committee specifically addressed the topic of corporate governance and transactions requiring approval. Furthermore, the Presiding Committee's remit includes matters of corporate strategy, capital investment as well as funding that are addressed together with the Executive Board.

The Audit Committee held five meetings. In the presence of the auditor, the CEO as well as the CFO, it focused on the annual financial statements in conjunction with the consolidated financial statements for 2018 as well as the 2019 quarterly financial statements and half-yearly financial reports. Furthermore, the Committee's key activities included monitoring the accounting process, the effectiveness of the internal control, risk management and audit systems, the audit of the annual financial accounts as well as compliance. At regular intervals, the Audit Committee was briefed on the risks and opportunities faced by the company. The auditors extensively elaborated on their audit activities and the audit process. In addition, the Audit Committee submitted its proposal for the appointment of an auditor to the Supervisory Board, dealt with the engagement of the auditor of the annual financial accounts, determined the audit process and the key audit areas including audit fees, ensured the required independence of the auditor and addressed the permitted non-audit services provided by the latter.

In the year under review, the Nomination Committee was convened on three occasions and dealt with matters of Supervisory Board succession planning.

With effect from May 1, 2019, the Supervisory Board formed a Technology Committee comprising Dr. Molly Zhang as Chair, Michaela Hubert, Brigitte Krönchen as well as Jean E. Spence. In fiscal year 2019, the members of the Technology Committee gathered for two meetings.

In addition, the Supervisory Board set up a Special Committee comprising Dr. Helmut Perlet, Hartmut Eberlein, Rainer Gröbel and Kurt-Jürgen Löw at its meeting on June 18, 2019. Prior to its dissolution in December 2019, the Committee met on six occasions and focused its attention on various subject matters related to takeover law.

The year under review did not see a meeting of the Mediation Committee.

The committee chairs briefed the Supervisory Board on the activities undertaken by their committees during the Supervisory Board meetings held in the wake of the respective committee meetings.

Disclosure of individual meeting attendance

Supervisory Board member	Supervisory Board and committee meetings	Attendance	Attendance rate
Dr. Helmut Perlet (Chairman)	27	27	100 %
Kurt-Jürgen Löw (Deputy Chairman)	18	18	100 %
Ahmad Bastaki	16	15	94 %
Hartmut Eberlein	18	18	100 %
Rainer Gröbel	16	16	100 %
Colin Hall	13	12	92 %
Michaela Hubert	15	15	100 %
Eva-Maria Kerkemeier	7	6	86 %
Michael Kämpfert	12	12	100 %
Brigitte Krönchen	14	14	100 %
Jean Spence	12	11	92 %
Dr. Molly Zhang	9	9	100 %

Whenever Supervisory Board members were unable to attend meetings of the Supervisory Board or its committees, they had asked to be excused and usually cast their votes in writing.

Corporate governance

The Supervisory Board is continuously monitoring the evolution of the standards set out by the Corporate Governance Code. During a Supervisory Board skills training workshop in early August 2019 and at its meeting on December 19, 2019, the Supervisory Board deliberated on the overhaul of the German Corporate Governance Code that had already been presented in May 2019. On December 19, 2019, the Executive Board and the Supervisory Board also issued an updated Declaration of Conformity in accordance with s. 161 AktG (Aktiengesetz – German Stock Corporation Act) and made it permanently accessible to the general public on the company's website. Further information on corporate governance can be found in the Corporate Governance Report (see page 76 ff.)

Annual financial statements and consolidated financial statements 2019

The 2019 annual financial statements of GEA Group Aktiengesellschaft, the consolidated financial statements prepared in accordance with IFRS and the combined management report were audited by KPMG AG Wirtschaftsprüfungsgesellschaft and received an unqualified audit opinion. Since fiscal year 2011, KPMG AG Wirtschaftsprüfungsgesellschaft, Berlin, has audited the financial statements of GEA Group Aktiengesellschaft and the group. The head auditor responsible for conducting the audit since 2018 has been Michael Jessen.

In the presence of the auditors, the combined management report, the annual financial statements of GEA Group Aktiengesellschaft, the proposal for the appropriation of net earnings as well as the consolidated financial statements and the audit reports for fiscal year 2019 were extensively discussed during the meeting of the Audit Committee on March 5, 2020, and at the Supervisory Board meeting for balance sheet approval held on March 12, 2020. The auditors reported on the audit process and the key findings of their audit. They were also available to answer questions.

On the basis of the final result of the examination performed by the Audit Committee and after conducting its own scrutiny, the Supervisory Board agreed with the auditors' findings at its meeting held on March 12, 2020, and found that there were no objections to be raised. The Supervisory Board approved the 2019 consolidated financial statements, the 2019 annual financial statements of GEA Group Aktiengesellschaft, as well as the combined management report. The annual financial statements of GEA Group Aktiengesellschaft are hereby adopted. The Supervisory Board considers the proposal for the appropriation of net earnings to be reasonable.

The review of the company's consolidated non-financial statement for fiscal year 2019 by the Supervisory Board pursuant to s. 171 para. 1 AktG was supported by a limited assurance engagement conducted by KPMG. For this purpose, KPMG audited GEA's risk assessment as regards relevant information about the company's sustainability performance, evaluating the design and implementation of systems and processes designed to ascertain, process and monitor disclosures on environmental, employee-related and social matters, human rights, corruption and fraud, including data consolidation. Referring to the auditor's findings, the Audit Committee also conducted its own audit steps and satisfied itself that the data submitted complied with the legal requirements; the Chairman of the Audit Committee informed the Supervisory Board accordingly.

Changes in the composition of the Supervisory Board and the Executive Board

Jürg Oleas, CEO, left the company on February 17, 2019. Stefan Klebert took over as CEO from Jürg Oleas on February 18, 2019.

On March 13, 2019, Niels Erik Olsen retired from the Executive Board.

Dr. Helmut Schmale, CFO, left the Executive Board on May 17, 2019. Marcus A. Ketter assumed the position of CFO on May 20, 2019. He was appointed for a term of three years.

Martine Snels, member of the Executive Board, departed on December 31, 2019.

Johannes Giloth joined the Executive Board as Chief Operating Officer on January 20, 2020. He is responsible for the newly established procurement, production and supply chain function. Johannes Giloth was appointed for a three-year term.

Steffen Bersch stepped down from the Executive Board on February 29, 2020.

The Supervisory Board wishes to express its gratitude and appreciation to the senior management teams, employee representative bodies and, in particular, to all employees of GEA Group, thanking them for their personal commitment and all their work during the previous fiscal year.

Düsseldorf, March 12, 2020

Dr. Helmut Perlet
Chairman of the Supervisory Board

GEA Shares/Investor Relations

Performance of GEA shares in the capital markets

Despite a market environment that continues to be compromised by trade barriers, GEA's share-price performance was very positive in 2019. The fact that the share performed better in the second half of the year than in the first was a reflection of a return of confidence in GEA's management. With a gain of 31 percent, the performance of the GEA Group Aktiengesellschaft share reflected the trend in Germany's MDAX (+31.2 percent), while almost matching the performance of the STOXX® Europe TMI Industrial Engineering benchmark (+35.7 percent). On February 8, 2019, GEA shares reached EUR 19.47 – the lowest point of the year. The share price peaked at EUR 30.15 on December 23. At the end of the year, the share was quoted at EUR 29.48.

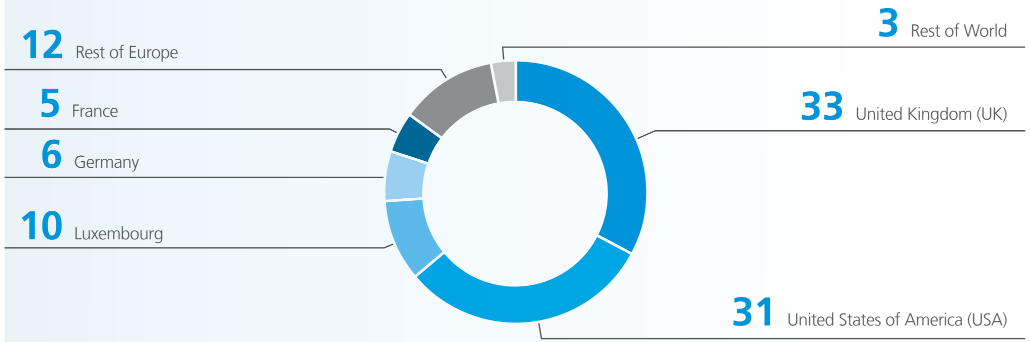
Shareholder structure

The number of shares outstanding at the end of 2019 was 180,492,172, on a par with the previous year. Market capitalization at the end of 2019 amounted to around EUR 5.3 billion (previous year: EUR 4.1 billion).

In 2019, as in previous years, GEA performed regular analyses of its shareholder structure; the most recent identified 96.4 percent of all shares outstanding. It was established that institutional investors held more than 80 percent of all shares, with investors from the UK and the U.S. accounting for a good two-thirds.

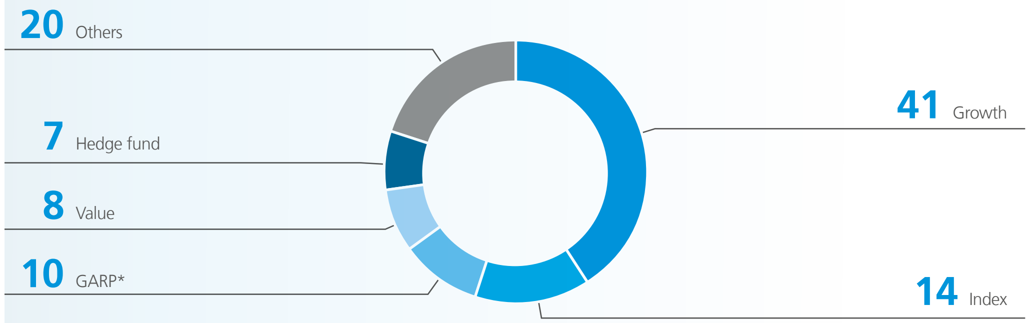
GEA still has two investors – Kuwait Investment Office and Oliver Capital (the principal shareholder of Groupe Bruxelles Lambert) – that do not count as free float according to the definition applied by the German stock exchange (Deutsche Börse). According to the most recent voting rights announcements submitted to the Company, Kuwait Investment Office held 16,092,940 voting rights (through shares and instruments) as of April 19, 2016, which corresponded to some 8.9 percent of equity as of December 31, 2019. On December 7, 2018, Oliver Capital held a total of 15,357,460 voting rights (exclusively shares), which corresponded to some 8.5 percent of equity as of December 31, 2019. According to Deutsche Börse, therefore, approximately 83 percent of GEA shares were in free float as of the reporting date.

Regional breakdown of shareholders
(in %)



Based on 96.4% of identified shares

Investment styles of institutional investors
(in %)



*) Growth at a reasonable price
Based on 96.4% of identified shares

Investor relations activities

GEA engages in regular dialog with capital market players in addition to quarterly financial reporting. GEA kept in close contact with investors in 2019 by participating in three investor conferences and hosting 16 roadshows – some of which were attended by the company's CEO and CFO. GEA held more than 200 one-on-one meetings at these events. A capital markets day in London in September 2019 saw the Executive Board inform attendees about strategic initiatives and present the latest medium-term forecasts up to the year 2022.

Credit ratings/debt market

Rating agencies assess the ability of a company to honor its financial obligations. Through regular meetings with a company's management and financial department, and by conducting their own extensive analyses, the agencies are able to arrive at an individual score or rating for the organization. These ratings serve as evidence of the company's creditworthiness to existing and potential debt capital providers.

For many years now, the international agencies Moody's and Fitch have been rating the financial standing of GEA Group Aktiengesellschaft. In the 2019 fiscal year, Fitch upheld its assessment of GEA Group Aktiengesellschaft's creditworthiness. Moody's, however, reduced its outlook to „negative," while maintaining the investment grade rating (Baa2).

	2019		2018	
Agency	Rating	Outlook	Rating	Outlook
Moody's	Baa2	negative	Baa2	stable
Fitch	BBB	negative	BBB	negative

The ratings enable GEA to raise funding by utilizing various debt instruments available on the international financial markets. This highlights how important it is for GEA to maintain its investment grade rating and continue to optimize its financial results going forward.

In total, GEA has credit lines in the amount of EUR 1,133.7 million, of which EUR 324.3 million had been utilized as of the balance sheet date. Further information on the credit lines and their utilization can be found in note 3 to the consolidated financial statements beginning on page 201 ff.

Combined Group Management Report

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Fundamental Information about the Group

Group business model

Combined management report of GEA Group Aktiengesellschaft and the GEA group

GEA Group Aktiengesellschaft is home to central management functions of the group. Profit and loss transfer agreements exist with key domestic subsidiaries. In addition, GEA Group Aktiengesellschaft performs central financial and liquidity management. Furthermore, it provides its subsidiaries with services from the Global Corporate Center on the basis of service agreements.

Since the course of business, the economic position, and the opportunities and risks associated with the future development of GEA Group Aktiengesellschaft do not differ from the course of business, the economic position, and the opportunities and risks associated with the future development of the group, the management report of GEA Group Aktiengesellschaft has been combined with that of the group in accordance with section 315 (5) of the Handelsgesetzbuch (HGB – German Commercial Code). In contrast to the consolidated IFRS financial statements, the annual financial statements of GEA Group Aktiengesellschaft are based on the HGB, supplemented by the Aktiengesetz (AktG – German Stock Corporation Act). All the financial statements relate to the 2019 financial year (January 1 to December 31, 2019).

GEA reports also on non-financial performance factors in the 2019 Annual Report. The sustainability report follows the international standards of the Global Reporting Initiative (GRI). The GRI Content Index can be found at the end of the Annual Report (see page 289 ff.). Since 2016, GEA's Annual Reports have included an annual sustainability report. In addition, the management report also contains the Combined Corporate Governance Statement.

Organization and structure

The group

The international technology group specializes in machinery and plant, together with process technology and components. Here, GEA provides solutions for sophisticated production processes in various end-user markets, while also offering a comprehensive service portfolio that aims to help customers enhance the sustainability and efficiency of their production processes. GEA is one of the largest suppliers of systems and components to the food processing industry and a wide range of other processing industries, including pharmaceuticals and chemicals.

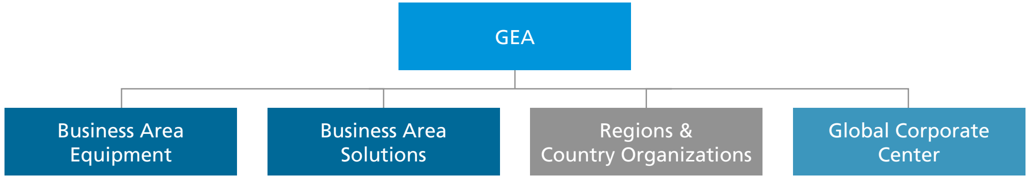
The group is a specialist in its respective core technologies and a leader in many of its sales markets worldwide. GEA consistently promotes an innovation-led culture in an effort to preserve its technological edge (see page 44 ff.).

The group's enduring success is based on a number of major global trends, including:

1. Continuous global population growth
2. Growing middle class
3. Increasing demand for high-quality foods and beverages
4. More demand for efficient production methods that also conserve valuable resources.

Group structure (up to December 31, 2019)

In the 2019 financial year, GEA grouped the development and manufacturing of products and the provision of process solutions and services into two operating segments, namely Business Area Equipment and Business Area Solutions. In the year under review, the Business Area Equipment was headed at Board level by Steffen Bersch, while Niels Erik Olsen was responsible for the Business Area Solutions up to March 13, followed thereafter by Stefan Klebert. Executive Board member Martine Snels was responsible for the company's regional and country organization.



Operating segments

Business Area Equipment

The Business Area Equipment brought together all activities ranging from largely standardized products to customer-specific equipment. The products were primarily manufactured as part of series production on a standardized and modular basis. Typical products from this business area included separators, valves, pumps, homogenizers and refrigeration equipment such as compressors. The equipment portfolio also included process technology for food processing and packaging, for example extrusion and milling equipment. The product range also extended to dairy equipment, feeding systems and slurry engineering, as well as to an entire service portfolio.

Business Area Solutions

The Business Area Solutions encompassed all group activities related to customer-specific products, projects, after-sales and services. These ranged from small projects to complete systems and facilities tailored to specific applications and customer requirements. The offering primarily included the engineering, design and delivery of customized process solutions for the dairy, food, beverage, pharma and chemical industries. This business area also provided solutions for industrial refrigeration and more sustainable energy solutions across all markets served by GEA.

Other companies

The "Other companies" area includes GEA Group Aktiengesellschaft and those companies with business activities that did not form part of the core business. The management report refers to this area only selectively.

Organizational units

Country organizations

In the reporting year, customer-centric sales and local service activities were unified under the umbrella of a single country organization, with the countries grouped under their corresponding and tailored regions. GEA customers had a single national organization per country, this being their central point of contact to the entire product portfolio and comprehensive services offered locally.

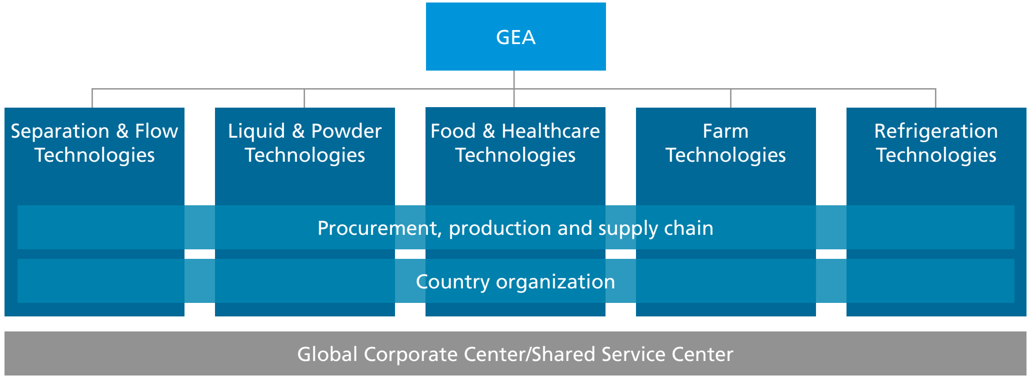
Administrative organization

A Global Corporate Center provided centralized support to all management and administrative functions and performed the management functions for the entire group. This included the groupwide management of strategy, human resources, legal and tax matters, mergers & acquisitions, the central financial organization, internal auditing, marketing & communication and IT. Since November 1, 2018, all functions previously combined under the independent

Shared Service Center (SSC) have also been integrated in the Global Corporate Center. The operating expenses of the Global Corporate Center were allocated to the business areas, where possible.

New group structure (since January 1, 2020)

As reported by GEA in June 2019, since January 1, 2020, the group has been divided into five divisions with up to six business units each; the units comprise similar technologies and each command leading positions in the market. Each division is headed by a management team of three members: a divisional CEO, a divisional CSO (Chief Service Officer), and a divisional CFO. The introduction of a CSO function for each division underscores the significance of a stable and attractive service business for GEA.



Five divisions

Separation & Flow Technologies

Separation & Flow Technologies is home to all activities concerned with the manufacture of process-related components, notably separators, decanters, valves, pumps, and homogenizers.

Liquid & Powder Technologies

Liquid & Powder Technologies is a recognized market and technology leader in the design and development of process solutions for the dairy, brewing, food, and chemical industries. Its technological focus is on liquid processing, concentration, industrial drying, powder processing and handling and emission control.

Food & Healthcare Technologies

The Food & Healthcare Technologies division provides a range of competencies to the pharmaceutical and food industries. These include customer solutions for food processing and packaging, solutions for the baking industry, extrusion and milling equipment, and process technology for the pharmaceutical industry.

Farm Technologies

Farm Technologies bundles together all the activities involved in the development of integrated customer solutions for profitable dairy and livestock farming. GEA has a range of comprehensive solution packages for dairy farms, ranging from automatic milking and feeding systems, manure management systems and barn equipment as well as digital herd management solutions.

Refrigeration Technologies

Refrigeration Technologies is a market leader in the field of industrial refrigeration technology. The division develops, manufactures, and installs innovative key components and technical solutions such as reciprocating and screw compressors, and valves.

Country organizations

Customer-centric sales and local service activities will remain unified under the umbrella of a single country organization. The countries will cooperate with the divisions in a matrix and are assigned to tailored regions. GEA customers have a single national organization per country, which is their central point of contact to a comprehensive portfolio with all services offered on a local basis.

Control and management

Central management and administrative functions, together with standardized administrative processes will also continue to be bundled within the Global Corporate Center (GCC). The Global Corporate Center performs the essential management functions for the entire group. Overarching group functions will focus on the areas with the greatest synergy potential, in particular procurement and production. To some degree, GEA also uses a Shared Service Center (SSC) for the areas of IT, Finance and Human Resources.

Discontinued operations

Discontinued operations comprise the remaining risks from and the ongoing process of winding up past discontinued operations, for instance from the sale in 2014 of GEA Heat Exchangers, including individual legal disputes arising from them.

Capital expenditure

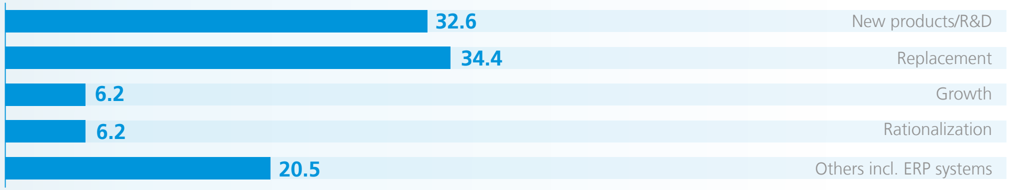
GEA develops and engineers specialized components, largely on a make-to-order basis, and also designs process solutions for a broad range of customer industries. The focus is on the food and beverage sectors. With its global engineering and production network, the group is able to provide customers with solutions that are precisely tailored to their individual requirements. Customers should also benefit from GEA's flexible production concepts, which should ensure fast throughput and low costs, and minimize tied-up capital.

At EUR 137.0 million, capital expenditure (additions resulting in cash outflows) in the year under review was on a par with the previous year (EUR 135.9 million). At EUR 73.3 million, capital expenditure in the Business Area Equipment was well down on the figure of the previous year (EUR 94.1 million), this being attributable to new products. In contrast, expenditure on ERP systems capitalized outside the Business Areas was significantly higher. At EUR 33.7 million, the investment volume of the Business Area Solutions lay just above the previous year's level (EUR 31.7 million).

The largest share of capital expenditure was accounted for by replacements (around 34 percent), as well as by R&D and new products (together approx. 33 percent), while the share of total investments attributable to ERP systems was around 18 percent.

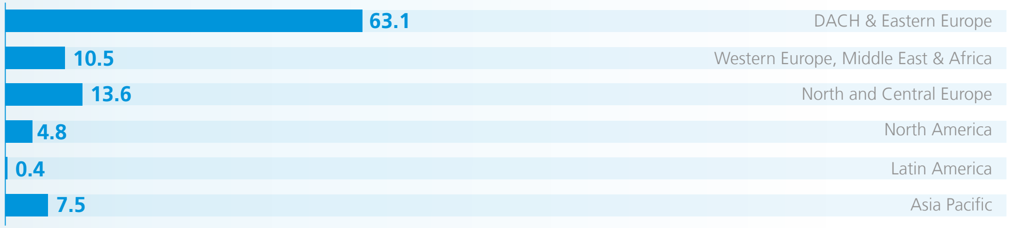
Capital expenditure in tangible and intangible assets per type

(in %)



Capital expenditure in tangible and intangible assets by region

(in %)



Management system

Basis of information

Group reports are prepared with the aid of standard applications that are precisely tailored to the needs of GEA and subject to continuous enhancement. Standard reports prepared on the basis of unified data are used throughout the group to report net assets, financial position, and results of operations. These standard reports are supplemented by special analyses as well as analyses and reports related to specific businesses and strategic measures. Besides the budget for the coming fiscal year, corporate planning covers a further two planning years.

In fiscal year 2019, routine reporting procedures were supplemented by committee meetings providing members of the group management with an opportunity to share information on strategic and operational issues. In addition, the Executive Board of GEA Group Aktiengesellschaft convened twice a month. The Extended Management Board (Global Leadership Team), which comprises the Executive Board members, the management of the two Business Area, the heads of the sales regions and representatives of the Global Corporate Center (GCC) for Finance and Human Resources, held a meeting in the first month of the respective quarter. The Executive Board meetings concentrated on issues of relevance to the group as a whole, whereas significant matters directly affecting the Business Areas and Regions were discussed at the GLT meetings. In addition, the individual Business Areas regularly held meetings. These were attended by the competent Executive Board member along with the heads of the respective Business Area, and business partners of GCC Finance. Such meetings entailed detailed discussions of the net assets, financial position, results of operations, and business development of the Business Area concerned. Separate meetings for each Business Area (in the future, for each Division) were also held to discuss earnings for the latest fiscal year and the business plan for the following years. At the start of 2020, the structure of group management was adapted to fit the group's new organizational structure (see page 263).

Key performance indicators

Key financial performance indicators in the management system in 2019

GEA's prime objective is to increase the value of the enterprise year on year. Trends in key indicators are, therefore, defining factors and an essential basis for the company's lasting success. GEA revised its management system for the 2019 financial year with the aim of simplifying value-oriented control parameters and introducing customary market indicators and, thus, safeguarding accountability, transparency and comparability. In 2019, the key financial performance indicators for GEA were as follows:

- Revenue
- EBITDA before restructuring measures
- Return on Capital Employed (ROCE)

EBITDA before restructuring measures

GEA uses EBITDA (earnings before interest, taxes, depreciation and amortization) as its chief earnings indicator. EBITDA is adjusted to take account of the effect of restructuring expenditures. The restructuring measures concerned are outlined in terms of content and scope, presented to the Chairman of the Supervisory Board by the CEO and, where required by the Board's rules of procedure, approved and finalized by the Supervisory Board. Only measures requiring funding in excess of EUR 2 million are taken into account. Accordingly, this indicator is termed "EBITDA before restructuring measures."

Return on capital employed (ROCE)

The performance indicators "revenue" and "EBITDA before restructuring measures" are supplemented by another accounting ratio, namely the ROCE or the "return on capital employed." The ROCE corresponds to the ratio of earnings before interest, taxes and restructuring measures (EBIT before restructuring measures) to the capital employed.

Capital employed includes (all items calculated as averages for the past four quarters) non-current assets less interest-bearing non-current assets and working capital plus other non-interest-bearing assets, liabilities and provisions less assets and liabilities in connection with income taxes. When calculating capital employed, the effects arising from the acquisition of the former GEA AG by the former Metallgesellschaft AG in 1999 and further effects from discontinued operations are not taken into account.

In order to anchor ROCE even more strongly at an operational level, the ROCE drivers "EBIT before restructuring measures," "working capital" or the "ratio of working capital to revenue" – the key driver of capital employed – are evaluated on a continuous basis.

As a strategic indicator, the ROCE measures the relative profitability of a company when compared with the weighted cost of capital used (WACC). If the ROCE is above the WACC, this is an indication that the business is gaining in value as the expectations of the capital market have demonstrably been exceeded.

The difference between the expected ROCE and the weighted average cost of capital (WACC) is a key criterion for investment and portfolio decisions. The group calculates WACC on the basis of specific peer-group information on beta factors, data on capital structure, and borrowing costs.

Furthermore, the indicators EBITDA before restructuring measures and ROCE are fixed elements of the new remuneration model for Executive Board members (see page 84 ff.).

Other indicators in the management system in 2019

GEA also routinely gathers various other performance indicators in order to obtain a meaningful picture of the overall situation.

Revenue is analyzed by region, application and product group on a monthly basis in order to identify market trends quickly. We also evaluate leading indicators such as the GEA Business Climate (GBC – see page 153), and order intake.

To enable a rapid response to developments, the Business Areas provided regular forecasts – for the quarters and the year as a whole – for the key performance indicators of revenue and EBITDA before restructuring measures. Beyond that, GEA makes estimates for other indicators, such as order entry, and publishes these together with the Business Area forecasts.

Management of capital employed

Resources are allocated within the group primarily on the basis of strategic and medium-term planning. This provides the framework for preparing key decisions on core technologies, sales markets, and other strategically important variables.

Acquisitions and expansion investments are assessed not only on the basis of key performance indicators showing potential returns, but also in terms of their importance for achieving the group's strategic goals. The key economic criterion for evaluating rationalization and expansion investments is the net present value. The payback period is also calculated as an additional benchmark for assessing the risk arising from changing economic conditions.

Working capital is another key element of capital employed. Working capital management begins before an order is accepted with the payment terms that are offered or negotiated.

Project- and activity-based management

In addition to general management with the aid of the key performance indicators described above, GEA has established individual assessment and approval procedures for customer and investment projects, utilizing specific thresholds for the different hierarchy levels. Customer projects are evaluated primarily on the basis of their expected margins (gross margin on a fully absorbed cost basis) and of their technical, commercial and contractual risk profile, with a particular emphasis on cash flow. Project management is also backed up by extensive project control not only at operating unit level but also – depending on the size of the project involved – at Business Area or group level in the form of a separate reporting system for major projects. In many cases, the findings gained from this analysis yield suggestions for improving internal processes, which can be used in subsequent projects. At group level, the analysis focuses on deviations between the calculated and the expected or realized contract margin.

Supply chain management

The costs of materials generated by GEA's continuing operations in 2019 totaled short of EUR 2.4 billion (previous year: EUR 2.4 billion). It is the biggest single expense item in the income statement, with stainless steel being the focus of raw material procurement. However, stainless steel merely accounted for a relatively small proportion of the overall volume required, as GEA acquires most of this commodity in the form of processed products from the market or as part of assembly services. Compared to the previous year, the average prices of the most important raw materials have seen both positive and negative changes. While aluminum, zinc and plastics prices have dropped, the price of copper and notably nickel, oil and rubber has experienced a marked rise. Steel prices developed differently. On a global level, GEA merely faced minor changes in the price of stainless steel (coils). However, in the U.S., the prices charged for some stainless steel products, such as drawn bars, which have increased significantly. On the other hand, steel prices have decreased sharply on a year-over-year basis.

GEA uses its own material group classification system to obtain information on the procurement volume as a whole. The system provides a detailed overview of suppliers as well as a regional breakdown of purchased volumes. Serving as a basis for defining the procurement strategies relevant to the principal commodity groups, the system is available to each and every GEA buyer.

Until December 31, 2019, GEA's Procurement Council was responsible for the company's procurement organization. With effect from January 1, 2020, the Executive Board introduced a new Global Procurement & Supply Chain that is to ensure clear responsibilities and interfaces. It has taken the place of the three formerly independent purchasing organizations, replacing the latter with a single, centralized entity. This setup will serve as a basis for designing the respective supply chains of the five divisions, a process that is to go hand in hand with consistent monitoring and full accountability. Apart from that, the areas of procurement, production and logistics have each reported separately to the Executive Board as of January 1, 2020.

Throughout the year 2019, GEA continued its "Supply Chain Excellence Project," a multi-phase undertaking scheduled to run until 2020 as a continuous improvement process for the purpose of unlocking optimization and savings potential in a structured manner. On top of that, the company saw the continuation of cost optimization projects within the framework of its day-to-day operations.

GEA's organization promotes the standardization of material specifications while increasing its reliance on strategic suppliers. Ultimately, this will lead to a reduction in its supplier base. By aggregating volumes and improving cooperation with suppliers, the company manages to cut handling, administration as well as unforeseen costs while establishing a uniform platform for other initiatives, compliance and innovation. Like the year before, the company continued its efforts to identify preferred suppliers for providing frequently required standard components in order to leverage the benefits of pooling in the field of procurement.

In general, GEA's supply chain is structured as follows:

In 2019, the products of the Business Area Equipment were manufactured at 36 different sites around the globe. GEA buys raw materials, semi-finished products as well as precursors and, notably, components that are not based on its own core technologies from external suppliers.

With its 25 production sites, the Business Area Solutions develops, designs and supplies process solutions for a whole variety of different applications. Within the framework of the respective projects, the company also purchases plant components while awarding work to subcontractors, in particular when it comes to on-site and assembly services. As far as the constructional steelwork sector is concerned, the respective steel is usually provided as part of the services rendered by subcontractors.

At present, ten production sites located in China, Germany, India, Italy and the U.S. are capable of manufacturing several product lines (multi-purpose sites), which places above-average demands on the supply chain while creating opportunities for the respective local suppliers. Moreover, business dynamics in the fast-growing economies and emerging nations will require more and more local procurement.

At the moment, the potential for procuring goods and services from suppliers and subcontractors in best cost countries is being further expanded with a continued focus on total cost of ownership that, in turn, reflects both quality and price. The number of such suppliers is likely to rise over the coming years. With this in mind, the company is seeking to standardize and enhance its procurement processes.

Wherever possible, GEA applies the "local for local" principle. Aside from short response times, in particular the reduction in adverse economic and ecological impacts due to fewer shipments as well as the potential stimulation of the local economy at the manufacturing and project sites represent important benefits. In general, GEA makes use of its own local procurement organizations (part of the divisions from 2020 onwards). The region of the respective supplier is identified on the basis of its sales office. For this reason, it is not always possible to provide explicit information on the origin of a product, all the more so due to the fact that while some products are manufactured in one region only, they are being sold worldwide.

Region	2019 Local procurement as a percentage of total volume (in %)*	2018 Local procurement as a percentage of total volume (in %)*
Europe/Middle East/Africa	82	89
Asia Pacific	71	72
North and South America	82	86

*) Excluding intercompany procurement

Owing to the "local for local" principle, transport and logistics account for only a small proportion of the company's total purchasing volume. In the year under review, GEA further pursued its objective of setting up a centrally managed logistics organization for the purpose of harnessing efficiency-related and ecological benefits. Global framework agreements already cover around half of all transport services commissioned by GEA. In this context, the year 2019 saw further projects in relation to both air and sea freight shipping. As to air freight, in particular, the focus was placed on stabilizing and renegotiating air shipping charges on account of capacity constraints in the market. In addition, GEA is working side by side with shipping and forwarding agents that support the company in its efforts to scale down transport emissions. These endeavors were supplemented by:

- the ongoing consolidation of GEA's requirements in terms of air and sea transport
- preparations to consolidate express packages and road-based logistics in 2020
- a special focus on minimizing the number of consignments
- the recording and standardization of logistics processes

GEA has made arrangements for the post-Brexit period: For example, to avoiding shipping delays and delayed deliveries, the company closely monitors inventories and has implemented specific processes for ensuring that operations are running as smoothly as possible.

Due to its multitude of suppliers, GEA does not experience any dependency issues. The company's hundred largest suppliers account for roughly one quarter (27.4 percent) of GEA's overall procurement volume, while around 200 suppliers provide for approximately 37 percent (37.0 percent) of this volume.

For more information on responsible supply chains, please refer to the relevant sections of the Sustainability Report; for environmental aspects see page 129 f.; for human rights see page 145 f.

Research and Development

The primary objective pursued by an engineering group like GEA is to offer bespoke customer solutions that provide outstanding product and process efficiency allowing the company to successfully compete on a global scale. Efficiency implies a minimum input of energy, the conservation of natural resources and a high level of recyclability, always in relation to optimized performance. For this reason, GEA's in-house innovative strength is key to its future success in business and further growth.

GEA's research and development (R&D) activities are subsumed under its core value proposition and corporate claim "engineering for a better world". By coming up with more and more efficient products and process solutions, GEA contributes to ensuring the responsible design of value creation processes, sustainable management and the protection of the natural environment.

For this reason, a number of key R&D efforts focus on the development of efficient process technologies and their contribution to value creation processes. This is GEA's way of dealing with macroeconomic trends like a growing world population and spreading urbanization. After all, the consequences become particularly apparent in the food and pharmaceutical sectors served by GEA: consumers set highest standards in terms of the safety, quality and service life of their products, a challenge that may be met particularly with the help of industrial process engineering.

In addition to conducting in-house research and development, the company engages in projects where it connects with customers and suppliers as well as research partners, the public sector, and selected start-ups. GEA is boosting its culture of innovation, making sure that the company keeps pace with the dynamic changes in industry and society. This way, GEA sustainably strengthens its leading edge in technology.

For this reason, GEA regularly invites customers, research partners as well as selected start-ups to attend a "GEA Innovation Forum." Under the theme "Open Innovation," the event held in the year under review focused on sharing knowledge on topics like agile product development and the role of external networks and partnerships. Exploring new avenues in innovation management, GEA organized its first Corporate Makeathon involving approximately 60 international students in 2019. This way, GEA – in cooperation with its partner, the Fraunhofer Institute for Mechatronic Systems Design (IEM) – has advanced the debate about trending topics like artificial intelligence, data analytics, gamification and green energy production.

As part of the restructuring process and for the purpose of further reinforcing the strategic focus on technology and engineering, GEA established its own dedicated organization that directly reports to GEA's Executive Board in 2019: "Global Technology" aims at safeguarding GEA's technological competitiveness. Furthermore, the new global organization – which became operative in January 2020 – is to ensure that GEA technologies are aligned with relevant market trends while meeting ever-changing customer needs.

In this context, the digitalization of business models plays a major role that will shape process design and tomorrow's world of work. As an engineering company, GEA is seeking to harness the opportunities of digital transformation for the long run: Thus, the latter is part and parcel of GEA's innovation process and occupies a special place within the new Global Technology organization. The goal is to develop plants, products and processes that easily adjust to changing market conditions by means of digitalization. Integrated business processes, connected production data as well as smart data analysis tools are to boost plant safety, performance and service life, while downtime and capacity bottlenecks are kept to a minimum. In doing so, GEA makes planned components and plants come to life by means of virtual reality before they are actually built. This way, various options may be illustrated and discussed in advance during the plant design process, enabling GEA's customers to attain optimal product quality. Moreover, this approach reduces follow-up costs for changes that may otherwise arise during or following the construction phase.

In addition, the company advances the development of digital user training courses by means of targeted training simulations. For this purpose, GEA engages in the digital modeling of production processes to ensure that future users may virtually familiarize themselves with the systems. This is necessary to deliver appropriate training to operating personnel in light of increasing plant automation. Extensive user training on the actual plants entails downtime as well as a loss of production. On the other hand, a lack of know-how leaves users with a feeling of uncertainty, in particular during the start-up phase or outside peak times. Coupling the quasi-original "human machine interface" (HMI) with the digital models of the programmable logic controller (PLC) as well as the production process allows the user to train and control the production process by making use of the digital model. In fiscal year 2019, GEA filed a corresponding patent application for training courses focused on controlling complex spray drying plants. In addition, GEA successfully supported a global malt supplier in the introduction of a new, highly automated GEA evaporator line by delivering extensive virtual commissioning and operator training.

On top of that, GEA is continuously striving to further develop and enhance its digital software solutions like GEA OptiPartner, the company's service product employed in production lines. Such solutions embrace complex production processes that are subject to external disturbances and fluctuations, for example in terms of raw material quality or ambient conditions. Frequently, traditional process control measures reach their limits when it comes to such process disturbances, which may result in production losses. The OptiPartner autopilot control serves the purpose of promptly dealing with operational fluctuations while simultaneously enhancing process performance. At the same time, the digital service product covers the entire lifecycle of process optimization – from remote services for tuning to software updates to performance monitoring for the purpose of continuous improvement.

Another emphasis of GEA's digital product portfolio is cloud-based service solutions: At the IFFA, the leading international trade fair for the meat processing industry that took place in Frankfurt am Main in spring 2019, the company showcased its innovative cooperation with MachIQ, for the very first time. MachIQ is a former start-up that has emerged from the "MassChallenge Switzerland," a network driving innovation (see page 46). The supplier-independent, cloud-based asset management system of MachIQ represents the bedrock for shaping and designing GEA's future digital service portfolio. The portal offers customers state-of-the-art solutions like remote maintenance, data analysis or e-purchasing functions that are gradually integrated into the GEA landscape. This allows customers to seamlessly integrate all interactions with various suppliers via a joint platform.

To leverage continuously growing data volumes, GEA laid the foundation for a digital analytics platform during the 2019 fiscal year, with a platform that is to be gradually extended to include internal and external user groups. This way, data may by captured, stored and ultimately analyzed with the help of cutting-edge, cloud-based technologies. Going forward, the company seeks to make GEA’s digital services available via a cloud platform – both to external customers and internal users. The upside of cloud-based services is that they are scalable, cost-efficient and innovative as they afford their users the possibility to engage in agile research while allowing the development of new, digital services without a great deal of effort and cost. At the same time, they pave the way for the transfer of knowledge.

In fiscal year 2019, GEA launched an initiative to meet customer demands in terms of sustainability. “SEnS,” short for “Sustainable Energy Solutions,” stands for long-term energy solutions offering lower energy consumption levels, minimized operating costs as well as a reduced carbon footprint that may go as far as climate-neutral emissions. Energy efficiency plays a key role in achieving the sustainable development goals, especially in the processing industry. Heat generation and subsequent cooling account for a major part of the costs involved in food processing since the food, drink and dairy processing sectors require precise temperatures for ensuring top product quality. By relying on energy-efficient cooling and heating solutions as well as natural refrigerants like ammonia and CO_2, plant operators may generate up to 90 percent of their required heat from waste heat produced during the cooling process. This will lower their energy costs by up to 30 percent. GEA’s SEnS experts take a holistic approach along the entire process chain in their quest to optimize both the demand for and the use of heating and cooling for realizing significant savings in energy. In this context, SEnS provides solutions for operators of both planned and existing plants and facilities. For this purpose, a GEA team of experts in process engineering, sustainability, cooling and heating technology is working on a comprehensive proposal for a more sustainable and integrated process solution within the framework of this initiative.

To accelerate development projects during the early phase of innovation, GEA connects with stakeholders from the science and industry community like the MassChallenge Switzerland Business Accelerator Program of which GEA is a founding sponsor. Since 2016, GEA has played an active part in the start-up community, focusing primarily on nutrition, health and energy. In 2019, the year under review, the program provided support and assistance to 89 start-ups from 18 countries. Out of an original number of more than 1,000 applications under the MassChallenge accelerator program, the finalists were selected within the framework of two rounds of judging performed with the assistance of GEA experts. In the year under review, the program gave specific priority ideas for driving greater sustainability. In total, the top 12 finalists received cash awards in the amount of 0.5 million Swiss francs. One of the highlights was the “Sustainability Challenge in Food and Packaging” – a workshop format that provides a platform allowing start-ups, sponsors and experts to meet on an equal footing and discuss new approaches to packaging technology as well as alternative protein sources. This event was attended by GEA representatives from two business units and the company’s innovation team.

In May 2019, GEA also chose the IFFA leading international trade fair for the meat processing industry to showcase FoodTray, a novel system solution for more sustainable food packaging. FoodTray was developed in collaboration with various partners who jointly devised a more ecological packaging solution that consists of corrugated cardboard and plastic film. Fossil-based raw materials are replaced with fibers from renewable raw materials, which reduces the use of plastics in packaging by up to 80 percent. All components are 100 percent recyclable. Both material components are compatible with GEA’s PowerPak PLUS packaging machine. During this process, the film is thermoformed and sealed directly to the inside of the cardboard box, which allows the end consumer to separate the two components and place them into the respective dedicated recycling systems after use. This type of sustainable food packaging will be available in German supermarkets around mid-2020 onwards.

In the 2019 fiscal year, GEA also developed a new pilot plant for freezing bacteria with liquid nitrogen that made its debut at the "Fi Europe" – the "Food ingredients Europe" trade show – in Paris, in December 2019. Many milk and food processing companies and manufacturers of probiotic products use living bacteria in their production processes – for yoghurt or cheese, for example. Traditionally, they have relied on their own bacterial strains, transferring them from one batch to the next. However, the emergence of more and more specialized strains of bacteria has made it increasingly necessary to make them more widely available. For this purpose, the bacteria are typically frozen at –50 Celsius and stored under temperature-controlled conditions until they are used. However, this requires an unbroken cold chain, which may be no problem in developed countries, but more challenging elsewhere. For this reason, freeze-dried bacteria have become a popular option, because they can be transported and stored at ambient temperature and rehydrated as required. That said, freeze drying bacteria involves a complicated process. With its pilot plant, GEA has broken new ground. The bacteria are frozen in droplets using a liquid nitrogen bath outside the freeze dryer, whereupon the pellets are dried via the normal procedure. Going forward, this will give the processors more flexibility while simultaneously providing them with a larger number of active cells. Additionally, customers will be able to save costs due to the higher utilization of their fermentation plants and freeze dryers. GEA's pilot plant will allow food and dairy processing companies to run extensive trials and tests to explore the new technology in advance at their own respective sites.

In fiscal year 2019, another focus of R&D was once again placed on creating additional value from by-products – for instance in the field of agriculture. One example is hygienic treatment of previously disposed-of side streams and reintroducing them into the food and animal feed cycles as high-quality reusable materials. For this purpose, GEA has been involved in the EU SABANA (Sustainable Algae Biorefinery for Agriculture and Aquaculture) project since 2016. The partners are setting up a production plant (DEMO 1) for microalgae cultivation on a 1.4-hectare plot in Almería, Spain, which is to commence full-scale operations in the first quarter of 2020. So far, the project has included a cultivation pilot on an 800 m^2 plot. The algae farm uses municipal sewage, diluted manure and seawater to produce biofertilizers and biostimulants for the agricultural sector as well as feed additives for fish farms and other types of aquafarming. For the pilot, GEA supplied a disc stack separator for harvesting the microalgae, a high-pressure homogenizer for cell disruption as well as a spray dryer for drying the biomass. The engineering work for the DEMO 1 production plant was completed in 2019.

In 2019, GEA also continued its work on the "Pro-Enrich" EU development project, which has the same focus. The project unites GEA, various food companies and ingredient manufacturers in an effort to produce functional proteins and bioactive ingredients for food, cosmetics and animal feed applications. For this purpose, the parties involved make use of side streams from the olive oil, rapeseed oil, tomato and citrus industries. Their aim is to set up a closed bio-economic cycle. New processes for treating such by-products – that will rely on mechanical separation processes as a key technology – are to be further developed to help save more resources while gaining market readiness. The project headed by the "Danish Technological Institute" (DTI) is set to continue until 2021.

Another project run by the DTI – in this case managed by the affiliated "Danish Meat Research Institute" (DMRI) – is the "ProChick" development project which receives funding from the Danish state. Within the framework of this project, GEA, a Danish poultry meat producer, the University of Copenhagen as well as further local companies are taking a closer look at side streams from the poultry meat industry that are approved for human consumption. They are seeking to generate superior, functional proteins for the food industry to enhance added value. A process ensuring gentle product handling has already been successfully tested on a pilot scale.

GEA continues to pursue the “Protein and Lipid Extraction from Insects” project, which forms part of yet another key field of research that focuses on alternative proteins for human and animal consumption. At present, the environmental impact of conventional protein production in agriculture and fishery is already being felt and will worsen due to the growth in population. Insects and their larvae could serve as new sources of protein and fat, providing a solution that is sustainable in multiple respects: Measured by protein content, their cultivation and nurture require comparatively few resources, which, in turn, frees up more farmland for supplying food for human beings instead of growing animal feed. Moreover, serving as a substitute for fishmeal, they also reduce ocean overfishing. GEA offers basic technologies that may be transferred to this new market along virtually all stages of the value chain. A decisive step was already taken in November 2018, when GEA put into operation its first industrial plant on behalf of the world’s largest fly larvae producer in South Africa, which produces protein and fat from black soldier fly larvae to fortify fish feed. GEA supplied decanters, separators, pumps, heat exchangers, valves, the cleaning unit as well as plant automation technology and will continue to optimize and streamline the processes on site. A research project conducted in tandem with the Australian animal feed start-up, Future Green Solutions, commenced in late 2018. Following successful trials in the year under review, a pilot plant, which includes centrifugal separation, technology is to be built by GEA.

Despite the previous year’s successful completion of the DRIVE4EU project, designed to explore whether Russian dandelion could serve as an alternative to tropical rubber trees in the production of natural rubber, GEA and its partners continued refining the process during the 2019 fiscal year; subsequently, a patent application was filed. As part of this project, GEA assisted in developing a biorefinery process that enabled GEA decanters to extract both natural rubber and inulin on a pilot scale, whereupon the latter was tested in products and analyzed. Finally, the partners succeeded in manufacturing prototype bicycle and vehicle tires. The material properties were impressive: ageing was similar to that of conventional rubber while tire grip was superior, with processing proving simpler than anticipated. Following the project, GEA and one of the other former project partners have successfully produced rubber in a temporary pilot plant, and have plans to further market this innovation.

As one of the leading suppliers of process technology in the dairy sector, GEA is continuously advancing its technologies to support its customers in the areas of animal health, product quality, productivity and economic efficiency. For instance, GEA launched its “GEA DairyMilk M6850” cell count sensor in 2018; since then it has won several awards, most recently at the FIGAN, the international exhibition of animal production that took place in Zaragoza, Spain, in spring 2019. On this occasion, the system won the “Technical Innovation Award,” its third prize since being commercially launched. The sensor detects mastitis in cows at an early stage, which is critical give that cell count concentration in milk is indicative of udder infections. This technology represents the world’s first somatic cell count system that continuously analyzes the milk in each individual quarter of the udder throughout the entire milking process, helping minimize the time required for medical treatment while ensuring the healing process and guaranteeing the productivity of a healthy herd. The GEA DairyMilk M6850 requires no additional consumables, which makes it one of a kind in the market.

In the year under review, GEA also received further awards underscoring the company's capacity for innovation:

In 2019, two awards from a competition in Australia went to the GEA Visitron ALL-IN-ONE monoblock filler. At the AUSPACK Conference in March 2019, the Australian Packaging and Processing Machinery Association (APPMA) selected the best packaging innovations and products of the year. In this context, GEA VIPOLL received two awards for its ALL IN ONE monoblock filler in two categories: "Best New Product" as well as "Best Imported Equipment." The multifunctional system provides an unprecedented level of flexibility to beverage manufacturers with medium capacities. For instance, it fills cans, glass or PET bottles and is capable of handling a wide range of formats. Highly flexible, the solution makes it possible to handle and cap various closure types on one turret, in different combinations. The basic ALL-IN-ONE model for lower capacities is designed to cap one type of lid and one type of crown cork on the same turret. The system is able to fill carbonated or still drinks in hot and cold processes. Thus, GEA's innovation meets customers' needs for efficiency and flexibility while simultaneously conserving resources. In 2018, GEA's partner Foodmach integrated the ALL IN ONE into a line for the Lion's Malt Shovel Craft Brewery owned by one of Australia's largest food and beverage companies.

Another award-winning system is GEA's integrated CALLIFREEZE freezer control system. At CFIA 2019, the trade fair for the food packaging and processing industry in France, CALLIFREEZE won the innovation award in the "Equipment and Processes" category. The freezer control system, developed in 2017, continuously monitors the condition of the products exiting the freezer (for instance meat, poultry and pastries), automatically adjusting retention time in the freezer, air temperature as well as fan speed to achieve the precise level of freezing required with minimum energy consumption. The new system reduces power consumption while improving plant efficiency. Currently, CALLIFREEZE is the world's first in-line system to autonomously monitor and control frozen product quality in this manner, helping customers meet their Industry 4.0 strategies as well as their environmental targets. In fiscal year 2019, GEA successfully concluded trials on a French fries production line in the Netherlands, proving the effectiveness of its control system.

As a cutting-edge technology, the GEA CookStar won the renowned Gulfood Manufacturing Industry Excellence Award 2019 in the "Top Futuristic Technology" category in Dubai. Gulfood Manufacturing is the largest specialist trade fair for the food and beverage industry in the Middle East. On this occasion, GEA offered its exhibition stand visitors the possibility to explore the inside of the GEA CookStar by means of virtual reality. The GEA CookStar represents the world's only double spiral oven with a three-phase cooking set up. Its patented design combines horizontal and vertical air flows in a turbo and/or fast cooking zone. This reduces cooking time and delivers a higher yield compared to ovens that are only equipped with horizontal air flow. The new three-phase cooking system allows for the industrial preparation of food according to individual customer tastes, which means that food may be cooked, roasted, smoked or air-dried. At the same event, the GEA MultiJector with 2mm injector needles was nominated in the category "Most Innovative Processing Solution."

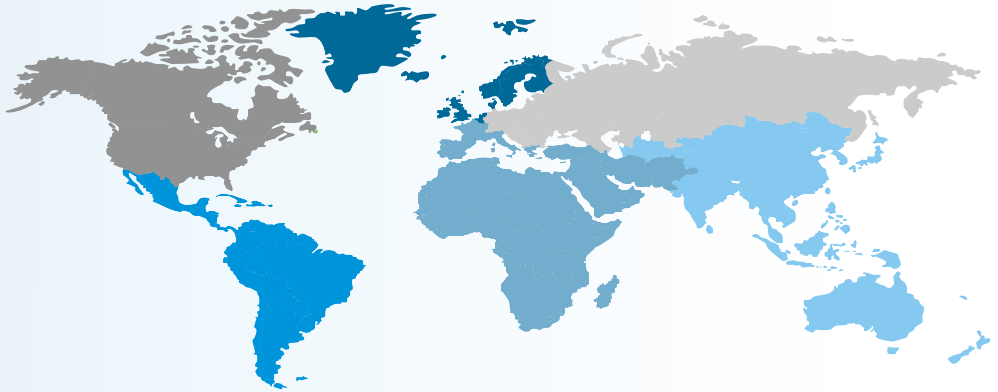
Furthermore, in the year under review, GEA also won an award in the field of compressor technology. At the Busworld, the world's largest specialist exhibition for buses and coaches in Brussels, Belgium, the GEA Bock StarCO_2mpressor received the "Busworld Innovation Label Award 2019." The compressor is part of the new generation of mobile CO_2 compressors for electric bus and railway air conditioning and heating. This market innovation features an innovative "star" drive gear design, which opens up new possibilities for economical and more sustainable mobile electric bus and railway air conditioning.

In fiscal year 2019, GEA filed applications for a total of 73 (previous year 69) new patent families as a result of its extensive research and development endeavors. Overall, GEA holds around 1,000 patent families comprising approximately 5,200 individual patents in the following key disciplines: separation technology, drying processes and powder processing, refrigeration and freezing technology, energy supply, liquid and food processing, filling and packaging, homogenization, farm technology as well as materials handling technology including pumps and valves.

In the 2019 fiscal year, expenses for research and development totaled EUR 127.9 million (previous year: EUR 119.9 million). This figure includes third-party contract costs for R&D in the amount of EUR 16.8 million that are recognized under cost of sales. At 2.6 percent, the company's R&D ratio was slightly higher than in the previous year (2.5 percent). Regular depreciation of capitalized development projects amounted to EUR 20.3 million in the year under review (previous year, corrected: EUR 21.9 million). Capitalized development expenses added up to EUR 32.5 million versus EUR 37.6 million in the prior year. Compared with EUR 135.7 million the year before, expenditure for research and development accounted for a total of EUR 140.0 million.

Research and development (R&D) (EUR million)	2019	2018	Change in %
Third-party contract costs	16.8	18.2	–7.5
For GEA's own purposes	111.1	101.8	9.1
R&D expenses – total	**127.9**	**119.9**	**6.6**
R&D ratio (as a percentage of sales)	**2.6**	**2.5**	**–**
R&D expenditure – total	**140.0**	**135.7**	**3.2**
R&D expenditure ratio (as a percentage of sales)	**2.9**	**2.8**	**–**

Report on Economic Position



North America
Employees: 1,675
Revenue: 890 million

North and Central Europe
Employees: 3,072
Revenue: 684 million

DACH & Eastern Europe
Employees: 6,861
Revenue: 1,000 million

Latin America
Employees: 512
Revenue: 365 million

Western Europe, Middle East & Africa
Employees: 3,278
Revenue: 814 million

Asia Pacific
Employees: 3,092
Revenue: 1,126 million

= Employees (FTEs) = Revenue

GEA in fiscal year 2019

The forecast for fiscal year 2019 was based on the assumption that there would be no significant slowdown in global economic growth. Potential acquisitions and divestments in 2019 have not been factored into the key performance indicators.

In its report for the third quarter of 2019, GEA raised its revenue forecast from "moderately below the previous year's level" to "on a par with the previous year." The updated forecast now reads as follows:

- Revenue on a par with the previous year (EUR 4,828 million)
- EBITDA before restructuring measures of between EUR 450 and EUR 490 million
- ROCE of between 8.5 and 10.5 percent

GEA slightly exceeded its original forecasts for both revenue and ROCE. Despite impacts from various special effects (about EUR 41 million), EBITDA before restructuring measures, which amounted to EUR 479.2 million, occupied the upper end of the predicted corridor. The outlook for revenue – raised slightly in the third quarter of 2019 – was also achieved. Contrary to original expectations, a major decline in EBITDA before restructuring measures failed to materialize either at Business Area Solutions or the Global Corporate Center.

The section "Course of business" provides more information on GEA's business development.

Fiscal year 2019	Revenue	EBITDA before restructuring measures	ROCE
Outlook 2019	**moderately below the previous year's level**	**EUR 450 – 490 million**	**8.5 – 10.5%**
Update of October 2019	on a par with the previous year	confirmed	confirmed
Actual 2019	**1.1% above the previous year's level**	**EUR 479 million**	**10.6%**

The figure for EBITDA before restructuring measures projected in the 2018 Annual Report was adjusted for a proforma effect of EUR 59 million arising from the initial application of IFRS 16, "Leases" (see page 127 of the 2018 Annual Report). The proforma value calculated for 2019 is, however, EUR 67.3 million.

Macroeconomic environment

As a global technology company, GEA considers growth in gross domestic product (GDP) and hence the International Monetary Fund's (IMF) assessments in this regard to be key benchmarks for its own development. The forecasts ventured by the United Nations and the World Bank Group are other key indicators for this macroeconomic environment.

According to the IMF, the global economic situation stabilized slightly in the year under review (World Economic Outlook, January 2020). According to its latest estimates, the world's economy grew by 2.9 percent in 2019. However, the downward revision of 0.1 percentage point in the forecast for 2019 compared with the last estimate in October was mainly due to disappointing data on economic activity from several emerging and developing countries. This affected India in particular, but also Mexico and South Africa. This data largely concerned country-specific matters that had a negative impact on domestic demand. As expected, growth in the industrialized nations slowed somewhat against a backdrop of weaker U.S. growth. In the year under review, therefore, the figure for economic growth is expected to stand at 1.7 percent in the industrialized nations and at 3.7 percent in the emerging and developing countries.

In its most recent economic report ("World Economic Situation and Prospects 2020"), the United Nations (UN) reaffirmed its prediction of a global growth rate of just 2.3 percent for 2019 (previous year: 3.0 percent), the lowest in 10 years. According to the UN, chief among the difficulties for global trade in 2019 were the protracted trade disputes and far-reaching political uncertainty. The UN assumes that growth in the industrialized nations will stand at 1.7 percent by the end of 2019; as for the emerging markets, the growth rate is expected to amount to just 3.4 percent.

In the most recent issue of its "Global Economic Prospects," the World Bank Group predicted that global economic growth would probably slump to 2.4 percent for 2019, after forecasting in June that it would probably reach 2.6 percent – representing the weakest global expansion since the financial crisis a decade ago. The reasons for this include the numerous trade conflicts around the world, the proliferation of geopolitical tension, and the effects of extreme weather events. It is estimated that economic growth in the industrialized nations in 2019 will amount to 1.6 percent, while the emerging and developing economies are expected to expand by 3.5 percent.

Figures published by the German Engineering Association (VDMA) indicating a 9 percent decline in orders compared with a year ago are a reflection of the current situation in the engineering sector. Domestic and foreign orders contributed in equal measures to the slump. According to the VDMA, chief among the reasons for the uncertainty and reticence to invest are international trading disputes, increasing protectionism, the Brexit debate and fundamental structural change taking place within the automobile industry.

Significant changes

Supervisory Board

On April 24, 2019, GEA Group Aktiengesellschaft's Annual General Meeting elected Colin Hall to the Supervisory Board. The American is Head of Investments at Groupe Bruxelles Lambert (GBL) and also CEO of Sienna Capital, a wholly owned subsidiary of GBL. The Düsseldorf District Court appointed Mr. Hall to the Supervisory Board in November 2018 following Prof. Dr. Ing. Werner J. Bauer's decision to step down.

Management

On February 18, 2019, Stefan Klebert was appointed CEO of GEA Group Aktiengesellschaft, of which he has been a member since November 15, 2018. His predecessor, Jürg Oleas, left the company on February 17, 2019. In addition to Human Resources, Communication, Marketing & Branding, Corporate Development, Internal Audit, and Legal & Compliance also fall under Stefan Klebert's remit. He is also the Labor Relations Director. During the 2019 financial year, he was additionally responsible for the Business Area Solutions following the departure on March 13, 2019, of Executive Board member Niels Erik Olsen. In the spring of 2019, the Supervisory Board and Niels Erik Olsen agreed to prematurely terminate Mr. Olsen's service agreement, which was originally due to expire on December 31, 2021.

Marcus A. Ketter started work as GEA's CFO on May 20, 2019. His predecessor, Dr. Helmut Schmale, left the company on May 17, 2019.

In June 2019, board member Martine Snels elected not to extend her contract with GEA (due to expire at the end of September 2020) and left the company with effect from December 31, 2019. Following Ms. Snels' departure, her area of responsibility for GEA's regions and countries was transferred to Stefan Klebert.

In October 2019, the Supervisory Board of GEA Group Aktiengesellschaft appointed Johannes Giloth to the company's Executive Board with effect from January 20, 2020, where he will be responsible for the new executive mandate of procurement, production and supply chain. Johannes Giloth joined GEA from the telecommunications group Nokia, where he was Chief Procurement and Chief Supply Chain Officer for several years, successfully implementing projects to digitalize procurement and supply chain organizations.

As such, at the end of the 2019 fiscal year, GEA was managed by a team of four Executive Board members. This structure was adjusted again in the wake of Steffen Bersch's exit from the Executive Board on February 29, 2020 (see pages referring to 24 and 284 ff.).

New organizational structure (as of January 1, 2020)

On June 24, 2019, GEA presented the fundamentals of its new organizational structure, which was rolled out in full on January 1, 2020. GEA's previous organizational structure comprised two Business Areas, namely Equipment and Solutions. The lines of business combined within these two areas bundled different technologies. For this reason, they were replaced by a clear divisional structure in which the various operating segments comprise similar or complementary technologies (see page 38 f.).

Restructuring measures to be implemented by the end of 2020

GEA introduced various restructuring measures in the last financial year. The goal is to drive the Group's efficiency in the long term by improving revenue per employee, which has declined in recent years. Given detailed planning and partial roll-out of the restructuring programs proceeded much quicker than originally anticipated, GEA was able to recognize the provision for expected restructuring expenses in 2020 as early as the end of 2019. Originally estimated at no more than EUR 55 million, the amount at EBITDA level finally stood at EUR 105 million in fiscal year 2019. The difference resulted almost exclusively from advance restructuring expenses of around EUR 47 million for the scheduled workforce reduction of around 800 employees and temporary staff by the end of 2020.

Divestments

As announced at its Capital Markets Day in September 2019, GEA is planning to sell selected business operations in the Farm Technologies and Refrigeration Technologies divisions as part of the Group's continuing focus on its strategic core industries: the food, chemical, and pharmaceuticals industries. In this context, GEA announced in October 2019 that it was considering selling compressor manufacturer GEA Bock in 2020.

As part of ongoing efforts to restructure and optimize the former Business Area Solutions, GEA sold the company de Klokslag, including its two subsidiaries: de Klokslag Automatisering B.V. and de Klokslag Machinefabriek B.V. (all headquartered in Bolsward/Netherlands) to Yellow B.V., Langelo/Netherlands with effect from November 6, 2019.

Course of business

The following explanation of GEA's course of business relates initially to its continuing operations, i.e. to its two operating Business Areas. The quarterly information contained in the management report is sourced from unaudited quarterly financial statements, as well as from the half-yearly report reviewed by an auditor. All amounts have been rounded using standard rounding rules. Adding individual amounts together may, therefore, result in rounding differences in some cases.

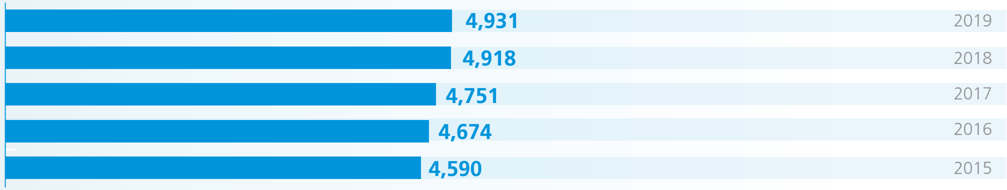
Order intake

The group's order intake for the whole of 2019 amounted to EUR 4,931.1 million, just above the previous year's level of EUR 4,917.7 million – a new record for GEA (since the sale of GEA Heat Exchangers). This slight increase was attributable mainly to the Business Area Equipment. Adjusted for exchange rate fluctuations (plus 0.9 percent), the change in order intake amounted to minus 0.6 percent. With the exception of projects with order volumes in the range of EUR 1 to EUR 5 million, order intake rose across the board.

Order intake (EUR million)	2019	2018	Change in %	Adjusted growth in %
BA Equipment	2,690.3	2,662.4	1.0	0.4
BA Solutions	2,517.4	2,499.1	0.7	–0.4
Consolidation	–276.5	–243.7	–13.4	–
GEA	**4,931.1**	**4,917.7**	**0.3**	**–0.6**

Growth in order intake declined notably in the Pharma and Dairy application centers (Business Area Solutions), as well as in the Milking & Dairy Farming product group (Business Area Equipment). This was, however, compensated by, in some cases, double-digit growth in the Beverages application center (Business Area Solutions) and in the Separation, Homogenizers, Flow Components and Compression product groups (Business Area Equipment).

Order intake for the last 5 years
(EUR million)



GEA secured 17 major orders (volumes exceeding EUR 15 million) in the reporting year, with a combined value of over EUR 350 million. Most orders came from the dairy and beverage sector. In addition, the company acquired three coffee projects, a pharma project, and also posted a major order from the meat-processing industry. A majority of these projects came from customers in the regions of North America, Asia Pacific as well as Germany, Austria, Switzerland (DACH) & Eastern Europe. In the previous year, GEA posted 13 major orders with a total volume of almost EUR 330 million.

Order intake[1] GEA

Order intake[1] GEA	Change 2019 to 2018	Share[2] of order intake in %
PGs Food Processing & Packaging; Pasta, Extrusion & Milling	↘	10
PGs Separation, Homogenizers, Flow Components, Compression	↗	25
PGs Milking & Dairy Farming	↘	10
Business Area Equipment	→	**50**
APC Dairy	↘	10
APC Beverage	↑	10
APC Food	→	10
APC Utilities	→	10
APC Pharma	↓	5
APC Chemical	↘	5
Business Area Solutions	→	**50**
GEA	→	**100**

↑ > 5 percentage points ↗ 1 to 5 percentage points → 1 to –1 percentage points ↘ –1 to –5 percentage points ↓ < –5 percentage points

1) External business only; PGs = Product Groups, APC = Application Center
2) Split rounded to nearest 5 %

While order intake declined notably in North America, adjusted order growth in Latin America was up by more than 11 percent.

Order backlog

Expressed in terms of the order intake for the fiscal year, the order backlog as of December 31, 2019, amounted to 5.9 months (previous year: also 5.9 months). In line with the different types of business performed, the order backlog ranged from three to four months in the Business Area Equipment to around eight months in the Business Area Solutions.

Order backlog (EUR million)	12/31/2019	12/31/2018	Change in %	Change (absolute)
BA Equipment	769.6	793.5	–3.0	–23.9
BA Solutions	1,716.2	1,687.2	1.7	29.1
Consolidation	–73.5	–64.4	–14.1	–9.1
GEA	**2,412.4**	**2,416.3**	**–0.2**	**–3.9**

Revenue

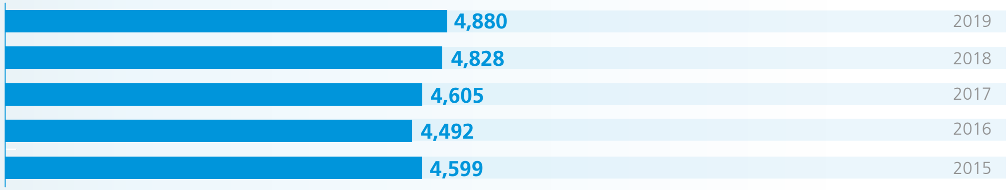
Revenue in 2019 also hit a new high in the current structure – rising slightly by 1.1 percent to EUR 4,879.7 million after EUR 4,828.2 million in the previous year. Adjusted for exchange rate fluctuations (plus 1.0 percent), revenue in the 2019 fiscal year was up slightly by 0.1 percent on the prior year. Service business generated above-average, adjusted growth of 4.7 percent, increasing its share of revenue from 30.9 percent in 2018 to 32.3 percent in the year under review.

The book-to-bill ratio, i.e. the ratio of order intake to revenue, was 1.01 in 2019 – still above 1, albeit slightly lower than the previous year's ratio of 1.02.

Revenue (EUR million)	2019	2018	Change in %	Adjusted growth in %
BA Equipment	2,682.2	2,627.6	2.1	1.3
BA Solutions	2,462.5	2,441.1	0.9	–0.2
Consolidation	–265.0	–240.4	–10.2	–
GEA	**4,879.7**	**4,828.2**	**1.1**	**0.1**

Revenue for the last 5 years

(EUR million)



Revenue fell in the Food and Chemicals application centers (Business Area Solutions), and in the Milking & Dairy Farming product group (Business Area Equipment). This was, however, more than compensated by, in some cases, double-digit growth in the Beverages application center (Business Area Solutions) and in the Separation, Homogenizers, Flow Components and Compression product groups (Business Area Equipment).

Revenue[1] GEA	Change 2019 to 2018	Share[2] of revenue in %
PGs Food Processing & Packaging; Pasta, Extrusion & Milling	↘	10
PGs Separation, Homogenizers, Flow Components, Compression	↑	25
PGs Milking & Dairy Farming	↘	15
Business Area Equipment	↗	**50**
APC Dairy	↗	15
APC Beverage	↑	10
APC Food	↓	5
APC Utilities	↗	10
APC Pharma	↓	5
APC Chemical	↓	5
Business Area Solutions	→	**50**
GEA	↗	**100**

↑ > 5 percentage points ↗ 1 to 5 percentage points → 1 to –1 percentage points ↘ –1 to –5 percentage points ↓ < –5 percentage points

1) External business only; PGs = Product Groups, APC = Application Center
2) Split rounded to nearest 5 %

A decline in revenue was observed only in DACH & Eastern Europe, and in Western Europe, the Middle East & Africa. All other regions posted growth in revenue, the highest adjusted figures being recorded in Latin America and North and Central Europe.

Revenue by regions GEA	Change 2019 to 2018	Share of revenue in %
Asia Pacific	↗	23
DACH & Eastern Europe	↘	20
North America	↗	18
Western Europe, Middle East & Africa	↘	17
North and Central Europe	↑	14
Latin America	↑	7
GEA	↗	**100**

↑ > 5 percentage points ↗ 1 to 5 percentage points → 1 to –1 percentage points ↘ –1 to –5 percentage points ↓ < –5 percentage points

Business Area Equipment

The Business Area Equipment established a new revenue record of EUR 2,682.2 million (previous year: EUR 2,627.6 million), posting growth of 2.1 percent. Based on constant exchange rates, revenue growth was 1.3 percent. The reported increase came from the Separation and Flow Components product groups.

The Business Area Equipment increased revenue primarily in the Asia Pacific region, posting adjusted growth of almost 15 percent. The most significant sales regions are now DACH & Eastern Europe, North America and Asia Pacific, each of which enjoys a share of revenue in excess of 20 percent.

Adjusted for exchange rates, service business grew by 5.9 percent in the reporting year – a rate that is well above average. Its share of the Business Area's total revenue increased to 38.7 percent after 37.0 percent in the previous year.

Revenue by regions Business Area Equipment

	Change 2019 to 2018	Share of revenue in %
Asia Pacific	↑	21
DACH & Eastern Europe	→	23
North America	↘	20
Western Europe, Middle East & Africa	↓	17
North and Central Europe	↘	13
Latin America	↑	7
Business Area Equipment	↗	**100**

↑ > 5 percentage points ↗ 1 to 5 percentage points → 1 to –1 percentage points ↘ –1 to –5 percentage points ↓ < –5 percentage points

Business Area Solutions

At EUR 2,462.5 million, revenue in the Business Area Solutions was 0.9 percent up on the previous year (EUR 2,441.1 million). Adjusted for exchange rate movements, however, the change was minus 0.2 percent. The reported increase came mainly from the Beverages and Utilities application centers.

The Business Area Solutions increased revenue primarily in the North and Central Europe and North America regions. Adjusted growth in the former was a gratifying 14 percent. The Asia Pacific region continues to impress with the biggest sales figures and a share of revenue of more than 26 percent.

Adjusted for exchange rates, the volume of service business was 3.7 percent above the level of the previous year. Its share of the Business Area's total revenue increased to 24.2 percent after 23.3 percent in the previous year.

Revenue by regions Business Area Solutions

	Change 2019 to 2018	Share of revenue in %
Asia Pacific	↘	26
DACH & Eastern Europe	↓	18
North America	↑	15
Western Europe, Middle East & Africa	↘	17
North and Central Europe	↑	17
Latin America	↗	8
Business Area Solutions	→	**100**

↑ > 5 percentage points ↗ 1 to 5 percentage points → 1 to –1 percentage points ↘ –1 to –5 percentage points ↓ < –5 percentage points

Results of operations, financial position and net assets

Results of operations

In fiscal year 2019, the figure for EBITDA before restructuring measures was EUR 479.2 million, around 11 percent below the prior-year figure as expected (adjusted for effects of EUR 67.3 million from the initial application of IFRS 16 "Leases"). As such, the corresponding margin of 9.8 percent was a good 130 basis points below the value of the previous year. Whereas 2018 saw a non-recurring contribution of EUR 23 million to earnings, special factors totaling around EUR 41 million conspired to impact earnings in the year under review. In addition, currency effects led to an improvement of EUR 14.4 million in the year under review (previous year: deterioration of EUR 0.3 million).

The figure for EBITDA in the reporting period includes restructuring expenses of EUR 104.9 million. Significant restructuring measures affected both the Business Area Solutions and the new organizational structure, which was rolled out in stages starting October 1, 2019, and entered into force in its entirety on January 1, 2020. Primarily due to an impairment of EUR 247.6 million recognized on the goodwill of the Italian subsidiary Pavan S.p.A. acquired in November 2017, the restructuring expenses included in EBIT amounted to EUR 380.5 million (see page 258 f.).

In fiscal year 2019, cost of sales increased by EUR 56.8 million to EUR 3,478.5 million. Compared with the increase in revenues, this constitutes a slightly disproportionate increase. Gross margin fell slightly by around 40 basis points to 28.7 percent. 2019 also saw selling expenses increase disproportionately to revenue with a rise of EUR 58.7 million to EUR 615.3 million (12.6 percent of revenue compared with 11.5 percent of revenue a year earlier). Both Business Areas contributed to the increase in both cost of sales and selling expenses. Compared to the previous year, personnel expenses increased by EUR 137.6 million to EUR 1,517.5 million.

Business Area Equipment

In the 2019 financial year, the Business Area Equipment generated EBITDA before restructuring measures of EUR 387.2 million, failing by 7.1 percent to match the prior-year figure (EUR 416.9 million). The risk provision set aside for litigation and the settlement of a court case conspired to impact earnings in the Business Area Equipment in 2019 to the tune of EUR 22.6 million. A decline in revenue coupled with a weaker margin, especially in the U.S., affected earnings in the Milking & Dairy Farming product group. The Compression product group also had to contend with declining margins. As a consequence, EBITDA before restructuring measures relative to the revenue generated by the Business Area Equipment fell by around 140 basis points to 14.4 percent.

Business Area Solutions

The figure for EBITDA before restructuring measures of the Business Area Solutions declined by EUR 19.7 million year on year to EUR 132.7 million. This was due in particular to higher risk provisioning of EUR 21.3 million, especially for dairy processing projects. However, the higher share of service business in total revenues had a positive effect on earnings in this Business Area. Correspondingly, the margin fell by around 85 basis points to 5.4 percent.

Other

In the previous year, the figure carried under Other included a non-recurring contribution to earnings of EUR 24.0 million on the basis of recent findings concerning predictions of future cash outflows for commitments stemming from environmental protection and mining.

The following table shows EBITDA before restructuring measures and the corresponding margin per business area:

EBITDA before restructuring measures/EBITDA margin before restructuring measures (EUR million)	2019	2018*	Change in %
BA Equipment	387.2	416.9	–7.1
as % of revenue	14.4	15.9	–
BA Solutions	132.7	152.4	–12.9
as % of revenue	5.4	6.2	–
Others	–43.6	–22.5	–93.5
Consolidation	2.9	–7.8	–
GEA	**479.2**	**539.1**	**–11.1**
as % of revenue	**9.8**	**11.2**	**–**

*) Pro-forma figures for 2018 incl. IFRS 16 effects from 2019.

The table below shows the reconciliation of EBITDA before restructuring measures through EBITDA and EBIT to EBIT before restructuring measures:

Reconciliation of EBITDA before restructuring measures to EBIT before restructuring measures (EUR million)	2019	2018	Change in %
EBITDA before restructuring measures[1]	**479.2**	**539.1**	**–11.1**
Restructuring measures	–104.9	–40.6	–
IFRS 16 effect	–	–67.3	–
EBITDA (IFRS)	**374.4**	**431.2**	**–13.2**
Depreciation of impairment losses on property, plant, and equipment, and investment property, and amortization of and impairment losses on intangible assets and goodwill, as reported in the statement of changes in non-current assets	–483.3	–170.6	–
Other impairment losses and reversals of impairment losses	–0.1	–0.8	–
EBIT (IFRS)	**–109.1**	**259.8**	**–**
Restructuring measures[2]	380.5	47.0	–
IFRS 16 effect	–	2.3	–
EBIT before restructuring measures[1]	**271.4**	**309.1**	**–**

1) Pro-forma figures for 2018 incl. IFRS 16 effects from 2019.
2) 2019 including impairment Goodwill Pavan of 247,6 EUR million.

EBIT before restructuring measures and the corresponding margin per business area appear in the following table:

EBIT before restructuring measures/EBIT margin before restructuring measures (EUR million)	2019	2018*	Change in %
BA Equipment	271.0	275.4	–1.6
as % of revenue	10.1	10.5	–
BA Solutions	62.0	78.4	–20.9
as % of revenue	2.5	3.2	–
Others	–64.6	–37.1	–74.0
Consolidation	3.0	–7.6	–
GEA	**271.4**	**309.1**	**–12.2**
as % of revenue	**5.6**	**6.4**	**–**

*) Pro-forma figures for 2018 incl. IFRS 16 effects from 2019.

The table below shows the key indicators affecting GEA's results of operations:

Key figures: Results of operations (EUR million)	2019	2018	Change in %
Revenue	4,879.7	4,828.2	1.1
EBITDA before restructuring measures*	479.2	539.1	–11.1
EBITDA (IFRS)	374.4	431.2	–13.2
EBIT before restructuring measures*	271.4	309.1	–12.2
EBIT (IFRS)	–109.1	259.8	–
Interest result	–16.4	–29.1	43.5
EBT (IFRS)	–125.5	230.7	–
Income taxes	61.0	115.5	–47.2
Profit after tax from continuing operations	–186.6	115.2	–
Profit/loss after tax from discontinued operations	15.9	–1.6	–
Profit for the period	–170.7	113.5	–

*) Pro-forma figures for 2018 incl. IFRS 16 effects from 2019.

For the whole of 2019, GEA reported negative EBIT of EUR –109.1 million, primarily due to an impairment on the goodwill of the subsidiary Pavan S.p.A. (EUR 247.6 million). Furthermore, the decline in operating earnings conspired with higher outlays on restructuring measures to produce a reduction in earnings. The EBIT margin amounted to –2.2 percent, after 5.4 percent in the previous year. The EBIT margin adjusted for restructuring expenses was 5.6 percent in the year under review and was approximately 80 basis points below the previous year's figure.

Net interest income amounted to minus EUR 16.4 million in the year under review, compared with minus EUR 29.1 million in fiscal year 2018. The improvement of EUR 12.7 million was mainly due to an adjustment to the method of calculating interest when measuring provisions for long-term liabilities in the areas of environmental protection and mining. The effect of this adjustment amounted to EUR 11.5 million (see page 224 f.).

The income tax expense of EUR 61.0 million in fiscal year 2019 (previous year: EUR 115.5 million) comprised current tax expenses of EUR 82.3 million (previous year: EUR 64.2 million) and deferred tax income of EUR 21.3 million (previous year: EUR 51.3 million in deferred tax expense). The tax rate amounted to –48.6 percent in the reporting year (previous year: 50.1 percent). Adjusted for the non-tax-deductible effect of the impairment on the goodwill of Pavan, which severely impacted GEA's earnings in fiscal year 2019, the tax rate stood at 50.0 percent. The divergence with the expected tax rate of 30.0 percent mainly resulted from non-tax-deductible expenses, taxes from prior periods, and withholding tax and other foreign income tax expenses.

In the 2019 financial year, earnings from discontinued operations were well into the black at EUR 15.9 million. EUR 21.2 million (before income taxes) of this total was attributable to the above-mentioned adjustment to the method of interest calculation. This was offset by a tax effect of EUR 4.7 million. Other contributions to earnings came from the reversal of a tax provision in connection with the sale of the GEA Heat Exchangers segment and from a rebate from the Dörries Scharmann AG insolvency proceedings (see page 155). With earnings of EUR –1.6 million, discontinued operations more or less broke even in the previous year.

Consolidated profit for the year amounted to EUR –170.7 million (previous year: EUR 113.5 million), almost all of which was again attributable to GEA Group Aktiengesellschaft shareholders in 2019. Since the average number of shares was unchanged year on year (180,528,462), this corresponds to earnings per share of EUR –0.95 (previous year: EUR 0.63).

In addition to holding company costs in the narrower sense, the results of operations of GEA Group Aktiengesellschaft are primarily driven by net investment income and net interest income. More in-depth information on the earnings situation is provided in the section entitled "Net assets, financial position, and results of operations of GEA Group Aktiengesellschaft" (see page 67 ff.).

The Executive Board and Supervisory Board are proposing to pay the same dividend as in the previous year, i.e. EUR 0.85 per share. As such, the target distribution to shareholders of 40 to 50 percent of group earnings, valid since 2014, remains unchanged.

Financial position

GEA remains in a very strong financial position. However, the management of liquidity and centralized financial management remain key given market volatility.

GEA's cash credit lines and their utilization at the reporting date:

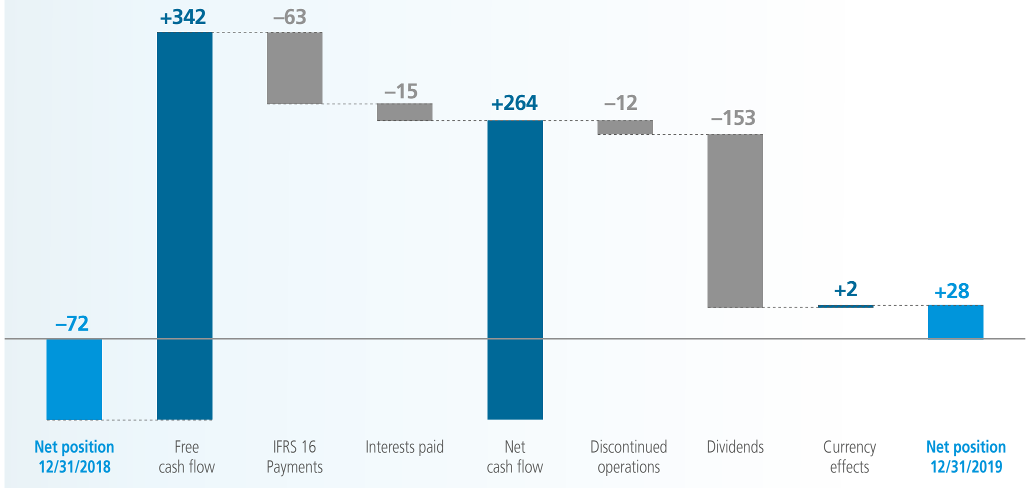
GEA cash credit lines incl. discontinued operations (EUR million)	Maturity	12/31/2019 approved	12/31/2019 utilized
Borrower's note loan (2023)	February 2023	128	128
Borrower's note loan (2025)	February 2025	122	122
European Investment Bank	December 2025	150	50
Bilateral credit lines	until further notice	84	24
Syndicated credit line ("Club Deal")	August 2022	650	–
Total		**1,134**	**324**

The group's financial management encompasses liquidity management, group financing, and the management of interest rate and exchange rate risks. As the group management company, GEA Group Aktiengesellschaft is responsible for GEA's central financial management, which aims to reduce financing costs as far as possible, to optimize interest rates for financial investments, to minimize counterparty credit risk, to leverage economies of scale, to hedge interest rate and exchange rate risk exposures as effectively as possible, and to ensure that loan covenants are complied with. The goal of GEA's financing strategy is not only to be able to meet its payment obligations whenever they fall due, but also to ensure that sufficient cash reserves are always available in the form of credit lines, in addition to maintaining a strategic cash position.

Cash flow from operating activities is the most important source of liquidity. Intragroup cash pooling aims to limit external cash investments and borrowings to as low a level as possible. To achieve this, GEA has also established cash pooling groups in 17 countries that automatically balance the accounts of the participating group companies every day by crediting or debiting a target account at GEA Group Aktiengesellschaft. Any additional liquidity requirements are generally borrowed by group management, which also invests surplus liquidity. In a number of cases, however, liquidity peaks in individual countries cannot be reduced on a cross-border basis due to legal or tax-related reasons.

The key factors responsible for the change in net liquidity are shown in the following chart:

Change in net financial position
(EUR million)



On December 31, 2019, net liquidity including discontinued operations amounted to EUR 28.4 million – after net debt of EUR 72.2 million at the end of the previous year. Aside from realized EBITDA, this increase in liquidity is due to the reduction in working capital. The biggest outflows of liquidity are attributable to the dividend payments and to capital expenditure on property, plant and equipment (EUR 153.4 million and EUR 137.0 million respectively).

Overview of net liquidity incl. discontinued operations (EUR million)	12/31/2019	12/31/2018
Cash and cash equivalents	354.6	247.9
Liabilities to banks	326.1	320.1
Net liquidity (+)/Net debt (-)	**28.4**	**–72.2**
Gearing (%)	–1.4	2.9

Cash and cash equivalents stood at EUR 354.6 million as of December 31, 2019, EUR 106.7 million above the figure at the end of the previous year. At the end of the year, total liabilities to banks amounted to EUR 326.1 million, a figure comparable with that at the end of the previous year (EUR 320.1 million).

Further information on the currency- and interest-rate structure of debt financing can be found in the risk report (see page 160 ff.).

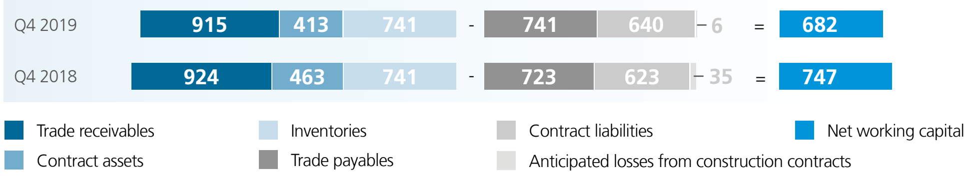
Guarantee lines – which are mainly for contract performance, advance payments, and warranties – of EUR 1,316.4 million (December 31, 2018: EUR 1,321.0 million) were available to GEA as of the reporting date, of which EUR 425.7 million (December 31, 2018: EUR 536.1 million) had been utilized.

GEA uses factoring programs as off-balance-sheet financing instruments.

At the end of the year, purchase commitments amounted to EUR 159.5 million (previous year: EUR 154.4 million) and were largely attributable to inventories.

Change in net working capital (continued operations)

(EUR million)



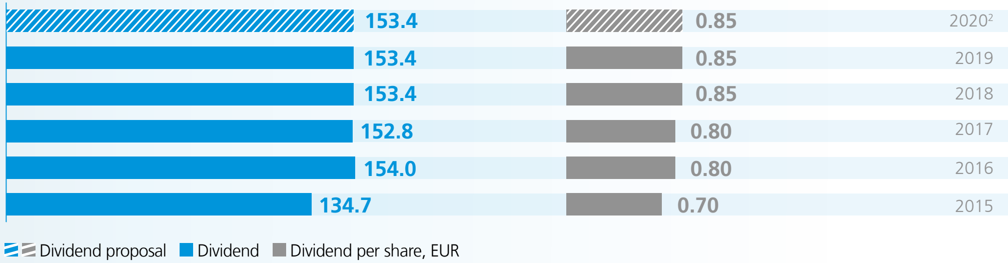
Working capital from continuing operations was cut by EUR 64.9 million compared with the previous year, and this was primarily due to a decrease in contract assets.

The maturity structure of trade receivables from third parties is shown in the table below. Trade receivables with regard to unconsolidated subsidiaries are not stated.

(EUR million)		12/31/2019	12/31/2018
Carrying amount before impairment losses		**968.8**	**962.2**
Impairment losses		70.0	64.8
Carrying amount		**898.8**	**897.4**
of which not overdue at the reporting date		616.8	619.2
of which past due at the reporting date		282.0	278.2
	less than 30 days	133.7	126.2
	between 31 and 60 days	49.6	53.3
	between 61 and 90 days	26.8	27.2
	between 91 and 180 days	32.0	27.0
	between 181 and 360 days	21.0	20.4
	more than 360 days	18.9	24.0

GEA Group Aktiengesellschaft paid an unchanged dividend of EUR 0.85 per share for fiscal year 2019. The dividend volume was the same as in the previous year at EUR 153.4 million.

Dividend payments[1] for the last 5 years and dividend proposal
(EUR million)



1) Dividend payments respectively for the preceding fiscal year
2) On basis of dividend proposal

The consolidated cash flow statement can be summarized as follows:

Overview of cash flow statement (EUR million)	2019	2018	Change absolute
Cash flow from operating activities	483.2	268.0	215.2
Cash flow from investing activities	–141.0	–146.4	5.3
Free cash flow	**342.2**	**121.6**	**220.6**
Cash flow from financing activities	–226.0	–112.9	–113.2
Net cash flow other discontinued operations	–11.9	–6.0	–5.9
Change in unrestricted cash and cash equivalents	106.7	–2.0	108.7

Cash flow from operating activities attributable to continued operations amounted to EUR 483.2 million in the year under review, well above the previous year's value of EUR 268.0 million. Higher provisions and the scaling back of working capital were the main contributing factors here. However, EBITDA exhibited a downward trajectory.

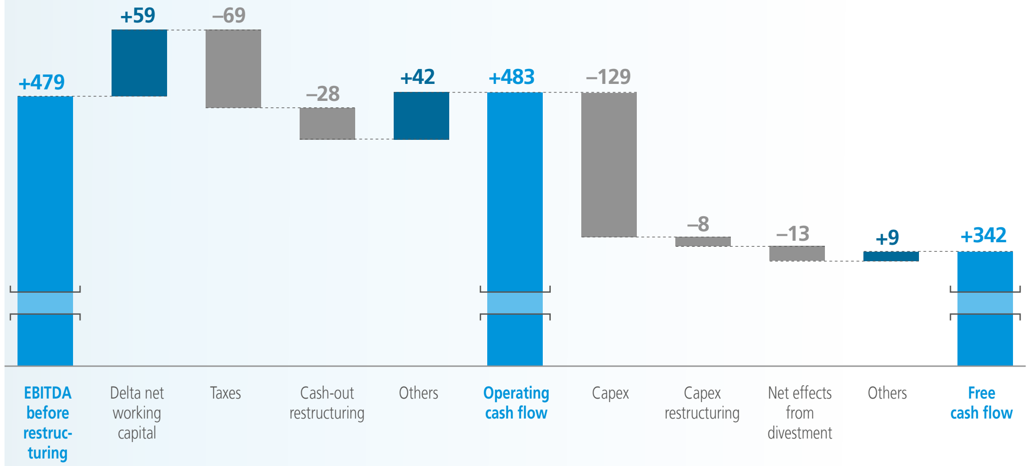
Cash flow from investing activities attributable to continuing operations amounted to EUR –141.0 million in the reporting period – almost on a par with the prior-year level of EUR –146.4 million. In 2019, this item included outflows of EUR 137.0 million (previous year: EUR 132.1 million) for capital expenditure on property, plant, and equipment and intangible assets, and of EUR 12.6 million for company divestments (previous year: EUR 17.4 million outflows for company acquisitions and EUR 15.2 million for company divestments).

Cash flow from financing activities attributable to continued operations reflected the dividend payout of, once again, EUR 153.4 million and, in particular, outflows for lease liabilities (EUR 63.5 million). Proceeds from raising finance loans and outflows from their repayment amounted to a net cash inflow of EUR 5.9 million. A dividend payout was included in this item in the previous year, too. In addition, new borrower's note loans amounting to EUR 250.0 million were taken out in 2018, as well as a EUR 50.0 million loan from the European Investment Bank (EIB).

Cash flow from discontinued operations amounted to EUR –11.9 million in the reporting period (previous year: EUR –6.0 million).

Free cash flow

(EUR million)



Net assets

Condensed balance sheet (EUR million)	12/31/2019	as % of total assets	12/31/2018	as % of total assets	Change in %
Assets					
Non-current assets	3,066.6	53.7	3,115.3	54.5	–1.6
thereof goodwill	1,512.2	26.5	1,755.3	30.7	–13.9
thereof deferred taxes	351.6	6.2	306.1	5.4	14.9
Current assets	2,643.9	46.3	2,603.8	45.5	1.5
thereof cash and cash equivalents	354.6	6.2	247.9	4.3	43.0
thereof assets held for sale	0.2	0.0	3.7	0.1	–95.7
Total assets	**5,710.6**	**100.0**	**5,719.1**	**100.0**	**–0.1**
Equity and liabilities					
Equity	2,090.1	36.6	2,449.4	42.8	–14.7
Non-current liabilities	1,540.8	27.0	1,380.9	24.1	11.6
thereof financial liabilities	424.0	7.4	305.2	5.3	38.9
thereof deferred taxes	104.3	1.8	103.0	1.8	1.2
Current liabilities	2,079.7	36.4	1,888.8	33.0	10.1
thereof financial liabilities	90.0	1.6	28.5	0.5	> 100
Total equity and liabilities	**5,710.6**	**100.0**	**5,719.1**	**100.0**	**–0.1**

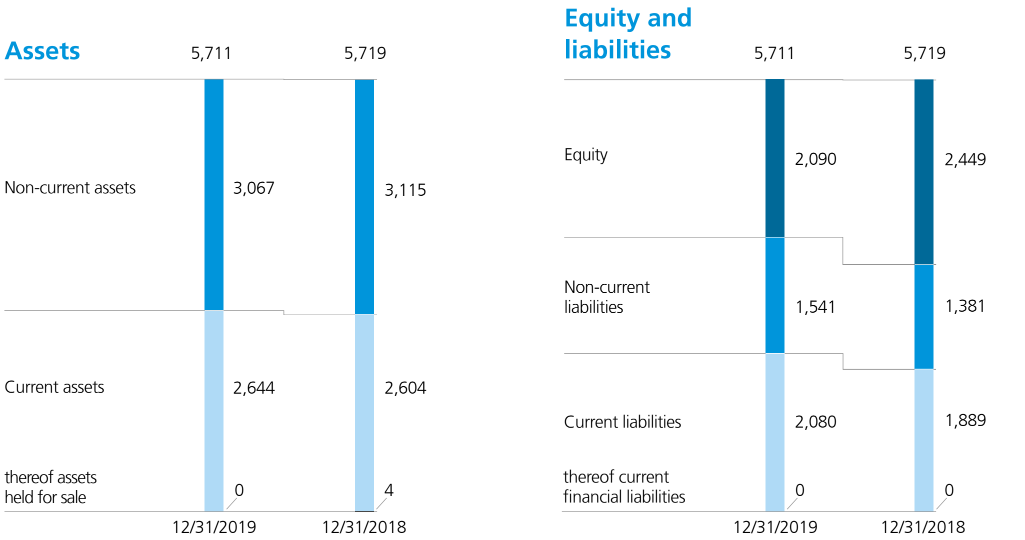
Total assets were virtually unchanged compared with December 31, 2018. Mainly due to the initial application of IFRS 16 „Leases," fixed assets increased markedly in the reporting period. Cash and cash equivalents and deferred tax assets also increased. In contrast, an impairment on the goodwill of the subsidiary Pavan S.p.A. (EUR 247.6 million) and a reduction in trade receivables served to reduce the balance-sheet total.

The significant EUR 359.3 million fall in equity resulted primarily from negative consolidated earnings of EUR –170.6 million and the dividend payout (EUR 153.4 million). Another negative effect on equity was caused by lower interest rates when measuring pension provisions (EUR 58.5 million). On the other hand, this balance sheet item was improved by currency translation effects (EUR 23.6 million). The equity ratio at the end of the fiscal year fell to 36.6 percent, after 42.8 percent at December 31, 2018.

The initial application of IFRS 16 meant that non-current and current lease liabilities grew by EUR 119.1 million and EUR 56.7 million respectively compared with December 31, 2018. Furthermore, pension provisions (due to the cut in the interest rate) and restructuring provisions both increased.

Comparison of net assets (2019 vs. 2018)

(EUR million)



Return on capital employed (ROCE)

ROCE (average of the last 4 quarters)	12/31/2019	12/31/2018	12/31/2018[1]
EBIT before restructuring measures (EUR million)	271.4	306.8	309.1
Capital employed (EUR million)[2]	2,566.4	2,484.3	2,657.2
Return on capital employed (in %)	**10.6**	**12.3**	**11.6**

1) Pro-forma figures for 2018 incl. IFRS 16 effects from 2019.
2) Capital employed excluding goodwill from the acquisition of the former GEA AG by former Metallgesellschaft AG in 1999 (average of the last 4 quarters).

Performance of discontinued operations

Other companies

Once again, other companies classified as discontinued operations did not have an appreciable impact on consolidated profit in fiscal year 2019.

Employees

As of the reporting date, the workforce in continuing operations had dropped by 152 to 18,490 employees compared with December 31, 2018. Including temporary staff and self-employed contractors, the reduction amounted to 540 full-time equivalents. The sale of de Klokslag and a dealer of Farm Technologies in the U.S. reduced the number of employees by 76 and 45 full-time equivalents respectively.

Employees* by region	12/31/2019	in %	12/31/2018	in %
DACH & Eastern Europe	6,861	37.1	6,765	36.3
Western Europe, Middle East & Africa	3,278	17.7	3,434	18.4
North and Central Europe	3,072	16.6	3,056	16.4
Asia Pacific	3,092	16.7	3,049	16.4
North America	1,675	9.1	1,821	9.8
Latin America	512	2.8	518	2.8
Total	**18,490**	**100.0**	**18,642**	**100.0**

*) Full-time equivalents (FTE) excluding vocational trainees and inactive employment contracts

	12/31/2019					
	Employees total		thereof permanent		thereof temporary	
Employees* by employment contract and gender	Number	in %	Number	in %	Number	in %
Men	15,416	83.4	14,753	95.7	664	4.3
Women	3,073	16.6	2,873	93.5	200	6.5
Total	**18,490**	**100.0**	**17,626**	**95.3**	**864**	**4.7**

*) Full-time equivalents (FTE) excluding vocational trainees and inactive employment contracts

Further information on the distribution of employees by gender at the various management levels is presented in the chapter "Sustainability at GEA" (see page 141 f.).

	12/31/2019					
	Employees total		thereof permanent		thereof temporary	
Employees* by employment contract and region	Number	in %	Number	in %	Number	in %
DACH & Eastern Europe	6,861	37.1	6,701	97.7	160	2.3
Western Europe, Middle East & Africa	3,278	17.7	3,252	99.2	25	0.8
North and Central Europe	3,072	16.6	3,006	97.9	66	2.1
Asia Pacific	3,092	16.7	2,479	80.2	613	19.8
North America	1,675	9.1	1,675	100.0	0	0.0
Latin America	512	2.8	512	100.0	0	0.0
Total	**18,490**	**100.0**	**17,626**	**95.3**	**864**	**4.7**

*) Full-time equivalents (FTE) excluding vocational trainees and inactive employment contracts

	12/31/2019					
	Employees total		thereof men		thereof women	
Employees* by employment type and gender	Number	in %	Number	in %	Number	in %
Full-time	17,634	95.4	15,151	85.9	2,483	14.1
Part-time	856	4.6	265	31.0	591	69.0
Total	**18,490**	**100.0**	**15,416**	**83.4**	**3,073**	**16.6**

*) Full-time equivalents (FTE) excluding vocational trainees and inactive employment contracts

Total workforce*	12/31/2019	in %	12/31/2018	in %	Change (absolute)
GEA employees	**18,490**	**92.1**	**18,642**	**90.4**	**–152**
Contingent workers	1,585	7.9	1,972	9.6	–387
thereof temporary staff/agency workers	1,425	89.9	1,824	92.5	–399
thereof self-employed contractors	161	10.1	149	7.5	12
Total	**20,075**	**100.0**	**20,615**	**100.0**	**–540**

*) Full-time equivalents (FTE)

In-depth information on staff issues such as learning and training, management development processes and diversity can be found in the Sustainability Report (see page 136 ff.).

Net Assets, Financial Position, and Results of Operations of GEA Group Aktiengesellschaft

In addition to the reporting by the group, the following section describes the performance of GEA Group Aktiengesellschaft (group management). The annual financial statements are prepared in accordance with the Handelsgesetzbuch (HGB – German Commercial Code) and the Aktiengesetz (AktG – German Stock Corporation Act). They are presented here in condensed form.

GEA Group Aktiengesellschaft oversees central management functions of the group. Furthermore, it provides its subsidiaries especially with services from the Global Corporate Center on the basis of service agreements. Profit and loss transfer agreements exist with key domestic subsidiaries. In turn, the economic position of GEA Group Aktiengesellschaft depends on its subsidiaries' business development, which fundamentally corresponds to the development of GEA; for more information, please see page 75 in the section "Overall Assessment of Business Development."

Net assets of GEA Group Aktiengesellschaft (HGB) (EUR million)	12/31/2019	as % of total assets	12/31/2018	as % of total assets
Assets				
Intangible fixed assets	24.1	0.6	12.8	0.3
Tangible fixed assets	1.5	0.1	1.7	0.1
Long-term financial assets	2,337.4	63.4	2,354.7	59.0
Fixed assets	**2,363.0**	**64.1**	**2,369.2**	**59.4**
Receivables and other assets	1,160.0	31.4	1,561.2	39.2
thereof Receivables from affiliated companies	1,135.7	30.8	1,527.6	38.3
thereof Other assets	24.3	0.6	33.6	0.9
Cash	154.1	4.2	48.5	1.2
Current assets	**1,314.1**	**35.6**	**1,609.7**	**40.4**
Prepaid expenses	**10.6**	**0.3**	**9.4**	**0.2**
Total	**3,687.7**	**100.0**	**3,988.3**	**100.0**
Equity and liabilities				
Subscribed capital	520.4	14.1	520.4	13.0
Capital reserves	250.8	6.8	250.8	6.3
Revenue reserves	479.7	13.0	348.7	8.7
Net retained profits	154.2	4.2	154.2	3.9
Equity	**1,405.1**	**38.1**	**1,274.0**	**31.9**
Provisions	**290.0**	**7.9**	**254.9**	**6.4**
Liabilities to banks	300.0	8.1	300.0	7.5
Verbindlichkeiten aus Lieferungen und Leistungen	29.0	0.8	5.8	0.2
Liabilities to affiliated companies	1,653.8	44.8	2,148.1	53.9
Other liabilities	9.8	0.3	5.5	0.1
Liabilities	**1,992.6**	**54.0**	**2,459.4**	**61.7**
Total	**3,687.7**	**100.0**	**3,988.3**	**100.0**

Total assets of GEA Group Aktiengesellschaft decreased by EUR 300.6 million compared with the prior-year period. The principal reason for this was a reduction of EUR 391.9 million in receivables from affiliated companies and a decline in liabilities to affiliated companies of EUR 494.3 million. The fall in liabilities was due to cash outflows to an indirect holding which the latter then used to repay capital of EUR 246.6 million to a direct subsidiary. Inversely, these funds were then used to repay liabilities owed to GEA Group Aktiengesellschaft, thus leading to a reduction in the latter's receivables. Furthermore, an allowance of EUR 67.9 million was made for receivables from affiliated companies.

Also, higher claims on profit transfer agreements compared with the previous year produced a decline in liabilities to affiliated companies.

The decline in financial assets is primarily due to repayments of EUR 14.5 million in long-term loans and impairments on financial assets of EUR 7.0 million, which were offset to some extent by new loans of EUR 3.5 million.

Offsetting these trends was an increase of EUR 105.6 million in credit with banks.

The amount of equity increased overall by EUR 131.1 million; this item on the balance sheet was bolstered by net income for the fiscal year of EUR 284.5 million and reduced by dividends paid of EUR 153.4 million. The equity ratio increased by around 6 percentage points to 38.1 percent.

Trade payables rose mainly as a result of the purchase of licenses at the end of the business year.

The increase in provisions from EUR 254.9 million to EUR 290.0 million was due to the change in other provisions – a result mainly of an addition of EUR 23.8 million to the provision for negative consequences arising from mining activities. This became necessary on account of an adjustment in the inflation rate from 0.7 percent p.a. to 1.0 percent p.a. and in the interest rate used for discount unwinding costs in connection with non-current provisions.

There were only minor changes overall to the rest of the balance sheet items compared with the previous year.

Income statement of GEA Group Aktiengesellschaft (HGB) (EUR million)	2019	2018
Revenue	167.9	151.4
Other operating income	157.4	162.7
Cost for purchased services	–91.1	–88.2
Personnel expenses	–62.4	–55.5
Amortization amd writedowns of intangible fixed assets and depreciation and writedowns of tangible fixed assets	–75.6	–9.0
Other operating expenses	–223.5	–243.4
Investment income	443.7	138.7
Net interest income	–21.1	–6.4
Write-downs on financial assets and securities held as current assets	–7.0	–10.0
Taxes on income	–3.4	–7.8
Net income after income tax	**284.9**	**32.5**
Other tax expenses	–0.4	–0.5
Net income for the fiscal year	**284.5**	**32.0**
Retained profits brought forward	0.7	1.1
Withdrawals from other revenue resevers	–	121.0
Appropriation to other revenue reserves	–131.0	–
Net retained profits	**154.2**	**154.2**

The revenues of GEA Group Aktiengesellschaft essentially comprised charges of EUR 145.2 million (previous year: EUR 130.0 million) that were allocated to subsidiaries in the 2019 fiscal year and income of EUR 22.5 million (previous year: EUR 21.2 million) from the trademark fee. To this end, services rendered by group companies were initially charged to GEA Group Aktiengesellschaft before being passed on to subsidiaries in the form of intragroup allocations.

Currency translation gains and losses from own hedges and hedges for affiliated companies were reported gross within other operating income and expenses, as in the previous year. Currency translation gains of EUR 117.1 million (previous year: EUR 145.0 million) and currency translation losses of EUR 100.4 million (previous year: EUR 135.2 million) resulted in net exchange rate gains of EUR 16.7 million (previous year: EUR 9.8 million).

In addition to currency translation gains, the other operating income primarily included income from recharging project costs incurred in 2017 and 2018 to group companies totaling EUR 22.2 million (previous year: EUR 0), as well as income from the reversal of provisions totaling EUR 11.8 million (previous year: EUR 12.5 million).

Outlay for purchased services mainly comprised services provided by other group companies – totaling EUR 53.4 million (previous year: EUR 53.1 million) – required in order to execute the functions of the Global Corporate Center. In addition, expenditure for external service providers amounted to EUR 37.3 million (previous year: EUR 35.1 million).

Personnel expenses increased by EUR 6.9 million compared with the previous year. This was due in large part due to an increase in additions to the provision for bonuses of EUR 9.7 million compared with the previous year, and offset by lower personnel expenses for additions to the pension provisions compared with a year earlier. In contrast to the previous year, expenses resulting from the change in the interest rate were carried in net interest income.

In addition to scheduled writedowns on assets of EUR 7.7 million (previous year: EUR 7.8 million), impairments included allowances on receivables from affiliated companies of EUR 67.9 million (previous year: EUR 1.0 million).

In addition to currency translation losses, other operating expenses mainly comprised outlay for expert opinions and consulting, IT expenditure and licenses, expenses for the addition to the provisions for negative consequences from mining, and other third-party services.

The marked improvement in investment income was the result of income from profit and loss transfer agreements totaling EUR 479.7 million (previous year: EUR 190.3 million), EUR 40.5 million (previous year: EUR 64.7 million) in expenses from profit and loss transfer agreements, and income from other equity investments amounting to EUR 4.5 million (previous year: EUR 13.1 million).

The rise in income from profit transfer agreements resulted from a contribution by a subsidiary of interests in affiliated companies at fair value. Writedowns on interests in affiliated companies by certain subsidiaries had the opposite effect. All told, therefore, GEA posted an increase in income from profit transfer agreements of EUR 331.3 million.

Income from profit transfer agreements mainly comprised profits transferred by GEA Mechanical Equipment GmbH, GEA Group Holding GmbH, GEA Refrigeration Germany GmbH, and GEA Bischoff GmbH. Expenses for loss absorption mainly comprised assumed losses from GEA Farm Technologies GmbH, GEA Real Estate GmbH, GEA Diessel GmbH, ZiAG Plant Engineering GmbH, and mg Altersversorgung GmbH.

Net interest income fell by EUR 14.7 million to EUR –21.1 million (previous year: EUR –6.4 million). This resulted primarily from higher interest expenditure in connection with discount unwinding costs on non-current other provisions and pension provisions. These were carried under personnel expenses in previous years and recognized under interest expenses for the first time in 2019.

The impairments on financial assets contained unscheduled writedowns on interests in companies totaling EUR 7.0 million (previous year: EUR 6.9 million). In the previous year, they included unscheduled writedowns on loans to affiliated companies amounting to EUR 3.1 million.

Cash flow of GEA Group Aktiengesellschaft (HGB) (EUR million)	2019	2018
Cash flow from operating activities	283.5	149.7
Cash flow from investing activities	–24.5	–47.5
Cash flow from financing activities	–153.4	–100.9
Liquid funds	154.1	48.5

Cash flow from operating activities amounted to EUR 283.5 million in the year under review, EUR 133.7 million above the figure for the previous year. This increase was largely due to a EUR 252.5 million improvement in net income. This trend was countered by a decline in liabilities to affiliated companies, which overcompensated for the fall in receivables from affiliated companies by some EUR 102.3 million. A further contributing effect was the EUR 35.1 million rise in provisions.

Investments in intangible assets and property, plant and equipment accounted for EUR 18.7 million in the reporting year. In the previous year, cash flow from investing activities was shaped by the intragroup purchase of equity interests at the fair value of EUR 45.7 million.

Compared with the previous year, the cash flow from financing activities disclosed in 2019 included only the previous year's dividend payout of EUR 153.4 million (previous year: EUR 153.4 million). In the previous year, this indicator had included outflows of EUR 22.5 million for the repurchase of treasury shares, and inflows of EUR 75.0 million from modifications to debt financing.

GEA Group Aktiengesellschaft's business development is subject to the same risks and opportunities as the GEA Group (see page 152 ff.). These are presented in the report on risks and opportunities. Additionally, the relationships with subsidiaries may result in negative effects due to statutory and contractual contingent liabilities (in particular finance).

The income of the GEA Group Aktiengesellschaft depends significantly on the development of the investment income of its subsidiaries. Group income serves as the basis for net retained profits and the corresponding dividend payment. Hence, net retained profits (HGB) for the fiscal year is regarded as the most important key performance indicator for GEA Group Aktiengesellschaft. GEA Group Aktiengesellschaft predicted that net retained profits for fiscal year 2019 would be on or around the level of the previous year, taking existing revenue reserves into account. With net retained profits of EUR 154.2 million in 2019, the projected figure was accurate. With regard to fiscal year 2020, GEA Group Aktiengesellschaft is expecting net retained profits to be on a par with the financial year just ended, taking existing revenue reserves into account.

Proposal on the appropriation of profits

GEA Group Aktiengesellschaft's annual financial statements in accordance with the HGB report net income for the fiscal year of EUR 284.5 million. Of this sum, an amount of EUR 131.0 million was deposited into the other revenue reserves. The Executive Board and Supervisory Board will propose to the Annual General Meeting to pay a dividend of EUR 0.85 per dividend-bearing share (180,492,172; previous year: likewise 180,492,172 shares) to shareholders from net retained profits of EUR 154.2 million and to carry forward the remaining net retained profits of EUR 0.8 million to new account.

The dividend will be paid from the contribution account for tax purposes (section 27 of the Körperschaftsteuergesetz (KStG – German Corporate Income Tax Act)) and therefore without deduction of investment income tax and the solidarity surcharge. In the case of shareholders in Germany, the dividend is not subject to current taxation in the year of payment. The general opinion of the German tax authorities (see also the Federal Ministry of Finance (BMF) circular dated January 18, 2016, para. 92) is that the payment of dividends from the contribution account for tax purposes constitutes a repayment of shareholder contributions, which results in a retrospective reduction in the cost of the shares. This can lead to the imposition of higher capital gains taxes if the shares are sold at a later date.

Explanatory information in accordance with sections 289(4), 289a(1), 315(4) and 315a(1) of the HGB

Composition of the subscribed capital and restrictions on rights

As of December 31, 2019, the subscribed capital of GEA Group Aktiengesellschaft was EUR 520,375,765.57 and was composed of 180,492,172 no-par value bearer shares. All the shares are ordinary shares. The rights and obligations arising from these shares are defined in the AktG (AktG – German Stock Corporation Act). This can result in restrictions affecting voting rights. For example, section 71b AktG states that GEA Group Aktiengesellschaft is not entitled to voting rights from its own shares (treasury stock).

The Executive Board is not aware of any contractual restrictions affecting voting rights. Contractual restrictions affecting the transfer of shares arise through the share-based payment program (Share Ownership Guidelines) of the new remuneration system, which has applied since January 1, 2019, to all members of the Executive Board except for Dr. Helmut Schmale and Martine Snels. The members of the Executive Board who are subject to this remuneration system have pledged to acquire a certain volume of shares of the GEA Group Aktiengesellschaft and not to encumber them or sell them until the end of their terms on the Executive Board. Participation in the GEA Performance Share Plan (incentive program for management) requires a personal investment by participants in GEA shares, which are subject to a holding period of three years. Participants who infringe the holding period lose their right to participate in the plan.

Interests in the share capital exceeding 10 percent of the voting rights

During the 2018 financial year, in accordance with sections 33 and 34 of the Wertpapierhandelsgesetz (WpHG – German Securities Trading Act), Massachusetts Financial Services Company, Boston, Massachusetts, USA, reported that its interests in GEA Group Aktiengesellschaft had exceeded 10 percent of the voting rights.

Provisions governing the appointment and dismissal of members of the Executive Board and amendments to the Articles of Association

The members of the Executive Board are appointed and dismissed by the Supervisory Board in accordance with sections 84 and 85 of the AktG in conjunction with section 31 of the Mitbestimmungsgesetz (MitbestG – German Codetermination Act).

Under Article 20(1) of GEA Group Aktiengesellschaft's Articles of Association, amendments to the Articles of Association may – where legally permissible – be adopted by a simple majority of the share capital represented at the vote. Under Article 21 of the Articles of Association, the Supervisory Board may resolve amendments and additions to the Articles of Association that only affect their wording. In other respects, section 179 of the AktG applies to amendments to the Articles of Association.

Powers of the Executive Board to issue and repurchase shares

In accordance with Article 4(3) of the Articles of Association, the Executive Board is authorized, with the approval of the Supervisory Board, to increase the share capital by up to EUR 77 million by issuing new no-par value shares against cash contributions until April 19, 2022 (Authorized Capital I) and, in accordance with Article 5(4) of said Articles, to define a starting date for profit rights in this case that differs from the date stipulated by law. The authorization may be exercised fully or in partial amounts, on one or several occasions.

Shareholders are generally entitled to subscribe to the new shares. The statutory subscription right may also be granted by the new shares being underwritten by one or more banks with the obligation of offering them to the shareholders for subscription (indirect subscription right). The Executive Board is authorized, with the approval of the Supervisory Board, to disapply shareholders' preemptive rights (i) insofar as this is necessary to eliminate fractional amounts, and/or (ii) in order to grant the creditors of convertible or option bonds with option or conversion privileges or obligations issued by GEA Group Aktiengesellschaft or a subordinate group company of the Company a right to subscribe to new shares to the extent to which they would be entitled after exercising the option or conversion rights or after fulfilling conversion obligations.

In accordance with Article 4(4) of the Articles of Association, the Executive Board is authorized, with the approval of the Supervisory Board, to increase the share capital, wholly or in part, by up to EUR 130 million by issuing new no-par value shares against cash and/or non-cash contributions on one or more occasions until April 15, 2020 (Authorized Capital II) and, in accordance with Article 5(4) of said Articles, to define a starting date for profit rights in this case that differs from the date stipulated by law. The statutory subscription right may also be granted by the new shares being underwritten by one or more banks with the obligation of offering them to the shareholders for subscription (indirect subscription right). Furthermore, the Executive Board is authorized, with the approval of the Supervisory Board, to disapply shareholders' preemptive rights in the case of capital increases against noncash contributions for the purpose of business combinations or the acquisition of companies, parts of companies, or equity interests in companies or other assets. The Executive Board is further authorized, with the approval of the Supervisory Board, to disapply shareholders' preemptive rights (i) in order to implement a so-called scrip dividend where the shareholders of GEA Group Aktiengesellschaft are given the option of contributing their dividend entitlement either wholly or partially to the company as a noncash contribution in return for the granting of new shares, (ii) insofar as it is necessary to eliminate fractional amounts, and (iii) in order to grant the creditors of convertible or option bonds with option or conversion privileges or obligations issued by GEA Group Aktiengesellschaft or a subordinate group company of the company a right to subscribe to new shares to the extent to which they would be entitled after exercising the option or conversion rights or after fulfilling conversion obligations. The total proportionate amount of GEA Group Aktiengesellschaft's share capital allocable to shares issued against cash and/or noncash contributions under disapplication of shareholders' preemptive rights must not exceed 10 percent of the company's share capital at the time when the resolution was adopted by the Annual General Meeting. Finally, the Executive Board is authorized, with the approval of the Supervisory Board, to stipulate the further details of the capital increases from Authorized Capital II and the terms and conditions of the share issue.

In accordance with Article 4(5) of the Articles of Association, the Executive Board is authorized, with the approval of the Supervisory Board, to increase the share capital by up to EUR 52 million by issuing new no-par value shares against cash contributions on one or more occasions until April 15, 2020 (Authorized Capital III) and, in accordance with Article 5(4) of the Articles of Association, to define a starting date for profit rights in this case that differs from the date stipulated by law. The statutory subscription right may also be granted by the new shares being underwritten by one or more banks with the obligation of offering them to the shareholders for subscription (indirect subscription right). The Executive Board is authorized, with the approval of the Supervisory Board, to exclude shareholders' subscription rights if the issue price of the new shares is not significantly lower than the stock exchange price for company shares of the same kind at the time of setting the issue price. In line with the modalities of this disapplication of preemptive rights, the shares issued in accordance with section 203(1) and section 186(3) no. 4 AktG may not exceed 10 percent of the share capital of the company either at the time at which this authorization takes effect or at the time at which it is exercised (upper limit). The upper limit of 10 percent shall be reduced by the proportionate amount of the share capital allocable to shares (i) issued during the term of the Authorized Capital III under disapplication of preemptive rights in accordance with section 71(1) no. 8 sentence 5, and section 186(3) sentence 4 AktG or (ii) issued to service convertible or option bonds with option or conversion privileges or obligations issued by GEA Group Aktiengesellschaft or a subordinate group company of the Company, as long as the convertible or option bonds have been issued during the term of the Authorized Capital III under disapplication of preemptive rights in accordance with section 186(3) sentence 4 AktG. The Executive Board is further authorized, with the approval of the Supervisory Board, to disapply shareholders' preemptive rights (i) insofar as it is necessary to eliminate fractional amounts, and (ii) in order to grant the creditors of convertible or option bonds with option or conversion privileges or obligations issued by GEA Group Aktiengesellschaft or a subordinate group company of the Company a right to subscribe to new shares to the extent to which they would be entitled after exercising the option or conversion rights or after fulfilling conversion obligations. Finally, the Executive Board is authorized, with the approval of the Supervisory Board, to stipulate the further details of the capital increases from Authorized Capital III and the terms and conditions of the share issue.

Under a resolution adopted by the Annual General Meeting on April 16, 2015, the share capital was contingently increased by up to EUR 51,903,633.82, comprising up to 19,200,000 bearer shares (Article 4(6) of the Articles of Association, Contingent Capital 2015). The contingent capital increase will be implemented only to the extent that the holders of conversion or option privileges from convertible bonds or option bonds, profit participation rights or profit participating bonds or a combination of these instruments issued against cash contributions by GEA Group Aktiengesellschaft or a subordinate group company of the company on the basis of the authorization by the Annual General Meeting resolution dated April 16, 2015, exercise their conversion or option privileges, or, if they are obliged to convert or exercise options, satisfy their obligation to convert or exercise options, and if no cash settlement is granted or own shares or shares of another listed company are used in settlement. New shares will be issued at the conversion or option price to be determined in each case in accordance with the authorizing resolution referred to above. The new shares bear dividend rights from the beginning of the fiscal year in which they were created as a result of the exercising of conversion or option privileges or the fulfillment of conversion or option obligations. The Executive Board is authorized, with the approval of the Supervisory Board, to determine the further details of the implementation of the contingent capital increase.

Under a resolution adopted by the Annual General Meeting dated April 19, 2018, GEA Group Aktiengesellschaft is authorized to purchase own shares up to a total of 10 percent of the total proportionate amount of share capital in accordance with section 71(1) no. 8 AktG. The authorization is valid until April 18, 2023. The shares may be purchased via the stock exchange or by means of a public purchase offer to all shareholders. The shares may subsequently be used for all purposes allowed by law. With the approval of the Supervisory Board, the shares may also (i) be sold in another manner than through the stock exchange or by means of a public offering addressed to all shareholders, provided that the issue price of the new shares is not significantly lower than the price for GEA Group Aktiengesellschaft shares of the same kind at the time of sale, (ii) be transferred to third parties for the purpose of business combinations or the acquisition of companies, parts of companies, or equity interests in companies or other assets, (iii) be used to service convertible or option bonds, (iv) be used to implement a scrip dividend or (v) be withdrawn. Further details on the resolutions on the share buyback adopted by the Annual General Meeting on April 19, 2018, are available in the invitation to the Annual General Meeting, which was published in the electronic Federal Gazette on March 12, 2018.

Material agreements that take effect in the event of a change of control following a takeover bid

The individual lenders of the syndicated credit line (club deal) amounting to EUR 650 million may refuse new drawdowns in the event of a change of control. The lenders may call in any amounts already drawn down and terminate the respective credit line giving 20 days' notice.

In the event of a change of control and subject to at least 30 days' notice, the lenders of the borrower's note loans in the total amount of EUR 250 million are entitled to request early repayment of their loan receivable, including interest accrued up to the date of the early repayment.

With regard to the loan agreement with the European Investment Bank (EIB) amounting to EUR 150 million, of which EUR 50 million is currently being used, the EIB is entitled to cancel the undisbursed part of the facility and call in the disbursed amount in the event of a change of control. Furthermore, the lender is entitled to request early repayment of the loan, including accrued interest. In this case, the borrower is obliged to repay the amount on the date specified by the Bank, which may not be earlier than 20 days after the repayment request.

Under a cash management credit line and master loan agreement totaling EUR 300 million, which is primarily used to issue guarantees for subsidiaries, the lender has the right in the event of an imminent change of control to negotiate the continuation of the agreement under changed terms. If no agreement is reached, the loan agreements fall due with immediate effect. In this case, the lender must be released from its obligations under guarantees furnished within two months or, at the discretion of the borrower, the latter shall make a cash deposit in the amount of the outstanding obligations under the guarantees furnished and any credit drawdowns settled.

If there is a change in company control, all the Performance Shares under the GEA Performance Share Program (incentive program for management) expire. Managers who have participated in the plan then receive a compensation payment for the expired Performance Shares. This payment corresponds to the allocated target value in each case. A change of control within the meaning of these agreements and the GEA Performance Share Plan is deemed to have occurred in particular if a majority of voting rights or shares of the company are transferred to a single person or group of persons.

Compensation arrangements with members of the Executive Board or employees

Executive Board members' contracts include provisions on the calculation of bonuses in the event of a change of control. Under the new remuneration system that has applied since January 1, 2019, to all members of the Executive Board except for Dr. Helmut Schmale and Martine Snels, there are no termination rights or other rights in the event of a change of control (change-of-control provision). Additional details can be found in the remuneration report starting on page 84. Further compensation arrangements with employees have been agreed with regard to the Performance Shares under the incentive program for management, the GEA Performance Share Program.

Key attributes of the internal control and risk management system relating to the financial reporting process

See the "Risk Management System" and "Internal Control System" sections starting on pages 152 ff. of the management report.

Overall Assessment of Business Development

Due to the measures introduced in 2019, the data for both order intake and revenue were gratifying for the year as a whole considering the general economic setting and the group's original expectations for 2019. In terms of earnings, GEA managed to absorb unexpected negative impacts and still achieve an EBITDA before restructuring measures at the upper end of the projected corridor. After initiating a special program, GEA made significant progress in its efforts to scale back the key indicator of working capital, cutting the figure for the previous year by about EUR 65 million.

At over EUR 4.9 billion, order intake constituted another record for GEA since the sale its former heat exchanger segment. The increase was attributable mainly to the Business Area Equipment. Whereas the second quarter was relatively weak due to customers' having elected to defer mid- and large-scale orders, the volume of new orders on GEA's books grew significantly in the first and fourth quarters especially.

At almost EUR 4.9 billion, revenue also hit new heights for the group in its present structure. Although a moderate fall had initially been predicted for 2019, revenue had actually risen slightly by the end of the year in question. Service business reported above-average growth in the year under review.

EBITDA before restructuring measures stood at around EUR 479 million. When comparing this figure with the prior-year amount, it should be taken into account that it was negatively impacted by the net effect of a number of non-recurring factors, including currency translation effects, in the double-digit million euro range. That EBITDA before restructuring measures reached the level disclosed is evidence that the restructuring measures introduced in the course of the year had the desired effect of stabilizing the group. This applies particularly to the Business Area Solutions.

Nevertheless, for 2019 as a whole, GEA did report negative EBIT of around EUR –109.1 million. The decline in operating earnings, the impairment on the goodwill of the subsidiary Pavan S.p.A., and higher outlays on restructuring measures all played a significant role in this effect.

Despite negative consolidated earnings, the company's proven operational strength has prompted the Supervisory Board and Executive Board to propose that the Annual General Meeting approve the payout of an unchanged dividend of EUR 0.85 per share for fiscal year 2019. The declared target range for the dividend payout of between 40 and 50 percent of consolidated earnings applies as before.

In summary, it should be noted that the 2019 predictions for revenue and ROCE published in the 2018 Annual Report were actually exceeded, while EBITDA before restructuring measures – despite various negative non-recurring effects – still occupied the upper end of the predicted corridor. Various non-cash impairments and advance restructuring expenses meant that consolidated earnings in 2019 were negative; this does not, however, have any bearing on the proposed dividend payout.

Corporate Governance Report including Corporate Governance Statement

The content of the Corporate Governance Report is not subject of the audit and, pursuant to section 317 para. 2 sentence 6 HGB of the German Commercial Code (HGB), the audit of the disclosures to be made in the corporate governance declaration in accordance with sections 289f para. 2 and 5, 315d of the German Commercial Code (HGB) must be limited to checking whether they have been made.

Transparent, responsible corporate governance and control geared towards long-term value enhancement are given high priority by GEA Group Aktiengesellschaft. In doing so, we align our actions with the generally accepted principles of corporate governance while implementing the suggestions and recommendations of the German Corporate Governance Code as amended on February 7, 2017 (published in the Federal Gazette on April 24, 2017) to the greatest possible extent.

Declaration of Conformity

GEA Group Aktiengesellschaft complies with the recommendations of the German Corporate Governance Code as amended on February 7, 2017 ("GCGC"), and published by the Federal Ministry of Justice in the official section of the Federal Gazette, with the exception of the following deviations, all of which relate to the remuneration of the Executive Board members; with these exceptions, the company will continue to comply with the above recommendations until December 31, 2019. From January 1, 2020, GEA Group Aktiengesellschaft will fully comply with the recommendations of the GCGC.

Since January 1, 2019, GEA has applied a new remuneration system for the members of the Executive Board (**"New Remuneration System"**). Three of the currently four Executive Board members are compensated in accordance with the New Remuneration System, while the Executive Board service agreement concluded with Martine Snels, who will leave the company at the end of the fiscal year, is still based on the Executive Board remuneration system approved by the Annual General Meeting in April 2012 (**"Old Remuneration System"**).

As regards the Old Remuneration System, the Company discloses the following areas of non-compliance with the GCGC that will apply until and including December 31, 2019:

- The company fails to comply with the recommendation set forth in section 4.2.3 para. 2 sentence 3 GCGC, according to which variable remuneration components generally have a multiple-year assessment basis that shall have essentially forward-looking characteristics.

  The multi-year variable remuneration granted to the members of the Executive Board under the Old Remuneration System comprises two components that are weighted and account for 20 and/or 40 percent of their total variable remuneration. The assessment basis underlying the 40 percent component of the multi-year variable remuneration embraces the current as well as the two previous fiscal years ("Multi-year Component") and is, thus, not forward-looking. As a consequence, taken as whole, the assessment bases governing multi-year variable remuneration do not have essentially forward-looking characteristics.
- The recommendation under section 4.2.3 para. 2 sentence 8 GCGC, according to which subsequent amendments to the performance targets or comparison parameters shall be excluded, is not complied with.

In the first quarter of 2019, the Supervisory Board defined the financial key performance indicators under the New Remuneration System for the 2019 fiscal year on the basis of the budget drawn up for this fiscal year. In the process, the equally required alignment of the financial key performance indicators under the multi-year component of the Old Remuneration System for the 2019 fiscal year that still applied to Martine Snels was inadvertently omitted; this omission was remedied by the Supervisory Board in December 2019 with effect for fiscal year 2019.

Between November 15, 2018, and December 18, 2019, GEA Group Aktiengesellschaft complied with the recommendations of the GCGC with the aforementioned exception regarding the recommendation set forth in section 4.2.3 para. 2 sentence 3. As also explained above, in the fiscal year 2019, GEA Group Aktiengesellschaft equally deviated from the recommendation under section 4.2.3 para. 2 sentence 8 GCGC.

Furthermore, from November 15, 2018, until and including December 31, 2018, GEA Group Aktiengesellschaft also deviated from the recommendation under section 4.2.3 para. 2 sentence 2 GCGC, according to which monetary compensation should comprise fixed and variable components.

- Stefan Klebert was appointed to the Executive Board as of November 15, 2018. The New Remuneration System underlying his Executive Board service agreement did not come into effect until fiscal year 2019. For the transition period from November 15, 2018, to December 31, 2018, a target achievement level of 100 percent was assumed for the variable remuneration awarded to Stefan Klebert, which was equivalent to an exclusively fixed remuneration for the corresponding period. Agreeing on targets for such a brief period of time following his initial appointment was considered to be unreasonable by the Supervisory Board.

Düsseldorf, December 19, 2019

For the Supervisory Board	For the Executive Board	
Dr. Helmut Perlet	Stefan Klebert	Marcus A. Ketter

Code of Conduct

The Code of Conduct of GEA Group Aktiengesellschaft stipulates that the group's business activities are to comply with all existing laws and high ethical standards. This Code of Conduct applies to all GEA employees and bodies worldwide. It is supplemented by policies and guidelines on individual topics, in particular anti-corruption, anti-trust and competition law as well as conflicts of interest. This Code of Conduct is supplemented by a Code of Conduct for Suppliers and Subcontractors that obliges these groups to comply with a set of key principles regarding their responsibility towards society, the environment as well as the individuals involved in the production of goods and/or the rendering of services. In addition, there is a Code of Corporate Responsibility jointly agreed between the company and the European Works Council that lays down ethical, social and legal standards binding on all GEA employees. The Code of Conduct and the Code of Corporate Responsibility constitute a globally applicable and uniform policy governing the areas of Quality, Health, Safety & Environment ("QHSE"). The Code of Conduct, the Code of Corporate Responsibility, the QHSE policy as well as further information are published on GEA's website under Investors/Corporate Governance. For further information see page 147 f. of this Annual Report.

Compliance

Compliance in terms of measures designed to ensure adherence to the law as well as internal corporate policies, and the group companies' compliance therewith, are considered to be a key management and supervisory task at GEA. Group-wide compliance activities focus on the prevention of corruption and money-laundering, conflicts of interest, antitrust law as well as data protection. The Chief Compliance Officer coordinates and ensures the implementation of compliance measures, in particular in the aforementioned areas. In this capacity, he/she reports to both the Executive Board and the Audit Committee of the Supervisory Board. Moreover, the compliance organization is involved in processing any and all compliance incidents carrying the risk of criminal proceedings or a fine. The Chief Compliance Officer is assisted by the extended legal compliance organization and the internal audit department. Central legal compliance activities are pooled and handled by the "Compliance & Principle Legal Matters" unit that forms part of the group's corporate legal department. Apart from that, the Business Area Compliance Officers (referred to as Division Compliance Officers from 2020 onwards), who are also members of corporate legal, support the compliance activities undertaken at operational business level. Each operating entity is assigned a Local Compliance Manager (plus an extra Local Compliance Officer from 2020 onwards, if required). In addition, further functions for the purpose of counselling and supporting the Chief Compliance Officer are involved, if need be. GEA's Compliance Management System was reviewed in accordance with the IDW PS 980 auditing standard by the auditing company KPMG with regard to the appropriateness and implementation of the company's anti-corruption and anti-trust policies. The audit was completed without any objections being raised in January 2020.

Parallel to the compliance organization described above, GEA has a worldwide operational export control organization. Key export control activities fall within the remit of the Business Area Export Control Managers. Furthermore, each operating entity is assigned a local Export Control Manager. Finally, a Quality, Health, Safety & Environmental (QHSE) organization is in place to develop and implement group-wide policies, programs and procedures in this specific field.

The members of the compliance organization meet at regular intervals to discuss the latest developments and the potential impact of and/or need to supplement GEA's compliance program. Since December 1, 2014, GEA has in place the so-called Integrity System that was implemented on a global level. This Integrity System allows GEA employees and independent third parties to report suspected compliance infringements or violations of GEA's Codes of Conduct – the general principles of social responsibility – via an internet-based system. To the extent permitted by law, the individuals reporting a violation may remain anonymous, as the case may be. This anonymity is guaranteed by the technical set-up of the Integrity System. The compliance organization rigorously investigates all suspected cases, if necessary by involving group internal audit. Moreover, the group employees relevant for compliance regularly receive face-to-face and web-based training covering current issues and regulations relative to the law, the Code of Conduct and GEA's additional compliance policies and guidelines. GEA's compliance program is rounded off by a close cooperation between the compliance organization and the group's internal audit department as well as on-site talks between representatives of the compliance organization and local managers for evaluating best practices within the group.

Responsible risk management

Sustainable growth can only be achieved if both the opportunities and the risks associated with corporate activities are identified and adequately taken into account. For this reason, an effective control and risk management system represents one of the core elements of corporate governance at GEA. For further details see page 152 ff. of this Annual Report.

Accounting and audit transparency

GEA Group Aktiengesellschaft is committed to transparent reporting. The company's consolidated financial statements and half-yearly financial reports are prepared in accordance with the International Financial Reporting Standards (IFRS) as applicable in the European Union. The single entity financial statements of GEA Group Aktiengesellschaft, which are legally required and determine dividend payout, are governed by the German Handelsgesetzbuch (HGB – German Commercial Code). The Supervisory Board engages the external auditor elected by the shareholders at the Annual General Meeting. The Audit Committee gives particular attention to the oversight of the accounting process, the effectiveness of the internal control, risk management and internal audit systems, the audit of the annual financial statements (in this context, notably the selection and independence of the auditor and the additional services provided by the auditor, audit engagement, the determination of key audit areas as well as the audit fee) as well as compliance. While also taking into account the EU audit reform, it ensures that the auditor's work is not compromised by any conflicts of interest and that the auditor immediately reports any and all findings and events relevant to the Supervisory Board's discharge of duties that have come to the attention of the auditor while performing the audit. Apart from the consolidated and annual financial statements, the Audit Committee also discusses the half-yearly financial and quarterly statements with the Executive Board.

Detailed reporting

GEA Group Aktiengesellschaft communicates openly, actively and extensively. It regularly and promptly informs shareholders, shareholders' associations, analysts, and interested members of the public on equal terms about the company's situation as well as any material changes to its business. In this respect, the company's website constitutes an important means of communication. It contains the annual and half-yearly reports as well as quarterly statements, press releases and other notifications required under the EU Market Abuse Regulation (MAR) and the Wertpapierhandelsgesetz (German Securities Trading Act), the financial calendar and other relevant information. Moreover, analyst meetings, press conferences and events for investors are hosted regularly. The presentations delivered on these occasions are also available on our website under "Investors."

Transactions and shareholdings held by members of governing bodies

Under section 19 MAR, Executive Board and Supervisory Board members or persons closely associated with them are obliged to disclose reportable transactions in shares of GEA Group Aktiengesellschaft or related financial instruments if the transactions concluded in one calendar year reach or exceed the threshold of EUR 5,000 in fiscal year 2019 (new threshold as of January 1, 2020: EUR 20,000). The two transactions reported to the company in fiscal year 2019 were duly disclosed and published on the company's website. The total number of shares in GEA Group Aktiengesellschaft held by all Executive Board and Supervisory Board members amounts to less than 1 percent of the shares issued by the company.

Securities-based remuneration scheme for company executives

With effect from July 1, 2006, GEA Group Aktiengesellschaft launched a long-term, share price- based remuneration scheme called "GEA Performance Share Plan" for certain managers below Executive Board level that expired in fiscal year 2019. Details are provided in note 6.3.3 (see page 232 ff.) to the consolidated financial statements. Currently, there is no successor program replacing this scheme.

Corporate governance and control: Executive Board and Supervisory Board

GEA Group Aktiengesellschaft is subject to the German Stock Corporation Act and, therefore, has a two-tier board structure comprising the Executive Board and the Supervisory Board. The Executive Board constitutes the group's management body. The Supervisory Board – which is composed of twelve members, half of whom are shareholder representatives, while the other half are employee representatives – appoints and advises the Executive Board while overseeing its work. The Executive Board and the Supervisory Board cooperate closely for the benefit of the company, their common goal being the sustainable increase in shareholder value.

Executive Board

The Executive Board holds overall responsibility for the management of the company in accordance with statutory requirements, the Articles of Association as well as the rules of procedure and the corporate policies that are in place. In line with the Rules of Procedure of the Executive Board, each Executive Board member has overall responsibility for and independently manages the area of responsibility assigned to him/her under the schedule of responsibilities while keeping the entire Executive Board consistently informed of all essential business affairs. Decisions on matters of fundamental importance or particular magnitude must be taken by the entire Executive Board. Executive Board resolutions are adopted at regular meetings or, should no member of the Executive Board raise any objections, in writing, orally (also via telephone), via telefax or by referring to other common means of communication such as emails. Each member of the Executive Board must immediately disclose conflicts of interests to the Supervisory Board and inform the other members of the Executive Board, accordingly.

The Executive Board reports to the Supervisory Board regularly, promptly and comprehensively on all issues relating to strategy, planning, business progress, risk exposure, the risk management system as well as compliance that are relevant to the company. Should important issues or business matters that may considerably impact on the situation of the company arise, the Executive Board will notify the Chairman of the Supervisory Board without undue delay. The Articles of Association and the rules of procedure specify key transactions that require the Supervisory Board's approval. Further information on the individual members of the Executive Board can be found on pages 24 as well as 284 of this Annual Report.

Supervisory Board

The Supervisory Board advises the Executive Board on the management of the company and oversees its conduct of the company's business. Between the Supervisory Board meetings, the Chairman of the Supervisory Board maintains regular contact with the Executive Board, in particular the CEO, with whom he discusses matters of strategy, planning, business progress, risk exposure, risk management and corporate compliance. The Supervisory Board usually holds 6 meetings per calendar year that are attended by the members of the Executive Board unless the Chairman of the Supervisory Board determines otherwise. As a rule, the Supervisory Board's resolutions are adopted at these meetings. Unless the majority of the Supervisory Board members immediately object, the Chairman of the Supervisory Board may also determine that resolutions be adopted during a conference call or a video conference or outside of meetings by the members casting their votes in writing, text form or by telephone. Resolutions require a simple majority of the votes cast unless statutory law provides for a different majority. After the notice of the meeting has been given to all members, the Supervisory Board has a quorum when a minimum of half of its members vote on a resolution by attending in person, by telephone or video conference or have cast their votes in writing or text form pursuant to section 108 para. 3 Aktiengesetz (AktG – German Stock Corporation Act).

Supervisory Board Committees

The work of the Supervisory Board is supported by committees. These are primarily the Presiding Committee and the Audit Committee. In addition, there is the statutory Mediation Committee as well as the Nomination Committee recommended by the German Corporate Governance Code. In addition, the Supervisory Board set up a Technology Committee with effect from May 1, 2019, as well as a Special Committee, which was established at the Board meeting on June 19, 2019. Since the Special Committee was not designed as a permanent committee, it was dissolved at the Supervisory Board meeting held on December 19, 2019.

The Audit Committee, the Mediation Committee, the Technology Committee as well as the Special Committee each comprise and/or comprised four members, while the Presiding Committee is composed of 6 members; each of the above committees features and/or featured equal representation of shareholder and employee representatives. The Nomination Committee consists of 3 members, who include exclusively shareholder representatives in accordance with section 5.3.3 of the German Corporate Governance Code.

In each calendar year, the Presiding Committee and the Audit Committee usually meet four and/or five times, respectively. During meetings, Presiding Committee and Audit Committee resolutions are adopted by a simple majority of the votes cast, while they are passed by a simple majority of the members outside of meetings. If the vote is tied, the respective chairman has a casting vote in the event of another ballot on the same subject. The Nomination Committee, the Mediation Committee and the Special Committee only hold and/or held meetings as required.

The Technology Committee usually meets twice a year.

The Presiding Committee focuses on Executive Board matters including succession and remuneration topics, corporate governance as well as specific transactions requiring approval. Moreover, the Presiding Committee is also responsible for jointly deliberating on corporate strategy, capital investments and funding operations together with the Executive Board. In this context, decisions on the Executive Board remuneration system, the total remuneration awarded to the individual Executive Board members, as well as their appointment and dismissal are reserved to the full Supervisory Board.

The Audit Committee, whose chairman has a sound knowledge of and experience in applying financial accounting standards as well as internal control systems, primarily focuses on overseeing the financial accounting process, the efficiency of the internal control and risk management systems, the internal audit process, compliance as well as the audit of the annual financial accounts.

Against the backdrop of GEA's endeavors to develop and/or tap into new and innovative products, processes, markets and business models, the work of the Technology Committee focuses on the assessment of the group's medium- to long-term technology strategy. This also includes digitalization on the basis of the company's business strategy as well as advising the Executive Board and the management on the above topics.

Within the framework of a thematic priority chosen by the Supervisory Board as regards its work in the previous fiscal year, the Special Committee took a closer look at a variety of questions and issues arising in connection with public takeovers; this also included a corresponding full-day skills training workshop for the entire Supervisory Board in summer 2019.

The Mediation Committee performs its duties as set out in sections 27, 31 Mitbestimmungsgesetz (MitbestG – German Co-determination Act). The task of the Nomination Committee is to propose suitable candidates to the Supervisory Board based upon which the latter submits its nominations to the Annual General Meeting.

Further information on the composition of the Supervisory Board and its committees can be found on the company's website at gea.com, as well as on pages 285 and 286 of this Annual Report. In addition, the Report of the Supervisory Board that starts on page 27 of this Annual Report gives further details on the activities performed by the Supervisory Board and its committees in fiscal year 2019. It also discloses individual attendance at meetings held by the Supervisory Board and its committees. In the fiscal year just ended, all Supervisory Board members participated in well over half of the meetings of the Supervisory Board and the committees of which they are members.

Compliance with minimum quotas pursuant to section 96, para. 2 German Stock Corporation Act and commitment to promoting the participation of women in executive positions in accordance with section 76 para. 4 and section 111 para. 5 German Stock Corporation Act

For many years, GEA has encouraged diversity at group level. A description of the diversity strategy is provided in the section on Sustainability at GEA (see page 141 f.). Under its diversity strategy, GEA also pursues the aim of attracting more women to join the company while promoting female talent. In the long run, the company seeks to increase the share of women on all management levels. GEA will continue to support this process by means of strategic measures.

GEA is legally obliged to define targets in relation to the proportion of women represented on the Supervisory Board, the Executive Board and/or the Board of Directors as well as on the two management levels below, and to set target dates for achieving the respective quota of women. Since January 1, 2016, a statutory minimum quota of 30 percent has applied with regard to the underrepresented gender on the supervisory boards of listed and codetermined companies like GEA Group Aktiengesellschaft; this quota has to be observed whenever such companies seek to fill vacant supervisory board positions. Since the 2016 Supervisory Board elections, the Supervisory Board has included 5 female members (previously 4). As a result, the share of women represented on the Supervisory Board of GEA Group Aktiengesellschaft currently amounts to 42 percent.

At its meeting on June 22, 2017, the Supervisory Board of GEA Group Aktiengesellschaft set a new 20 percent target for the proportion of women represented on the Executive Board that will be applicable until December 31, 2021.

In June 2017, the Executive Board of GEA Group Aktiengesellschaft set target quotas for the two management levels below the Executive Board that are to be achieved by December 31, 2021, namely a 25 percent share of women on the first and a 30 percent proportion of women on the second management level.

Targets for the other GEA Group companies affected by this law were also set in due time in relation to the proportion of women represented on the respective Supervisory Board and/or the Board of Directors as well as the two uppermost management levels below the Board of Directors, just like the corresponding deadlines for timely target implementation.

GEA takes the corresponding measures (see page 139 ff.) to ensure that the set targets are accomplished.

Diversity concepts governing the composition of the Executive Board and the Supervisory Board

Together with the Executive Board, the Supervisory Board engages in long-term Executive Board succession planning. The selection process for Executive Board positions is subject to a structured standard procedure. Apart from a balance between technical qualifications and personal skills, the Supervisory Board and its committees also take into account the criterion of diversity when appointing members to the Executive Board. As GEA is an international engineering group and supplier for the food processing industry and various other sectors, appointments to the Executive Board should specifically meet the following additional criteria: International composition, members of at least 2 different nationalities, with the entire body being multilingual, a 20 percent minimum proportion of women as well as an overall balanced age structure. Apart from that, at least half of all Executive Board members should have gained many years of experience in the food sector, while a minimum of 2 Executive Board members should have an engineering or scientific background. As a rule, the members of the Executive Board shall not remain in service beyond the age of 65. However, since the selection of Executive Board members eventually mainly boils down to criteria like professional and personal suitability, while also including other aspects such as candidate availability, this diversity concept did not become fully effective in relation to the appointment of new Executive Board members that started in 2018 and was continued in the 2019 fiscal year.

At its meeting held on December 15, 2017, the Supervisory Board revised the targets for its composition by taking into consideration the recommendations of the German Corporate Governance Code and adding a profile of skills and expertise. Accordingly, the Supervisory Board members shall collectively have the knowledge, skills and professional expertise required to properly perform their duties in consideration of the company-specific situation. This is why, aside from the integrity and commitment of its members, who must have sufficient time to exercise their respective mandate, the Supervisory Board also pays attention to a balanced profile of skills and expertise amongst its members, in particular sufficient industry and sector knowledge relevant to GEA Group Aktiengesellschaft, an adequate number of independent members, international experience as well as diversity. With a view to the interests of the company, the decisive criterion for filling a position on the Board shall in all cases be the professional and individual suitability of the male or female candidate while taking into account the skills and expertise of the other members of the Supervisory Board.

The Supervisory Board seeks to ensure a board composition that takes into consideration the following elements: In terms of the origin, the professional and cultural background as well as the age and gender of its members, the Supervisory Board is to reflect diversity. At least one quarter of the members of the Supervisory Board shall have an international background that ideally covers various regions or cultural areas. Each gender shall account for a minimum of one third of the members of the Supervisory Board. The Supervisory Board shall include – what it considers to be – an adequate number of independent members. For this reason and in consideration of the shareholder structure, the Supervisory Board seeks to ensure that a minimum of two thirds of the shareholder representatives are independent in line with the definition given under section 5.4.2 sentence 2 of the German Corporate Governance Code. At present, all shareholder representatives on the Supervisory Board are independent within the meaning of the German Corporate Governance Code. As a rule, a member's uninterrupted service on the Supervisory Board shall not exceed three full terms of office and/or a period of 15 years. Generally, nominations shall only consider individuals who have not yet reached the age of 70 at the date of the Annual General Meeting resolving on the election of the proposed candidates. If it is foreseeable that individuals would be subject to permanent or repeated conflicts of interest in the event of their election to the Supervisory Board, such individuals shall not be considered as Supervisory Board candidates. Apart from that, the Rules of Procedure of the Supervisory Board provide for detailed rules and regulations governing the handling of conflicts of interests that may occur after a member is elected to the Board. According to these regulations, each Supervisory Board member has the obligation to disclose potential conflicts of interest to the Supervisory Board. Conflicts of interest of a material and non-temporary nature in relation to a Supervisory Board member shall result in the termination of his/her mandate.

The profile of skills and expertise the Supervisory Board seeks to establish for the entire body may be summarized as follows: All members of the Supervisory Board are to be familiar with the sector in which the company operates. At least one Supervisory Board member must have expertise in the fields of financial accounting or auditing. Furthermore, the Chair of the Audit Committee shall also have specific knowledge and expertise in applying internal control procedures. The Supervisory Board shall comprise members with a commercial or business background, individuals from the engineering profession as well as members with experience in one or several of the company's customer industries. A minimum of two Supervisory Board members shall have management experience in operational business. All members of the Supervisory Board shall be able to understand and assess the specific nature of the company's business as well as resulting risks and opportunities. They shall be familiar with the basic principles of accounting and risk management.

In its current composition, the Supervisory Board meets the target composition criteria and lives up to the profile of skills and expertise.

Remuneration Report

The Remuneration Report outlines the key principles applied to determining the total remuneration of the members of the Executive Board of GEA Group Aktiengesellschaft and sets out the structure as well as the level of remuneration for each individual Executive Board member. Furthermore, it specifies the underlying principles and the level of remuneration awarded to the members of the Supervisory Board (see page 114).

The Remuneration Report includes details of the remuneration of board members in line with the requirements stipulated in the German Commercial Code as well as the applicable German and international accounting standards. Since GEA complies with the corresponding recommendations of the German Corporate Governance Code (GCGC) as amended on February 17, 2017, the Remuneration Report also includes the model tables on Executive Board remuneration pursuant to the GCGC (see page 109 ff.).

General information on the remuneration awarded to the members of the Executive Board

Acting on the recommendation of the Presiding Committee, the Supervisory Board determines the total remuneration of the individual Executive Board members and resolves on the remuneration system applicable to the Executive Board. The Supervisory Board reviews the appropriateness of the remuneration at regular intervals. Criteria for determining the appropriateness of the remuneration include the responsibilities of the individual Executive Board members, their respective personal performance, the business situation, the success and the future prospects of the company as well as the common level of compensation taking into account peer companies and the compensation structure in place in other areas of the company.

In fiscal year 2019, GEA applied two Executive Board remuneration systems that existed side by side:

The new remuneration system, which was already described in detail in the 2018 Annual Report took effect on January 1, 2019; in the year under review, it was applicable to Stefan Klebert, Marcus A. Ketter and Steffen Bersch as well as – until his departure – Niels Erik Olsen and will also apply to Johannes Giloth, who joined the company on January 20, 2020 (2019 remuneration system and/or new remuneration system, see page 85 ff.).

The old remuneration system in place since fiscal year 2012 (previous remuneration system, see page 94 ff.), continued to apply to Jürg Oleas, Dr. Helmut Schmale and Martine Snels until their respective departure in the course of and/or at the end of the 2019 fiscal year.

In fiscal year 2020, the remuneration awarded to all Executive Board members will be based on the 2019 remuneration system.

2019 remuneration system

To align the previous remuneration system with changes in regulatory requirements, paying even more attention to investor expectations than in the past, the Supervisory Board conducted a review and comprehensive overhaul of the previous remuneration system. This was done with the assistance of an independent, external remuneration expert in the course of fiscal year 2018, also factoring in suggestions and feedback provided by institutional investors. Compared with the previous remuneration system, the new remuneration scheme in force since January 1, 2019, is more distinctly geared to the performance of the company's share price with a simpler structure due to the number of variable remuneration components being reduced to two. Moreover, it strengthens the position of the Supervisory Board in the event of gross breaches of duty committed by Executive Board members by introducing malus and clawback provisions.

The 2019 remuneration system was approved by a majority of 93.85 percent of the shareholders at the regular Annual General Meeting on April 26, 2019. It is characterized by the following basic principles:

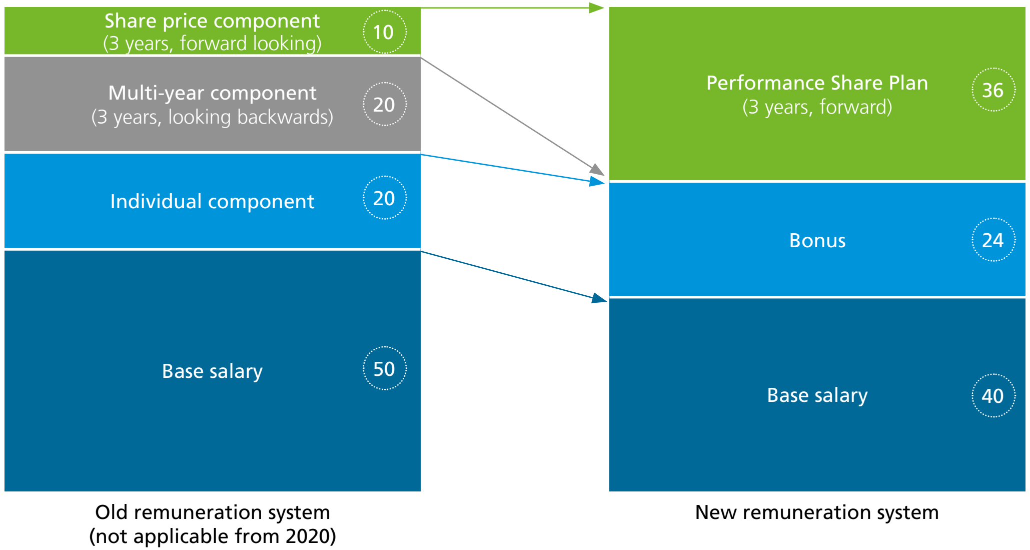
- **Simpler and more comprehensible** given reduced number of remuneration components and performance targets.
- **Clear focus on shares** by more strongly tying the payout of the multi-year variable remuneration to GEA's long-term (share price) performance and by introducing additional share purchase and holding obligations (so-called share ownership guidelines).
- **Focus on performance** by setting performance targets that are even more strongly geared towards financial and sustainable performance.
- **Transparency** by publishing the target ranges and performance target calibrations for the current fiscal year ex ante in the Remuneration Report that covers the preceding fiscal year (see page 89 ff. for the performance targets applicable to the 2020 fiscal year).
- **Regulatory conformity** with the GCGC as amended on February 7, 2017, which was applicable when the new remuneration system took effect. However, the company intends to analyze the new remuneration system in the course of the current fiscal year to check whether there is a need for amendment with regard to the requirements under the new version of the GCGC which is expected to come into force in spring 2020 – and to make the corresponding changes, if necessary.
- **Sanctioning deliberate and gross breaches of duty committed by Executive Board members by means of malus and clawback provisions**, giving the Supervisory Board – for the very first time - the possibility of reducing variable remuneration components for the fiscal year in which the respective breach occurred, down to zero, as the case may be.
- **No contractual provisions in relation to change of control events and a potential special bonus.**

2019 remuneration system – structure and components

The total remuneration awarded to the members of the Executive Board under the 2019 remuneration system comprises one fixed and two variable components (so-called direct remuneration) as well as commitments under the company pension scheme. Moreover, the Executive Board members are granted fringe benefits.

Comparison – remuneration components and weightings

(in %)



Fixed remuneration and fringe benefits

The fixed remuneration accounts for the major proportion of the non-performance-related remuneration of the Executive Board members and consists of a fixed annual salary that is disbursed in twelve equal monthly installments.

In the year under review, the fixed annual salary awarded to Stefan Klebert amounted to EUR 1,200 thousand, Marcus A. Ketter was awarded EUR 680 thousand while Steffen Bersch and Niels Erik Olsen each received EUR 600 thousand. As Marcus A. Ketter joined the company on May 20, 2019, his fixed annual salary was awarded on a pro rata temporis basis. Due to his departure on March 31, 2019, Niels Erik Olsen's fixed annual salary for 2019 was granted pro rata temporis.

In addition, the Executive Board members receive fringe benefits. In the year under review, the latter mainly comprised the value of the use of a company car, accident insurance premiums, and – in individual cases – the reimbursement of costs incurred for travel, accommodation, relocation, subsistence, as well as tax advisory services and legal consultancy.

Pension benefits

Another non-performance-related remuneration component under the new remuneration system is a company pension scheme based on a contribution-oriented defined benefit plan. For a detailed explanation of these pension commitments refer to the section on "Pension commitments" (see page 98 ff.).

Bonus (annual variable remuneration)

Performance targets	EBITDA before restructuring measures ROCE
Weighting	50 percent, respectively
Modifier	Multiplicative link Range of 0.8 to 1.2
Payout	0 to 200 percent of the target value

The members of the Executive Board receive a variable annual performance-related remuneration (bonus) the amount of which is subject to the achievement of two financial performance targets as well as a modifier that is to be determined by the Supervisory Board. Accounting for 40 percent of variable target remuneration and/or 24 percent of total target remuneration, the bonus represents the variable remuneration component that carries less weight than the Performance Share Plan.

In this context, the key indicators weighted at 50 percent, respectively, are earnings before interest, taxes, depreciation and amortization (EBITDA) as well as return on capital employed (ROCE), each adjusted for restructuring measures. At the same time, the short-term performance targets of compensatory relevance are key financial performance indicators and, as such, integral components of the current management system. Please refer to the section "Key financial performance indicators in the 2019 management system" (see page 40 ff.) for definitions of the individual components. Contrary to the definitions of the key financial performance indicators, each of the parameters used for remuneration purposes is adjusted for the effects of transactions that embrace company acquisitions and divestments requiring the approval of the Supervisory Board or its committees. This adjustment is made once in the year a transaction takes place provided that the latter is already included in the budget of the following fiscal year. Otherwise, the effects of the corresponding transaction must also be adjusted in the key figures for the next fiscal year.

As a combination of earnings and return indicator, both key performance indicators support GEA's corporate strategy, which is geared towards profitable and strategic growth. The respective targets are defined by the Supervisory Board at the start of each fiscal year. Subsequently, target achievement is measured on a straight-line basis within the 0 to 200 percent target range.

An additional modifier allows the Supervisory Board to look beyond financial target achievement while also taking into account the individual achievements of the members of the Executive Board as well as the body's collective performance. In this context, assessment is based on pre-defined criteria that may notably include the following aspects:

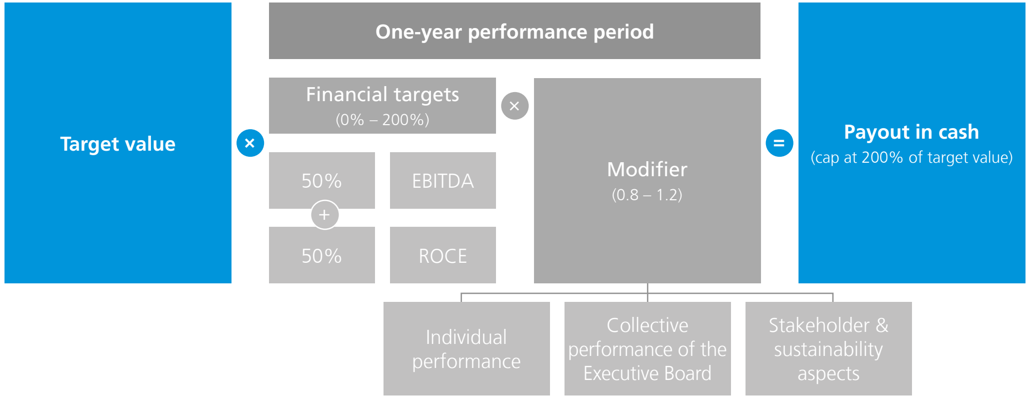
- Individual performance of the respective Executive Board member (e.g., important strategic accomplishments in his/her remit, individual contributions to major cross-departmental projects, relevant financial accomplishments in his/her remit, implementation of key projects)
- Collective performance of the Executive Board (e.g., accomplishment of important strategic corporate goals including mergers & acquisitions, cooperation with the Supervisory Board, long-term strategic, technological or structural development of the company), as well as
- Stakeholder concerns and sustainability aspects (e.g., in the fields of occupational safety and health, compliance, conditions of production, energy and environment, customer satisfaction, concerns of the workforce, corporate culture)

The modifier ranges between 0.8 and 1.2 and may therefore result in an upward or downward adjustment of the bonus awarded to the members of the Executive Board (bonus-malus system).

The overall degree of target achievement in relation to the bonus is calculated as the weighted sum of the EBITDA and ROCE target achievement levels multiplied by the modifier. The resulting amount may be equivalent to 0 percent up to a maximum of 200 percent of the target amount (cap).

The target bonus amounts to EUR 720 thousand for Stefan Klebert, EUR 408 thousand for Marcus A. Ketter as well as EUR 360 thousand for Steffen Bersch and Niels Erik Olsen, respectively. Due to Marcus A. Ketter joining the company on May 20, 2019, his bonus for the 2019 fiscal year was granted on a pro rata temporis basis.

Bonus scheme – how it works



The limited modifier range severely restricts the Supervisory Board's capability to use discretionary intervention for the purpose of impacting the bonus. The catalogue of criteria governing the modifier ensures a strong alignment with performance while providing transparency in the event of a potential adjustment. The new remuneration system does no longer allow the Supervisory Board to grant a special bonus in exceptional circumstances, a possibility that was stipulated in the service agreements concluded under the previous remuneration system.

In the event of extraordinary termination for good cause by the company in accordance with s. 626 para. 1 German Civil Code (BGB – Bürgerliches Gesetzbuch), the bonus is forfeit. In all other cases involving the departure of an Executive Board member during the planned duration of his/her term of office, the respective Board member is entitled to the prorated bonus earned up to the date of his/her departure.

Target achievement and modifier multiplier applicable to the 2019 bonus

In fiscal year 2019, EBITDA before restructuring measures and adjusted for effects from acquisitions totaled EUR 479.8 million, which corresponds to a 114.0 percent target achievement level. ROCE in fiscal year 2019 (also adjusted for restructuring measures and effects from acquisitions) amounted to 10.6 percent, equivalent to a target achievement of 153.2 percent. Overall, this results in a target achievement level of 133.6 percent for the 2019 bonus.

For the purpose of the 2019 bonus, the Supervisory Board has determined a modifier multiplier of 1.18 for Stefan Klebert, a multiplier of 1.18 for Marcus A. Ketter and a 1.13 modifier multiplier for Steffen Bersch. In each case, these multipliers correspond to the average of the individual evaluations of the modifier criteria defined in advance for the members of the Executive Board by the Supervisory Board. The modifier applicable to the 2019 bonus was based on the following targets and assessment criteria:

Modifier targets and assessment criteria applicable to the 2019 bonus (range: 0.8-1.2)		S. Klebert	M. Ketter	S. Bersch
Individual performance	**Strategic performance in individual remit: Pavan** Assessment based on key performance indicators sales and operating EBITDA			•
	Strategic performance in individual remit: Financial transparency Assessment based on the availability date of the relevant financial data		•	
Collective performance of the Executive Board	**Strategic corporate goals (incl. M&A): Stabilization of OneGEA** Assessment based on the results of a targeted employee survey	•	•	•
	Health, Safety & Environment (HSE): Corporate Responsibility/CR Assessment based on the degree of implementation of the CR strategy and certain sustainability performance indicators	•	•	•
Stakeholders and sustainability aspects	**Customer satisfaction: Customer survey** Assessment based on a comparison of the survey results with the results of the previous customer survey	•	•	•
	Employee interests and needs: Employee survey & staff engagement Discretionary assessment including a comparison of the survey results with the results of the previous employee survey	•	•	•

Different arrangements were agreed with Niels Erik Olsen against the backdrop of his departure on March 31, 2019 (see "Agreements governing the departure of former Executive Board members," page 102 ff.).

Calibration of financial performance targets and modifier criteria in relation to the 2020 bonus*

For the purpose of the 2020 bonus, the Supervisory Board has calibrated the following financial performance targets:

For the key performance indicator EBITDA before restructuring measures, 100 percent target achievement is given if the EBITDA before restructuring measures amounts to EUR 470 million in the fiscal year 2020. The target achievement corridor ranges from EUR 370 million, which would correspond to a target achievement of 0 percent, to EUR 570 million, which would correspond to a target achievement of 200 percent. Linear interpolation is performed between these values.

A target achievement of 100 percent should be given for the key performance indicator ROCE in the fiscal year 2020 if ROCE is 10 percent. Here, the target achievement corridor ranges from 8 percent (target achievement would correspond to 0 percent) to 12 percent (target achievement would correspond to 200 percent). Linear interpolation is performed between these values.

*) This section is not part of the independent auditor's audit.

The Supervisory Board has defined the following modifier targets and assessment criteria for the 2020 bonus:

Modifier targets and assessment criteria applicable to the 2020 bonus (range: 0.8-1.2)		S. Klebert	M. Ketter	J. Giloth
Individual performance	**Succession planning** Discretionary assessment by the Supervisory Board taking into account, among other things, criteria for promoting diversity in management positions	•		
	Global production strategy Discretionary assessment by the Supervisory Board			•
	Risk management systems Discretionary assessment by the Supervisory Board, taking into account, among other things, the status of implementation and performance against the current system and processes		•	
Collective performance of the Executive Board	**Stabilization of the CREATE organization** Discretionary assessment by the Supervisory Board	•	•	•
Stakeholders and sustainability aspects	**Customer satisfaction** Largely discretionary assessment by the Supervisory Board	•	•	•
	Employee satisfaction Assessment based on degree of improvement or deterioration, as the case may be	•	•	•

Performance Share Plan (long-term variable remuneration)

Performance targets
Earnings per share (EPS) growth: Relative total shareholder return (TSR) compared with companies under the STOXX® Europe TMI Industrial Engineering index: 25th percentile = 0 percent 50th percentile = 100 percent 75th percentile = 200 percent Ex post publication of actual target achievement in the Remuneration Report

Weighting
50 percent, respectively

Performance period
3 years

Payout
0 percent to 200 percent of target value

The second component of variable remuneration embraces a Performance Share Plan that is forward-looking and covers a three-year period in the future. The performance period of the first tranche of the Performance Share Plan granted for fiscal year 2019 comprises the 2019, 2020 and 2021 fiscal years. The Performance Share Plan places a clear focus on the development of shareholder return. As a consequence, remuneration is strongly aligned with a long-term and sustainable performance of the company as well as the interests of GEA's shareholders. Accounting for a proportion of 60 percent of variable target remuneration and/or 36 percent of total target remuneration, the Performance Share Plan is given more weight than the bonus, the other component of variable remuneration.

At the start of each fiscal year, the members of the Executive Board are granted a certain number of phantom performance shares on a preliminary basis. This number is calculated by dividing the contractual target value of long-term variable remuneration by the fair value of the performance shares at grant date, with the figure being rounded to the nearest whole number. The final number of phantom performance shares is ascertained at the end of the three-year performance period and subject to the achievement of the equally weighted performance targets EPS growth and total shareholder return (TSR) compared with the companies under the STOXX® Europe TMI Industrial Engineering.

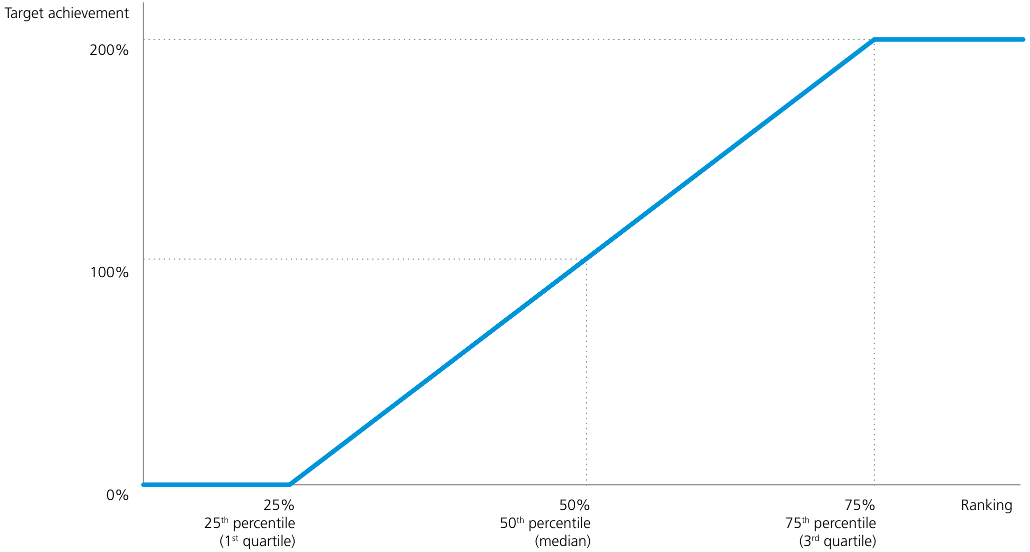
The contractually defined target value under the Performance Share Plan amounts to EUR 1,080 thousand for Stefan Klebert, EUR 612 thousand for Marcus A. Ketter and EUR 540 thousand for Steffen Bersch and Niels Erik Olsen, respectively. Since he joined the company on May 20, 2019, Marcus A. Ketter was granted the target value under the Performance Share Plan for fiscal year 2019 on a pro rata temporis basis.

Performance Share Plan – how it works

EPS growth is computed as compound annual growth rate over the three-year performance period. Like EBITDA and ROCE, EPS is adjusted for restructuring expenses incurred in the fiscal year in question as well as for effects of transactions involving corporate acquisitions and divestments that require the approval of the Supervisory Board or its committees (see "Bonus (annual variable remuneration)," page 87 f.). Target achievement within the 0 to 200 percent target achievement range is measured on a straight-line basis.

Total shareholder return (TSR) refers to share price development plus fictitious reinvestment of gross dividends over the performance period. Thus, TSR measures the level of return generated for GEA shareholders over a certain period of time. For the purpose of computing the level of target achievement, the TSR performance of GEA's share is compared with the TSR performance of the companies under the STOXX® Europe TMI Industrial Engineering index, measured on the basis of 3 months' averages, respectively. Computing the average helps even out share price fluctuations at the respective cutoff date. The ascertained TSR performance of all peer companies is ranked, whereupon GEA's relative position is determined by referring to GEA's ranking within this peer group. If GEA is positioned along the median (50th percentile), this equals a 100 percent level of target achievement. Should GEA's score be at the 25th percentile or below, the degree of target achievement is equivalent to 0 percent. If GEA is positioned at the 75th percentile or above, the degree of target achievement is 200 percent. The degrees of target achievement in between are measured by means of linear interpolation.

Target achievement curve relative Total Shareholder Return



The final number of virtual performance shares is computed by multiplying the number of provisionally granted phantom performance shares with the overall degree of target achievement from EPS growth while factoring in capital measures taken during the performance period as well as relative TSR. Eventually, the final payout is ascertained by multiplying the final number of performance shares with the average share price over the three months preceding the end of the performance period by taking into account dividends. The amount paid out is limited to 200 percent of the target value.

For further enhancing transparency, the final target achievement levels pertaining to EPS growth and relative TSR as well as the target range applicable to EPS growth will be published in the Remuneration Report following the end of the respective performance period. Hence, the relevant information on the tranche awarded for fiscal year 2019 under the Performance Share Plan will be provided in the company's 2021 Annual Report.

No payment of the 2019 tranche granted under the Performance Share Plan has been made yet, since it is forward-looking and computed over a period of three years; payout will not be made until fiscal year 2022. Based on the knowledge and information available as of December 31, 2019, the currently outstanding tranche under the Performance Share Plan (2019 tranche) is expected to outperform the set targets.

Different arrangements were agreed with Niels Erik Olsen against the backdrop of his departure on March 31, 2019 (see "Agreements governing the departure of former Executive Board members," page 102 ff.).

Granting and calibration of EPS growth under the tranche 2020*

As part of the second tranche of the Performance Share Plan granted for the current fiscal year (tranche 2020), the members of the Executive Board were each granted the following number of performance shares on the basis of a fair value per performance share of EUR 25.10 at the grant date of January 1, 2020:

*) This section is not part of the independent auditor's audit.

Participants Tranche 2020	Contractual target value (in EUR)	Number of performance shares granted
Stefan Klebert	1,080,000	43,028
Marcus A. Ketter	612,000	24,383
Johannes Giloth	540,000	21,514
Steffen Bersch*	540,000	21,514
Summe	**2,772,000**	**110,439**

*) Steffen Bersch receives the full number of performance shares. However, due to his departure at the end of February 29, 2020, the 2020 tranche of the performance share plan will be paid to him in March 2023, reduced pro rata temporis.

The 2020 tranche of the performance share plan is based on the following calibration of the financial performance target EPS growth, as resolved by the Supervisory Board: A target achievement of 100 percent is given if the annualized EPS growth rate in the performance period, which covers the financial years 2020 – 2022, is 11 percent. The target achievement corridor for EPS ranges from a CAGR of 6 percent during the performance period, which would correspond to target achievement of 0 percent, to a CAGR of 16 percent for the period 2020 – 2022, which would correspond to target achievement of 200 percent. A linear interpolation is performed between these values.

Malus & clawback

Under the new remuneration system, the Supervisory Board is given the possibility of reducing variable remuneration at its reasonable discretion if a member of the Executive Board has been found to have knowingly committed a gross violation of his or her statutory or contractual obligations or essential internal guidelines and policies. On the one hand, the target bonus and/or the number of performance shares allocated for the fiscal year in which said gross violation has taken place may be reduced to zero prior to the end of the performance period, if necessary (malus provisions). On the other hand, the amount already paid out for the respective fiscal year under the bonus and/or Performance Share Plan by the time the Supervisory Board resolves to reduce variable remuneration may be reclaimed, with the Executive Board member's repayment obligation being restricted to the net amount paid out (clawback provisions). For instance, criteria governing a reduction in variable remuneration include the severity of the violation, its impact on the company as well as the degree of fault that lies with the respective member of the Executive Board.

Share ownership guidelines

Under the new remuneration system, the members of the Executive Board are obliged to acquire GEA shares and hold them until the end of their period of service. These so-called share ownership guidelines (SOG) are to ensure that GEA's equity culture is further strengthened and that the Executive Board members are incentivized to sustainably increase the company's enterprise value for the benefit of our shareholders. This way, the members of the Executive Board are directly participating in the performance of the company. In addition, this scheme sends a clear signal to our employees, our shareholders as well as our other stakeholders, emphasizing the trust our Executive Board puts in GEA's strategic orientation and sustained success.

The CEO, Stefan Klebert, is obliged to hold shares in the amount of 150 percent of his fixed annual gross salary while Marcus A. Ketter, Steffen Bersch and Johannes Giloth are required to hold stock totaling 100 percent of their respective fixed annual gross salary. Until the SOG target is fully met, 25 percent of the net amount paid out within the framework of variable remuneration (bonus and Performance Share Plan) must be invested in shares every year if the respective stockholding obligation is not yet fulfilled, beginning with the 2019 bonus payout in March 2020.

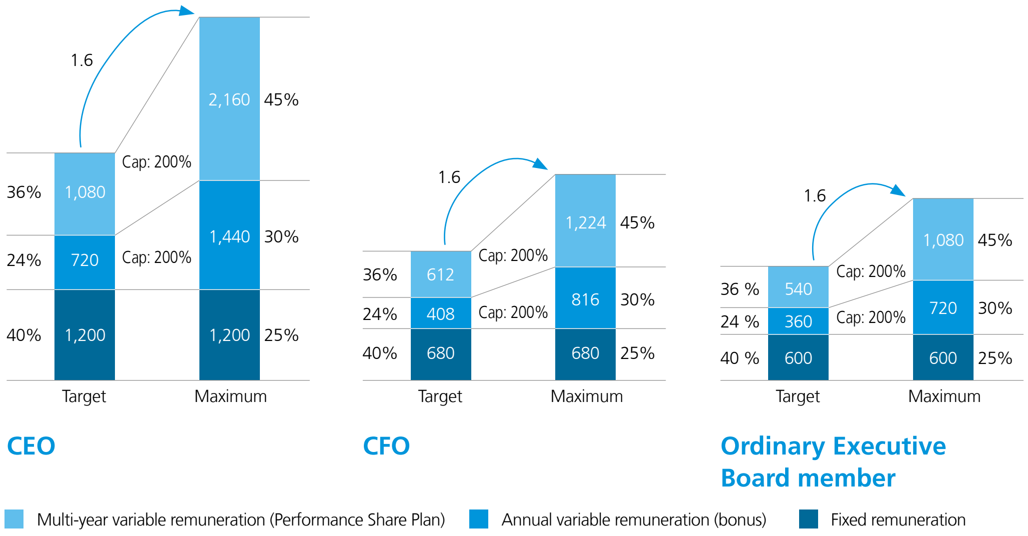
New remuneration structure and levels

When the new remuneration system was introduced in fiscal year 2019, direct target remuneration, i.e., the sum total of basic salary, target bonus and the target value of long-term variable remuneration, was increased to the following levels: CEO EUR 3 million p.a., CFO EUR 1.7 million p.a. and ordinary Executive Board members EUR 1.5 million p.a. This increase in direct target remuneration has aligned the remuneration levels awarded to Executive Board members – which, in part, used to be below standard market practice - with the remuneration levels paid in GEA's relevant reference markets. The market comparison took into account the companies listed in the MDAX as well as a sectoral peer group made up of engineering companies. Following the recommendations of the GCGC, the Supervisory Board did not only take into account a horizontal comparison, but also considered a vertical comparison juxtaposing Executive Board remuneration with the compensation awarded to the senior management and the general workforce.

The following chart shows the direct target remuneration levels as well as the respective maximum direct remuneration awarded to the members of the Executive Board:

Target remuneration and maximum direct remuneration levels

(in kEUR)



Previous remuneration scheme

The total remuneration awarded to the members of the Executive Board under the previous remuneration system comprises one fixed and three variable components (so-called direct remuneration) as well as commitments under the company pension scheme. Moreover, the Executive Board members are granted fringe benefits

Fixed components of remuneration and fringe benefits

The non-performance-related component of remuneration under the previous remuneration system also mainly consists of a fixed annual salary that is disbursed in twelve equal installments at the end of each calendar month.

In the year under review, the fixed annual salary awarded to Jürg Oleas amounted to EUR 1,250 thousand, Dr. Helmut Schmale was awarded EUR 700 thousand while Martine Snels received EUR 600 thousand. Due to their respective departure on February 17, 2019, and/or May 17, 2019, Jürg Oleas and Dr. Helmut Schmale were each awarded their fixed annual salary on a pro rata temporis basis.

In addition, the Executive Board members receive fringe benefits. In the year under review, the latter mainly comprised the value of the use of a company car, accident insurance premiums, and – in individual cases – the reimbursement of costs incurred for travel, accommodation, relocation, subsistence, as well as tax advisory services and legal consultancy.

Variable components of remuneration

In addition, under the previous remuneration system, each member of the Executive Board receives a variable annual remuneration (bonus) whose level depends on the achievement of specific targets set by the Supervisory Board. In the event of a target achievement of 100 percent, the level of variable remuneration equals that of the fixed remuneration component (target bonus). To ensure that both positive and negative developments are taken into account, the level of variable remuneration increases or decreases in the event of target over- or underachievement (even down to zero, as the case may be).

The bonus consists of three components. The latter comprise both one-year and multi-year bases of assessment. Each of the three components provides for a cap. Furthermore, taken together, all three bonus components applicable to a specific fiscal year are limited to 240 percent of the target bonus (overall cap). At its own dutiful discretion, the Supervisory Board takes into account extraordinary events and developments indicating that a readjustment of the respective value computed in line with the provisions set forth in the respective service agreement is appropriate.

Individual component (weighting of 40 percent)

The amount of the individual component is calculated on the basis of three to five individual annual targets determined for the respective fiscal year by the Supervisory Board. When setting these individual targets, the Supervisory Board primarily bases its decision on the sustainability of corporate governance such as revenue performance. The Supervisory Board’s definition of the individual targets also includes their respective weighting.

Different arrangements were agreed with Jürg Oleas and Dr. Helmut Schmale against the backdrop of their respective departure on February 17, 2019, and/or May 17, 2019 (see “Agreements governing the departure of former Executive Board members,” page 102 ff.).

Within the framework of variable remuneration, the individual component has a weighting of 40 percent, i.e., 40 percent of the variable remuneration (target amount) is payable if 100 percent of the target set in relation to the individual component is achieved. The overall degree of target achievement and, thus, the amount paid out under the individual component, are limited to 200 percent of this target amount (cap).

After the end of the fiscal year, the Supervisory Board decides on the degree of target achievement. For fiscal year 2019, the Supervisory Board has ascertained a 115.8 percent degree of target achievement (previous year: 118.3 percent) for Ms. Snels.

Multi-year component (weighting of 40 percent)

Performance measurement under the multi-year component takes place retrospectively for the previous 3 fiscal years. Thus, the period of assessment covers the respective fiscal year just ended, as well as the two preceding fiscal years. The basis of assessment is tied to key performance indicators embracing a combination of cash flow aspects (the so-called "cash flow driver margin" (CFDM)) and "return on capital employed" (ROCE).

The CFDM target is a simplified cash flow indicator (EBITDA minus capital expenditure in property, plant and equipment as well as intangible assets (Capex) minus change in working capital on a 12-month average) calculated as a ratio of revenue. The CFDM actually generated is calculated on the basis of average values achieved over the previous three years. The degree of target achievement results from a comparison between the achieved CFDM and the target value and/or target achievement range defined by the Supervisory Board. As for fiscal year 2019, 100 percent of the target is achieved if the group's CFDM throughout the preceding three-year period averages 5.07 percent (8 percent in 2018 and 2017, respectively). If the CFDM is lower or higher, the degree of target achievement will go up or down, with a CFDM of less than or equal to 1.57 percent (4.5 percent in 2018 and 2017, respectively) being equivalent to a target achievement of zero percent, while a CFDM greater than or equal to 10.32 percent (13.25 percent in 2018 and 2017, respectively) represents a maximum target achievement of 250 percent.

The level of the ROCE component (ROCE: return on capital employed), which is calculated on the basis of average values attained over the previous three years, corresponds to the ratio of earnings before interest and taxes (EBIT) to the capital employed, while excluding goodwill arising on the acquisition of the former GEA AG by the former Metallgesellschaft AG back in 1999 including effects attributable to the award proceedings. The degree of target achievement depends on the actual ROCE achieved compared with the target value and/or target achievement range defined by the Supervisory Board. In fiscal 2019, 100 percent of the target is achieved if the group's ROCE averages 9.8 percent (19 percent in 2018 and 2017, respectively) throughout the preceding three-year period. The target achievement range applicable to fiscal year 2019 is +/- 1.5 percentage points (+/- 5 percentage points in 2018 and 2017, respectively). If the actual ROCE level is greater than or less than the 100 percent target achievement level of 9.8 percent, but within the defined range of +/- 1.5 percentage points, the degree of target achievement is increased or reduced by up to 100 percentage points (by up to 50 percentage points in 2018 und 2017, respectively).

The ROCE target value and target achievement corridor were each adjusted to align the calibration of the multi-year component for fiscal year 2019 with the corresponding ROCE levels determined by the Supervisory Board for the 2019 bonus under the new remuneration system on the basis of the planning for fiscal year 2019. The adjustment of the target value and the target achievement range applicable to the CFDM key performance indicator under the multi-year component is based on the forecast for the 2019 fiscal year; this recalibration was only performed for fiscal year 2019. Since this adjustment of the key performance indicators under the multi-year component in relation to the 2019 planning had been inadvertently omitted in the first quarter of 2019, this omission was remedied by the Supervisory Board in December 2019 with effect for fiscal year 2019 and disclosed in the 2019 Declaration of Conformity (see Corporate Governance Report, page 76 ff.).

The key performance indicators CFDM and ROCE are adjusted for the impact of acquisitions made in fiscal year 2014 or later. With respect to acquisitions, such adjustment is performed in the year of first-time consolidation, and in the following fiscal year, respectively. The adjustment includes all acquisitions that require the consent of the Supervisory Board or the Presiding Committee of the Supervisory Board.

For calculating the overall degree of target achievement, the respective degrees of target achievement relevant to the individual key performance indicators CFDM and ROCE are multiplied. Under the variable remuneration component, the multi-year component has a weighting of 40 percent, i.e., 40 percent of variable remuneration is payable (target amount) if 100 percent of the target set in relation to the multi-year component is achieved. The overall degree of target achievement and, thus, the amount disbursed under the multi-year component is limited to 250 percent of this target amount (cap).

The target achievement level of the CFDM key performance indicator for fiscal year 2019 amounted to 22.8 percent (previous year: 47.2 percent), which corresponds to the weighted average of target achievement in fiscal years 2018 and 2017 (21.2 percent) and a target achievement of (25.9 percent for the 2019 fiscal year. The CFDM itself totaled 6.4 percent in fiscal year 2017, 4.1 percent in fiscal 2018 and 2.5 percent in the 2019 fiscal year.

For fiscal year 2019, the degree of ROCE target achievement amounts to 84.4 percent (previous year: 64.7 percent), which corresponds to the weighted average of target achievement in fiscal years 2018 and 2017 (50.0 percent) and a target achievement of 153.2 percent for the 2019 fiscal year. ROCE as such totaled 16.6 percent in fiscal year 2017, 11.2 percent in fiscal 2018 and 10.6 percent in the 2019 fiscal year.

Consequently, the overall degree of target achievement under the multi-year component for fiscal year 2019 amounted to 19.2 percent (previous year: 30.6 percent).

Share price component (weighting of 20 percent)

Performance measurement relating to the long-term share price component is conducted by taking a forward-looking approach. The period of assessment covers a three-year performance period including the relevant fiscal year for which the long-term share price component is granted, as well as the two subsequent fiscal years.

Under variable remuneration, the long-term share price component has a weighting of 20 percent, i.e., 20 percent of variable remuneration is payable (target amount) if 100 percent of the set target is achieved. The overall degree of target achievement and, thus, the amount paid out under the long-term share price component is limited to 300 percent of this target amount (cap).

Performance measurement for the relevant three-year performance period is conducted by means of a comparison between GEA's share performance (adjusted for dividends) and the performance of the STOXX® Europe TMI Industrial Engineering (TMI IE) index, in which numerous European industrial enterprises are listed. This comparison is computed on the basis of the respective arithmetic mean closing prices on the last 20 trading days preceding the start of the three-year performance period. 100 percent of the target is attained if the evolution of the daily arithmetic mean closing prices of GEA's share over the three-year performance period fully (i.e. 100 percent) corresponds to the relevant TMI IE performance during the three-year performance period. The degree of target achievement increases or decreases by 4 percent for each percentage point greater than or less than a performance level of 100 percent. In the event of outperformance greater than 100 percent, the amount disbursed rises to a maximum of 300 percent of the target amount. If the increase in GEA's share price over the three-year period is less than 100 percent of the growth in the TMI IE, the amount payable is reduced down to a performance level of 75 percent. Should GEA shares have dropped, the Supervisory Board may still award a payment if GEA shares have nonetheless outperformed the TMI IE. In this case, the decisions about whether to grant such payment and the level of the amount to be paid out are subject to the discretion of the Supervisory Board.

For the year under review, no payment under the long-term share price component granted for 2019 has yet been made as the latter is forward-looking and measured over a three-year period; the respective payment will not be made until fiscal year 2022. Instead, the 2017 tranche under the long-term share price component will be disbursed together with the 2019 individual component and multi-year component in March 2020. The target achievement level computed for the 2017 tranche amounts to 2.3 percent. In the actual year under review, the 2016 tranche in the amount of EUR 142 thousand was paid out on the basis of a 22.9 percent target achievement level.

As of December 31, 2019, the target achievement levels of the tranches under the long-term share price component that were still outstanding amounted to 88.2 percent for the 2019 tranche (performance period 2019 to 2021), 3.1 percent (previous year: 34.5 percent) for the 2018 tranche (performance period 2018 – 2020) and 2.3 percent (previous year: 30.2 percent) for the 2017 tranche (performance period 2017 to 2019).

Summary of the variable remuneration components

The following table summarizes the respective weightings and assessment periods applicable to the variable components under the previous remuneration system:

Variable remuneration component	Target	Weighting	Cap[1]	Overall cap[1]	Assessment period 2017	2018	2019	2020	2021
Individual component	Individual targets	40 %	200 %				One year		
Multi-year component	Combination of cash flow driver margin and ROCE	40 %	250 %	240 %	Backward-looking (3 years)				
Long-term share price component	Share price in relation to TMI IE	20 %	300 %				Forward-looking (3 years)		

1) As a percentage of the respective variable remuneration component (“cap“) and/or the target bonus (“overall cap“)

Under the previous remuneration scheme, the Supervisory Board may also grant a special bonus to all members of the Executive Board in exceptional circumstances if their activities have resulted in an extraordinary value enhancement for the benefit of the company’s shareholders. Exercising its dutiful discretion, the Supervisory Board may decide to grant such special bonus and set the respective amount. Within the framework of all Executive Board service agreements based on the previous remuneration system, this special bonus, which may only be awarded in exceptional circumstances and has never been granted up to this point in time, is subject to an express cap that corresponds to a maximum of 100 percent of the target bonus.

Pension commitments

Stefan Klebert, Marcus. A. Ketter and Johannes Giloth

As far as the company pension scheme is concerned, the new remuneration system provides for a contribution-oriented defined benefit that serves as a standard. The pension commitments vest immediately and comprise pension, surviving dependents' as well as incapacity benefits. As part of their retirement benefits, the accrued capital is available to the Executive Board members from age 62 onwards. If an Executive Board member leaves the company due to incapacity to work, he/she is entitled to receive incapacity benefits. Should a member of the Executive Board pass away before reaching the age of 62, his/her surviving dependents, i.e., his/her surviving spouse or partner or the surviving children are entitled to surviving dependents' benefits. The amount of incapacity and surviving dependents' benefits is equivalent to the accrued pension capital. If a member of the Executive Board dies after the occurrence of a pension event, his/her surviving dependents are entitled to receive the residual capital.

For meeting its pension commitments, the company sets up a pension account for each Executive Board member and deposits the contractually agreed pension contributions into this account on a monthly basis. Monthly pension contributions are granted for each month during the term of the Executive Board service agreement. The monthly pension contribution made for Stefan Klebert amounts to EUR 33,333 (gross), EUR 25,000 (gross) for Marcus A. Ketter and EUR 16,666.67 for Johannes Giloth. Apart from that, the members of the Executive Board have the possibility of participating in a deferred compensation scheme up to a maximum amount of EUR 100 thousand per year.

Upon retirement, the available pension capital and, thus, the level of pension benefits, results from the pension contributions paid into the pension account by the time pension benefits are paid out, including the performance of the pension account during the investment period. The company guarantees a nominal return of premium, i.e., at least the aggregate amount of the company-funded pension contributions and the deferred contributions is available at the time the pension capital falls due. The latter may be paid out as a lump sum or in up to 20 annual installments, with outstanding installments continuing to earn 1 percent interest per year.

Pension commitments under this scheme were made to Stefan Klebert, Marcus A. Ketter and Johannes Giloth. The pension commitments vis-à-vis Steffen Bersch under the previous remuneration system and the agreement concluded with Niels Erik Olsen instead of a pension commitment will continue to apply and remain unchanged, although Steffen Bersch and Niels Erik Olsen switched to the new remuneration system as of January 1, 2019.

Martine Snels

The pension commitments made to Martine Snels by and large correspond to the pension scheme under the new remuneration system. The monthly pension contribution for Ms. Snels totals EUR 27,754 gross. However, its level is in line with the regular pension benefits awarded to ordinary Executive Board members under the previous remuneration system, i.e., there is a pension benefit adding up to EUR 200 thousand p.a. payable from age 62, which is fully vested after 10 years of service on the Executive Board. As a consequence, the monthly pension contribution for Martine Snels is granted for a maximum of 120 months. For the other terms and conditions governing pension commitments, please refer to the information provided in connection with the pension commitments made to Stefan Klebert, Marcus A. Ketter and Johannes Giloth.

With regard to her pension commitment, Martine Snels was treated as if she had fulfilled her contract of employment when she left the company early by mutual agreement. Therefore, the amounts for the company pension scheme for the period from January 1, 2020, to September 30, 2020, in the total amount of EUR 249,786.00 were paid into Martine Snels' pension account in December 2019.

Steffen Bersch

The contractual pension benefits of Steffen Bersch amount to a maximum of EUR 200 thousand p.a. Under this arrangement, maximum pension benefits will be paid once his service agreement ends when or after he reaches the age of 62 or in the event of his permanent incapacity to work. As Steffen Bersch's service agreement ended with his departure on February 29, 2020, and, thus, before one of the above conditions for payment of his pension was met, Steffen Bersch has vested rights to a pro rata annual pension in the amount of EUR 90,791.06 that becomes payable once he reaches the age of 62. His pro rata annual pension is composed of two elements: First, vested benefits to the tune of EUR 12,784.68 that do not result from deferred compensation and were earned while Steffen Bersch was working for companies of GEA Group prior to his appointment to the Executive Board. In addition, there is an amount of EUR 78,006.38 (resp. EUR 74,886.11 as of December 31, 2019), that equals the vested pension benefits Steffen Bersch has earned during the 4 years and 2 months of his service as an Executive Board member. In order to earn the maximum pro rata annual pension of EUR 200 thousand p.a., Steffen Bersch's tenure on the Executive Board would have had to last 10 years. His regular pension will be adjusted annually in line with the consumer price index.

The company covers the employer's contribution to the state pension scheme payable for Steffen Bersch's voluntary enrollment in the scheme.

In addition, Steffen Bersch is entitled to vested benefits to the tune of EUR 23,428 p.a. from personal contributions made prior to his appointment to the Executive Board in connection with his participation in GEA's executive pension scheme.

The surviving dependents' benefits defined in Steffen Bersch's service agreement basically provide for a lifelong widow's pension as well as an orphan's pension. The widow's pension specified totals 60 percent of Steffen Bersch's retirement pension. The orphan's pension is a specific percentage of the retirement pension and its amount depends on the number of children and on whether they are full or half orphans. In principle, entitlement to an orphan's pension expires on reaching the age of legal majority, but at the latest on reaching the age of 25 if the child in question is still in full-time education and/or completes vocational or professional training. Collectively, widow's and orphan's pensions must not exceed the level of the retirement pension.

Jürg Oleas

The contractual pension benefits of Jürg Oleas amount to a maximum of EUR 360 thousand per year. His pension benefits would have been fully vested in April 2019 after 18 years of service. Jürg Oleas turned 62 in December 2019 and his service agreement would originally also have expired at the end of December 2019. Against this backdrop, and within the framework of Jürg Oleas's mutually agreed premature departure on February 17, 2019, the parties agreed that Jürg Oleas would be entitled to a pension in the amount of EUR 360 thousand p.a. with effect from January 1, 2020 (more details are specified in the section on "Agreements governing the departure of Jürg Oleas," page 102 f.). His regular pension benefits will be adjusted annually in line with the consumer price index.

The surviving dependents' benefits defined in Jürg Oleas's service agreement are in line with the provisions outlined above in relation to Steffen Bersch, with Jürg Oleas's wife being entitled to a widow's pension that amounts to 20 percent of his pension.

Dr. Helmut Schmale

Dr. Helmut Schmale's contractual pension benefits amount to a maximum of EUR 200 thousand per annum. Under this arrangement, maximum pension benefits are paid once his service agreement ends when or after Dr. Schmale reaches the age of 62 or in the event of his permanent incapacity to work. His pension benefits are fully vested since Dr. Helmut Schmale turned 62 in November 2018. Against this backdrop, and within the framework of Dr. Helmut Schmale's mutually agreed premature departure on May 17, 2019, the parties agreed that he would be entitled to a pension in the amount of EUR 200 thousand p.a. with effect from January 1, 2020 (more details are specified in the section on "Agreements governing the departure of Dr. Helmut Schmale," page 104). His regular pension benefits will be adjusted annually in line with the consumer price index.

The company covers the employer's contribution to the state pension scheme payable for Dr. Helmut Schmale's voluntary enrollment in the scheme. The surviving dependents' benefits defined in Dr. Helmut Schmale's service agreement are in line with the provisions outlined above in relation to Steffen Bersch.

Niels Erik Olsen

Instead of pension benefits, Niels Erik Olsen receives a monthly compensation for the purpose of making private provisions for old age and surviving dependents. This monthly compensation totals a gross amount of EUR 20,751.15. Its level is in line with the regular pension benefits awarded to ordinary Executive Board members, i.e., a pension benefit totaling EUR 200 thousand p.a. payable from age 62 that is fully vested after 10 years of service as an Executive Board member. As a consequence, the monthly pension contribution for Niels Erik Olsen is granted for a maximum of 120 months. Niels Erik Olsen may use this monthly compensation as he deems fit.

Pension plan reinsurance and capitalization option

As the contractual pension commitments made to the members of the Executive Board under the previous remuneration system were only partly protected against insolvency, namely in the amount of the sum covered by the Pensions-Sicherungs-Verein (PSV – Pension Protection Fund), the Supervisory Board decided in 2014 to take out pension plan reinsurance policies to secure the proportion of the pension commitments not covered by the PSV for the benefit of the individual Executive Board members. At the same time, the members of the Executive Board were granted a capitalization option. The level of the capitalization amount is equivalent to the pension liabilities ascertained by applying the basis of calculation used for the purpose of preparing the consolidated financial statements. Such capitalization option may be exercised upon retirement, but no earlier than age 62. It is possible to exercise this option in part or several times. Each exercise of the capitalization option entails a corresponding reduction in entitlements regarding the contractually guaranteed benefits for surviving dependents.

In the year under review, Jürg Oleas exercised his capitalization option with regard to the full pension benefits he was entitled to as of January 1, 2020. The capitalization amount of EUR 8,575,416.00 was paid out in January 2020.

Since Niels Erik Olsen is not entitled to any contractual pension benefits, the capitalization option does not apply in his specific case. Neither Niels Erik Olsen, Martine Snels nor the Executive Board members Stefan Klebert, Marcus A. Ketter and Johannes Giloth, who are compensated in accordance with the new remuneration system, are covered by a pension plan reinsurance.

Pension scheme contributions and provisions for pension obligations

The company has set aside pension provisions to cover the future entitlements of the Executive Board members. The additions to pension provisions for active Executive Board members created by the end of the 2019 fiscal year in accordance with IFRS are listed individually in the table below. The corresponding amounts comprise service cost as well as interest cost.

(in EUR)	Pension benefits p. a. (as of 12/31/2019; annual entitlement upon retirement)	Annual pension entitlements earned as of 12/31/2019	Addition to pension provisions in fiscal year 2019	Present value of pension benefits as of 12/31/2019
Stefan Klebert[1]	172,500	22,500	400,863	2,624,131
Markus A. Ketter[1]	164,234	9,234	184,677	2,398,954
Jürg Oleas[2]	360,000	360,000	224,042	9,458,434
Dr. Helmut Schmale[3]	200,000	200,000	103,046	6,493,025
Steffen Bersch[4]	223,428	111,099	512,735	3,335,662[5]
Martine Snels[1]	49,957	49,957	589,386	1,081,830
Total	**1,170,119**	**752,790**	**2,014,749**	**25,392,036**

1) The entitlements result from the sum of the contributions at the respective time, divided into a maximum of 20 annual installments, excluding investment return.
2) Jürg Oleas stepped down from the Executive Board on February 17, 2019.
3) Dr. Helmut Schmale stepped down from the Executive Board on May 17, 2019.
4) Along with his pension benefits in the amount of EUR 200,000 p.a. in his capacity as a member of the Executive Board, Steffen Bersch is also entitled to vested benefits in the amount of EUR 23,428 p.a. from personal contributions made under GEA's executive pension scheme prior to his appointment to the Executive Board (calculated on the basis of a retirement age of 62).
5) Specification of the defined benefit obligation instead of the present value due to the departure of Steffen Bersch in February 2020.

Premature termination of appointment, termination rights, change of control events and effects on remuneration

The rules and regulations applicable under the new remuneration scheme in the event of the premature termination of the appointment of a member of the Executive Board as well as the ensuing ramifications for remuneration are closely aligned with the corresponding provisions stipulated within the framework of the previous remuneration system. However, some aspects of the new remuneration system differ from the provisions set forth under the previous remuneration scheme:

Both the new remuneration system and the previous remuneration system stipulate that, if the appointment of an Executive Board member is revoked for good cause with legal effect in accordance with s. 84 para. 3 AktG or if an Executive Board member validly resigns from office pursuant to s. 84 para. 3 AktG, the Executive Board member's service agreement will – as a rule – end on expiry of the statutory notice period pursuant to s. 622 para. 1, 2 Bürgerliches Gesetzbuch (BGB – German Civil Code). However, if the appointment is revoked due to an individual's inability to properly manage the company as defined in s. 84, para. 3 AktG, the notice period is eight months to the end of the month.

In the aforementioned cases involving the early termination of his/her appointment, an Executive Board member will first of all receive the variable remuneration he or she has earned up to the date of his or her departure under both remuneration systems. Moreover, the departing Executive Board member receives a severance payment in the amount of the total remuneration agreed for the remaining term of the service agreement to compensate for his/her early departure from the company, but no more than two years' remuneration (severance payment cap). Both remuneration systems provide that these benefits will lapse when the appointment of the Executive Board member is terminated for good cause in accordance with s. 626 BGB and would have warranted a termination for cause. Under the previous remuneration system, however, merely the outstanding and undisbursed annual tranches of the long-term share price component are forfeited in the event of a voluntary resignation without good cause or as a result of a termination for good cause by the company. Previously earned remuneration under the multi-year component remains unaffected.

For computing severance pay entitlements, the new remuneration system provides for a target achievement level of 100 percent applicable to any unvested remuneration for the current and further fiscal years, as the case may be. In contrast, the severance payment under the previous remuneration system is calculated on the basis of an 85 percent degree of target achievement, factoring in the respective Executive Board member's total annual remuneration received during the two calendar years preceding the termination of the service agreement.

The service agreements concluded with the Executive Board members under the new remuneration system do not provide for termination or any other rights in the event of a change of control, nor any benefits associated therewith.

In the event of a change of control, Executive Board members may opt for an early payment at target value of any outstanding, fully vested tranches under the share price component. This option applies regardless of whether or not the respective Executive Board member leaves the company in connection with the change of control event. A change of control event is deemed to have occurred as soon as the company is notified that a shareholder has reached or exceeded 50 percent or 75 percent of the voting rights in the company, that an intercompany agreement is entered into with the company as a dependent company in accordance with s. 291 ff. AktG, or that an absorption under s. 319 AktG or a change of legal form of the company in accordance with the Umwandlungsgesetz (UmwG – German Reorganization Act) is resolved with legal effect. In the event of a change of control, the Executive Board members have no right to unilaterally terminate their respective service agreements.

Jürg Oleas's service agreement provided for a unilateral right of termination on his part in case the Supervisory Board revoked his appointment as CEO without simultaneously declaring the effective revocation of his appointment as a member of the Executive Board in accordance with s. 84 para. 3 Aktiengesetz (AktG – German Stock Corporation Act). If he had exercised his unilateral right of termination and left the Executive Board, he would have been entitled to receive the corresponding fixed salary for the remaining months of his contractual term, but no longer than eight months. Jürg Oleas left GEA Group by mutual agreement on February 17, 2019. Detailed information on the arrangements made in this context is outlined in the section on "Agreements governing the departure of former Executive Board members."

Agreements governing the departure of former Executive Board members

Jürg Oleas

Jürg Oleas left GEA Group by mutual agreement at midnight on February 17, 2019. Within the framework of a termination agreement, both his appointment as CEO of GEA Group Aktiengesellschaft and his service agreement were terminated at that date.

Until the date of his departure, Jürg Oleas continued to receive his fixed monthly salary, which was paid out on a pro rata temporis basis for the month of February 2019. His bonus for fiscal year 2018 and the long-term share price component for 2016 were calculated in accordance with the provisions set forth in his service agreement and disbursed in March 2019. In addition, the long-term share price components for 2017 and 2018 were also calculated and paid out on the basis of his service agreement. The pro-rata variable remuneration for the period January 1, 2019, to February 17, 2019, was paid out in February 2019 and computed on the basis of an assumed target achievement level of 85 percent that was consistently applied to all bonus components.

In compensation for his mutually agreed early departure, Jürg Oleas was granted a severance package in the total amount of EUR 2,030,842.88 that was also paid out in February 2019. The severance pay includes foregone remuneration as well as the fringe benefits foregone for the period February 18, 2019, to the end of the original term of Jürg Oleas's service agreement on December 31, 2019. The nature and the computation of the severance package are based on the provisions governing the legitimate resignation or the revocation of an appointment for good cause as outlined in the section on "Premature termination of appointment, termination rights, change of control events and effects on remuneration" (see page 101 f.). Hence, the bonus entitlement in relation to the above period was calculated on the basis of an assumed target achievement level of 85 percent. Apart from this severance pay, Jürg Oleas did not receive any further payments in connection with his mutually agreed premature departure from the company.

As regards his pension benefits and surviving dependents' benefits, Jürg Oleas was treated as if he had fulfilled his service agreement. His contractual pension benefits would have been fully vested at the end of April 2019. As a consequence, Jürg Oleas would have received an annual pension in the amount of EUR 360 thousand (gross) as of January 1, 2020, since he reached the age of 62 in December 2019.

Niels Erik Olsen

Niels Erik Olsen left GEA Group by mutual agreement at midnight on March 31, 2019. Within the framework of a termination agreement, both his appointment as member of the Executive Board of GEA Group Aktiengesellschaft and his service agreement were terminated at that date.

Until the date of his departure, Niels Erik Olsen continued to receive his fixed monthly salary as well as the monthly EUR 20,751.15 cash payment in lieu of a pension contribution. His bonus for fiscal year 2018 and the long-term share price component for 2016 were calculated in accordance with the provisions set forth in his service agreement and paid out in March 2019. In addition, the long-term share price components for 2017 and 2018 will also be calculated and disbursed on the basis of his service agreement. The pro-rata variable remuneration for the period January 1, 2019, to March 31, 2019, was paid out in March 2019 and computed on the basis of an assumed target achievement level of 100 percent that was consistently applied to all bonus components.

In compensation for his mutually agreed early departure, Niels Erik Olsen was granted a severance package in the total amount of EUR 2.95 million that was also paid out in March 2019. This severance pay comprises foregone remuneration, including the cash payments in lieu of pension contributions, as well as the fringe benefits foregone for the period April 1, 2019, to the end of the original term of Niels Erik Olsen's service agreement on December 31, 2021. The nature and the amount of the severance package are based on the provisions governing the legitimate resignation or the revocation of an appointment for good cause under the new remuneration agreement outlined in the section on "Premature termination of appointment, termination rights, change of control events and effects on remuneration" (see page 101 f.). Hence, his entitlement to variable remuneration for the remaining term of his service agreement was calculated on the basis of an assumed target achievement level of 100 percent. Apart from this severance pay, Niels Erik Olsen did not receive any further payments in connection with his mutually agreed premature departure from the company.

Niels Erik Olsen agreed to a post-contractual non-compete clause for which he received compensation; however, the latter was fully offset against the severance payment of EUR 2.95 million.

Dr. Helmut Schmale

Dr. Helmut Schmale left GEA Group by mutual agreement at midnight on May 17, 2019. Within the framework of a termination agreement, both his appointment as CFO of GEA Group Aktiengesellschaft and his service agreement were terminated at that date.

Until the date of his departure, Dr. Helmut Schmale continued to receive his fixed monthly salary, which was paid on a pro rata temporis basis for the month of May 2019. The long-term share price components for 2017 and 2018 will be calculated and paid out in accordance with the provisions set forth in his service agreement. The pro-rata bonus for the period January 1, 2019, to May 17, 2019, was paid out in May 2019 and computed on the basis of an assumed target achievement level of 85 percent that was consistently applied to all bonus components.

In compensation for his mutually agreed early departure, Dr. Helmut Schmale was granted a severance package in the total amount of EUR 832,948.20 that was also paid out in May 2019. This severance pay includes foregone remuneration as well as the fringe benefits foregone for the period May 18, 2019, to December 31, 2019, with the original term of Dr. Helmut Schmale's service contract expiring on March 31, 2021. The nature and the computation of the severance package are based on the provisions governing the legitimate resignation or the revocation of an appointment for good cause as outlined in the section on "Premature termination of appointment, termination rights, change of control events and effects on remuneration" (see page 101 f.). Hence, the bonus entitlement in relation to the above period was calculated on the basis of an assumed target achievement level of 85 percent. Apart from this severance pay, Dr. Helmut Schmale did not receive any further payments in connection with his mutually agreed premature departure from the company.

At the time of his departure, Dr. Helmut Schmale's contractual pension entitlements were already fully vested, since he had reached the age of 62 in November 2018. From January 1, 2020, Dr. Helmut Schmale will receive an annual pension in the amount of EUR 200 thousand gross.

Martine Snels

Martine Snels left GEA Group by mutual agreement at midnight on December 31, 2019. Within the framework of a termination agreement, both her appointment as member of the Executive Board of GEA Group Aktiengesellschaft and her service agreement were terminated at that date.

Until the date of her departure, Martine Snels continued to receive her fixed monthly salary as well as the monthly contributions to the company pension scheme in the amount of EUR 27,754.00. Her bonus for fiscal year 2019 and the long-term share price component for 2017 will be calculated in accordance with the provisions set forth in her service agreement and paid out in March 2020. In addition, the long-term share price components for 2018 and 2019 will also be calculated and paid out on the basis of her service agreement.

In compensation for her mutually agreed early departure, Martine Snels was granted a severance package in the total amount of EUR 854,849.70 that was paid out in December 2019. This severance pay comprises foregone remuneration as well as the fringe benefits foregone for the period January 1, 2020, to the end of the original term of Martine Snels's service agreement on September 30, 2020. The nature and the computation of the severance package are based on the provisions governing the legitimate resignation or the revocation of an appointment for good cause under the new remuneration agreement outlined in the section on "Premature termination of appointment, termination rights, change of control events and effects on remuneration" (see page 101 f.). Hence, her bonus entitlement for the remaining term of her service agreement was calculated on the basis of an assumed target achievement level of 85 percent. The contributions to Martine Snel's company pension scheme for the period January 1, 2020 to September 30, 2020, in the total amount of EUR 249,786.00 were also paid into the Martine Snels's pension account in December 2019. Martine Snels did not receive any further payments in connection with her mutually agreed premature departure from the company.

Steffen Bersch

Steffen Bersch left GEA Group by mutual agreement at midnight on February 29, 2020. Within the framework of a termination agreement, both his appointment as member of the Executive Board of GEA Group Aktiengesellschaft and his service agreement were terminated at that date.

Until the date of his departure, Steffen Bersch continued to receive his fixed monthly salary as well as the employer's contribution to the state pension scheme. His bonus for fiscal year 2019 and the long-term share price component for fiscal year 2017, which is still granted under the previous remuneration system, were calculated on the basis of the terms and conditions enshrined in his service agreement and will be paid out in March 2020. The long-term share price component for fiscal year 2018 will be disbursed in March 2021. The 2019 tranche awarded to Steffen Bersch under the Performance Share Plan will be computed on the basis of the provisions set forth in his service agreement and paid out in March 2022.

For fiscal year 2020, Steffen Bersch received a pro-rata bonus in the amount of EUR 60 thousand for the months of January and February that was uniformly computed on the basis of a 100 percent target achievement level. The pro-rata bonus fell due and was paid out upon his departure on February 29, 2020. Steffen Bersch was granted the 2020 tranche under the Performance Share Plan, which will be computed in accordance with the provisions set forth in his service agreement and disbursed pro rata temporis in March 2023.

In connection with his mutually agreed premature departure from the company, Steffen Bersch did not receive any severance pay or any other benefits of a compensatory nature.

Steffen Bersch's pro rata annual pension upon retirement amounts to EUR 90,791.06 EUR. In addition, Steffen Bersch is entitled to vested benefits to the tune of EUR 23,428 from personal contributions made prior to his appointment to the Executive Board in connection with his participation in GEA's executive pension scheme (see "Pension commitments," page 99). Steffen Bersch has declared that the pension plan reinsurance taken out to partially secure his claims or entitlements to pension benefits need no longer be continued to the extent that there is over-collateralization.

Remuneration of the members of the Executive Board

Total remuneration in 2019 and 2018

In the year under review, the total remuneration paid to the active Executive Board members of GEA Group Aktiengesellschaft amounted to EUR 8,851,636 and comprised both an amount of EUR 3,463,589 for fixed salaries and an amount of EUR 5,101,557 for variable remuneration. The amounts under the Performance Share Plan of the new remuneration system and the long-term share price component under the previous remuneration system are based on the fair value of the entitlement at grant date (January 1, 2019). In the year under review, they amounted to EUR 1,080,000 for Stefan Klebert, EUR 378,937 for Marcus A. Ketter, EUR 540,000 for Steffen Bersch, and EUR 111,972 for Martine Snels, i.e., a total of EUR 2,110,909. Neither Jürg Oleas, Niels Erik Olsen nor Dr. Helmut Schmale, who each departed in the first and/or second quarter of 2019, were granted any performance shares and/or long-term share price components.

In the 2018 fiscal year, the total remuneration paid to the active Executive Board members amounted to EUR 7,234,079 and comprised both an amount of EUR 4,149,014 for fixed salaries and an amount of EUR 2,846,200 for variable remuneration. The bonus under the long-term share price component was based on the fair value of the entitlement at grant date (January 1, 2018). In the year under review, it amounted to EUR 201,500 for Jürg Oleas, EUR 112,840 for Dr. Helmut Schmale, EUR 96,720 for Steffen Bersch, EUR 96,720 for Niels Erik Olsen and EUR 96,720 for Martine Snels, i.e., a total of EUR 604,500.

The following table shows an individualized breakdown of fixed remuneration, variable components and other income:

(in EUR)	Fixed remu-neration	Variable components					Non-cash benefits	Pension subsidies	Total
		Bonus (new remunera-tion system)	Performance Share Plan[1] (new remunera-tion system)	Individual component (previous remuneration system)	Multi-year component (previous remunera-tion system)	Long-term share price component[1] (previous remuneration system)			
Stefan Klebert	1,200,000	1,132,661	1,080,000	–	–	–	18,328	–	**3,430,989**
Previous year	150,000	–	–	225,000[4]	–	–	36,304	–	**411,304**
Marcus A. Ketter	418,602	398,933	378,937	–	–	–	41,454	–	**1,237,926**
Previous year	–	–	–	–	–	–	–	–	**–**
Steffen Bersch	600,000	542,234	540,000	–	–	–	109,098	7,477	**1,798,809**
Previous year	600,000	–	–	279,600	73,440	96,720	17,547	7,254	**1,074,561**
Martine Snels	600,000	–	–	277,920	46,080	111,972	34,725	–	**1,070,697**
Previous year	600,000	–	–	283,920	73,440	96,720	42,355	–	**1,096,435**
Niels Erik Olsen[4]	212,253	225,000[2]	–	–	–	–	50,278	–	**487,531**
Previous year	849,014[3]	–	–	249,600	73,440	96,720	54,834	–	**1,323,608**
Jürg Oleas[5]	167,411	–	–	142,299[2]	–	–	5,779	–	**315,489**
Previous year	1,250,000	–	–	475,500	153,000	201,500	33,541	–	**2,113,541**
Dr. Helmut Schmale[6]	265,323	–	–	225,521[2]	–	–	16,517	2,834	**510,195**
Previous year	700,000	–	–	269,080	85,680	112,840	39,776	7,254	**1,214,630**
Total	**3,463,589**	**2,298,828**	**1,998,937**	**645,740**	**46,080**	**111,972**	**276,179**	**10,311**	**8,851,636**
Previous year	**4,149,014**	**–**	**–**	**1,782,700**	**459,000**	**604,500**	**224,357**	**14,508**	**7,234,079**

1) In the year under review, no payment under the long-term share price component granted for 2019 and under the 2019 Performance Share Plan was made as these components are computed over a three-year period between 2019 and 2021. The bonus payable under the long-term share price component and/or the Performance Share Plan is based on the fair value of the entitlement at grant date (January 1, 2019).
2) The amounts each represent the entitlement to all bonus components calculated on an 85 percent degree of target achievement for Jürg Oleas and Dr. Helmut Schmale and/or a 100 percent target achievement level for Niels Erik Olsen, covering the period January 1, 2019 to their respective dates of departure; for more information see section on "Agreements governing the departure of former Executive Board members."
3) The amount of EUR 849,014 EUR comprises the annual fixed remuneration of EUR 600,000 as well as the annual compensation amount of EUR 249,014 Niels Erik Olsen receives instead of pension benefits.
4) Niels Erik Olsen stepped down from the Executive Board on March 31, 2019.
5) Jürg Oleas stepped down from the Executive Board on February 17, 2019.
6) Dr. Helmut Schmale stepped down from the Executive Board on May 17, 2019.

Supplemental disclosures relating to share-based remuneration for the period 2017 to 2019

In fiscal years 2017 to 2019, each Executive Board member was granted a share-based remuneration in the form of the long-term share price component under the previous remuneration system. Details of the existing entitlements of the members of the Executive Board under this remuneration component are shown in the table below.

Long-term share price component (in EUR)	Fair value as of 12/31/2019	Fair value as of 12/31/2018
Jürg Oleas[1]	8,225	65,475
Dr. Helmut Schmale[2]	4,606	36,666
Steffen Bersch	3,754	30,049
Niels Erik Olsen[3]	3,754	30,049
Martine Snels	121,245	3,883
Total	**141,584**	**166,122**

1) Termination of Executive Board service agreement in February 2019.
2) Termination of Executive Board service agreement in May 2019.
3) Termination of Executive Board service agreement in March 2019.

The decrease in fair value of the long-term share price component as of December 31, 2019 is due to the poorer performance of GEA's share price for the 2017 and 2018 tranches compared with the performance of the STOXX® Europe TMI Industrial Engineering benchmark index.

For the first time, the Executive Board was awarded a share-based remuneration under the new remuneration system in the form of a tranche of the Performance Share Plan in the 2019 fiscal year. Details of the existing entitlements of the members of the Executive Board under this remuneration component are shown in the table below.

Performance Shares	Performance shares granted at vesting date (in number of shares)	Fair value (in EUR) as of 12/31/2019	Fair value (in EUR) as of 12/31/2018
Stefan Klebert			
2019 tranche	50,358	2,116,496	–
Marcus A. Ketter			
2019 tranche	17,669	742,610	–
Steffen Bersch			
2019 tranche	25,179	1,058,248	–
Total	**93,206**	**3,917,354**	**–**

In fiscal year 2019, total expenditure for share-based remuneration under the two remuneration systems (i.e., the sum total of the fair value of share-based remuneration awarded in the fiscal year in question as of balance sheet date and the change in fair value in relation to entitlements under share-based remuneration in the fiscal year in question) that was recognized in the consolidated IFRS financial statements amounted to EUR 2,116 thousand for Stefan Klebert (no shares granted in the previous year), EUR 743 thousand for Marcus A. Ketter (no shares granted in the previous year), EUR 1,058 thousand for Steffen Bersch (first tranche under the Performance Share Plan and outstanding long-term share price components; previous year: EUR –72 thousand), EUR 117 thousand for Martine Snels (previous year: EUR –55 thousand), EUR 0 thousand for Jürg Oleas (previous year: EUR –158 thousand), EUR 0 thousand for Dr. Helmut Schmale (previous year: EUR –88 thousand) and EUR 0 thousand for Niels Erik Olsen (previous year: EUR –72 thousand). Further information on the Performance Share Plan and the long-term share price component is outlined in note 6.3.3 (see page 232 ff.).

Supplemental disclosures relating to recognized expenditure and disbursed remuneration

In fiscal year 2019, expenditure in the aggregate amount of EUR 17,344,569 (previous year: EUR 10,937,985) was recognized for the members of the Executive Board. Besides expenditure for fixed and variable remuneration, this amount also comprises non-cash benefits, pension subsidies, additions to pension provisions (service and interest cost), changes in the value of the entitlements to share-based remuneration that were recognized as interest expense as well as expenses for severance payments. In fiscal year 2019, remuneration components totaling EUR 13,169,762 (previous year: EUR 7,156,267) were paid out. Apart from non-performance-related remuneration components, the amounts paid out also include disbursements of variable remuneration for the previous year, amounts disbursed under multi-year variable remuneration components in the year under review as well as severance payments.

(in EUR)	Recognized expenditure	Disbursements
Stefan Klebert	4,868,348	1,218,328
Previous year	461,304	411,304
Marcus A. Ketter	1,786,276	460,056
Previous year	–	–
Steffen Bersch	2,829,569	1,095,721
Previous year	1,402,850	957,909
Niels Erik Olsen[1]	3,437,399	3,786,677
Previous year	1,155,301	1,182,692
Martine Snels	2,520,322	1,846,935
Previous year	1,361,392	717,980
Johannes Giloth	750,000	–
Previous year	–	–
Jürg Oleas[2]	539,456	3,032,082
Previous year	4,430,484	2,106,791
Dr. Helmut Schmale[3]	613,199	1,729,963
Previous year	2,126,654	1,198,014
Markus Hüllmann[4]	–	–
Previous year	–	70,070
Dr. Stephan Petri[5]	–	–
Previous year	–	511,507
Total	**17,344,569**	**13,169,762**
Previous year	**10,937,985**	**7,156,267**

1) Termination of Executive Board service agreement in March 2019.
2) Termination of Executive Board service agreement in February 2019.
3) Termination of Executive Board service agreement in May 2019.
4) Termination of Executive Board service agreement in December 2015.
5) Termination of Executive Board service agreement in June 2016.

Executive Board remuneration in accordance with the GCGC model tables

Model table 1 referring to section 4.2.5 para. 3 (1st indent) GCGC "Value of the benefits granted for the reporting period"

Benefits granted	Stefan Klebert				Marcus A. Ketter			
	CEO				CFO			
					As of 05/20/2019			
	2018	2019	Min. 2019	Max. 2019	2018	2019	Min. 2019	Max. 2019
Fixed remuneration	150,000	1,200,000	1,200,000	1,200,000	0	418,602	418,602	418,602
Fringe benefits	36,304	18,328	18,328	18,328	0	41,454	41,454	41,454
Pension subsidies	0	0	0	0	0	0	0	0
Total non-performance-related components	**186,304**	**1,218,328**	**1,218,328**	**1,218,328**	**0**	**460,056**	**460,056**	**460,056**
One-year variable remuneration	**225,000**	**720,000**	**0**	**1,440,000**	**0**	**252,625**	**0**	**505,250**
Bonus (new remuneration system)		720,000	0	1,440,000	0	252,625	0	505,250
Individual component (previous remuneration system)	225,000[2]	0	0	0	0	0	0	0
Multi-year variable remuneration	**0**	**1,080,000**	**0**	**2,160,000**	**0**	**378,937**	**0**	**757,874**
Performance Share Plan (new remuneration system) (2019 tranche)[1]	0	1,080,000	0	2,160,000	0	378,937	0	757,874
Multi-year component (previous remuneration system)	0	0	0	0	0	0	0	0
Long-term share price component (previous remuneration system) (2018 tranche)[1]	0	0	0	0	0	0	0	0
Long-term share price component (previous remuneration system) (2019 tranche)[1]	0	0	0	0	0	0	0	0
Total performance-related components	**225,000**	**1,800,000**	**0**	**3,600,000**	**0**	**631,562**	**0**	**1,263,124**
Service cost	50,000	400,000	400,000	400,000	0	184,677	184,677	184,677
Total remuneration (GCGC)	**461,304**	**3,418,328**	**1,618,328**	**5,218,328**	**0**	**1,276,295**	**644,733**	**1,907,857**

1) The bonus attributable to the Performance Share Plan and/or the long-term share price component is based on the fair value of the entitlement at grant date. Grant date for the 2018 tranche was 01/01/2018, with grant date for the 2019 tranche being 01/01/2019.
2) The amount of EUR 225,000 is a one-off lump sum payment granted to Stefan Klebert for the period commencing with his entry on November 15, 2018, to December 31, 2018; it represents the pro-rata variable target remuneration (EUR 225,000) awarded for the above period.

Benefits granted	Steffen Bersch				Niels Erik Olsen			
	Member of the Executive Board				Member of the Executive Board			
					Until 03/31/2019			
	2018	2019	Min. (2019)	Max. (2019)	2018	2019	Min. (2019)	Max. (2019)
Fixed remuneration	600,000	600,000	600,000	600,000	849,014[2]	212,253	212,253	212,253
Fringe benefits	17,547	109,098	109,098	109,098	54,834	50,278	50,278	50,278
Pension subsidies	7,254	7,477	7,477	7,477	0	0	0	0
Total non-performance-related components	**624,801**	**716,575**	**716,575**	**716,575**	**903,848**	**262,531**	**262,531**	**262,531**
One-year variable remuneration	**240,000**	**360,000**	**0**	**720,000**	**240,000**	**225,000**	**225,000**	**225,000**
Bonus (new remuneration system)	0	360,000	0	720,000	0	225,000[3]	225,000[3]	225,000[3]
Individual component (previous remuneration system)	240,000	0	0	0	240,000	0	0	0
Multi-year variable remuneration	**336,720**	**540,000**	**0**	**1,080,000**	**336,720**	**0**	**0**	**0**
Performance Share Plan (new remuneration system) (2019 tranche)[1]	0	540,000	0	1,080,000	0	0	0	0
Multi-year component (previous remuneration system)	240,000	0	0	0	240,000	0	0	0
Long-term share price component (previous remuneration system) (2018 tranche)[1]	96,720	0	0	0	96,720	0	0	0
Long-term share price component (previous remuneration system) (2019 tranche)[1]	0	0	0	0	0	0	0	0
Total performance-related components	**576,720**	**900,000**	**0**	**1,800,000**	**576,720**	**225,000**	**225,000**	**225,000**
Service cost	465,326	472,709	472,709	472,709	0	0	0	0
Total remuneration (GCGC)	**1,666,847**	**2,089,284**	**1,189,284**	**2,989,284**	**1,480,568**	**487,531**	**487,531**	**487,531**

1) The bonus attributable to the Performance Share Plan and/or the long-term share price component is based on the fair value of the entitlement at grant date. Grant date for the 2018 tranche was 01/01/2018, with grant date for the 2019 tranche being 01/01/2019.
2) The amount of EUR 849,014 comprises the annual fixed salary of EUR 600,000 and the annual compensation amount of EUR 249,014 granted to Niels Erik Olsen instead of pension benefits.
3) The amount of EUR 225,000 EUR represents Niels Erik Olsen's entitlements in relation to all bonus components for the period January 1, 2019, to his departure on March 31, 2019, which were computed on the basis of a 100 percent target achievement level.

Benefits granted	Martine Snels				Jürg Oleas			
	Member of the Executive Board				Member of the Executive Board			
	Until 12/31/2019				Until 02/17/2019			
	2018	2019	Min. 2019	Max. (2019)[2]	2018	2019	Min. 2019	Max. (2019)[2]
Fixed remuneration	600,000	600,000	600,000	600,000	1,250,000	167,411	167,411	167,411
Fringe benefits	42,355	34,725	34,725	34,725	33,541	5,779	5,779	5,779
Pension subsidies	0	0	0	0	0	0	0	0
Total non-performance-related components	**642,355**	**634,725**	**634,725**	**634,725**	**1,283,541**	**173,190**	**173,190**	**173,190**
One-year variable remuneration	**240,000**	**240,000**	**0**	**480,000**	**500,000**	**142,299**	**142,299**	**142,299**
Bonus (new remuneration system)	0	0	0	0	0	0	0	0
Individual component (previous remuneration system)	240,000	240,000	0	480,000	500,000	142,299[3]	142,299[3]	142,299[3]
Multi-year variable remuneration	**336,720**	**351,972**	**0**	**960,000**	**701,500**	**0**	**0**	**0**
Performance Share Plan (new remuneration system) (2019 tranche)[1]	0	0	0	0	0	0	0	0
Multi-year component (previous remuneration system)	240,000	240,000	0	600,000	500,000	0	0	0
Long-term share price component (previous remuneration system) (2018 tranche)[1]	96,720	0	0	0	201,500	0	0	0
Long-term share price component (previous remuneration system) (2019 tranche)[1]	0	111,972	0	360,000	0	0	0	0
Total performance-related components	**576,720**	**591,972**	**0**	**1,440,000**	**1,201,500**	**142,299**	**142,299**	**142,299**
Service cost	333,048	582,834[4]	582,834[4]	582,834[4]	500,468	76,200	76,200	76,200
Total remuneration (GCGC)	**1,552,123**	**1,809,531**	**1,217,559**	**2,657,559**	**2,985,509**	**391,689**	**391,689**	**391,689**

1) The bonus attributable to the Performance Share Plan and/or the long-term share price component is based on the fair value of the entitlement at grant date. Grant date for the 2018 tranche was 01/01/2018, with grant date for the 2019 tranche being 01/01/2019.
2) Not taking into account the possibility of granting a special discretionary bonus.
3) The amount of EUR 142,299 represents Jürg Oleas's entitlements in relation to all bonus components for the period January 1, 2019, to his departure on February 17, 2019, which were computed on the basis of an 85 percent target achievement level.
4) Apart from the contributions to the company pension scheme for fiscal year 2019 (EUR 333,048), the amount of EUR 582,834 also includes contributions in the amount of EUR 249,786 granted to Martine Snels in connection with her premature departure for the period January 1, 2020, to September 30, 2020; for further information see section on "Agreements governing the departure of former Executive Board members."

Benefits granted	Dr. Helmut Schmale			
	CFO			
	Until 05/17/2019			
	2018	2019	Min. (2019)	Max. (2019)[2]
Fixed remuneration	700,000	265,323	265,323	265,323
Fringe benefits	39,776	16,517	16,517	16,517
Pension subsidies	7,254	2,834	2,834	2,834
Total non-performance-related components	**747,030**	**284,674**	**284,674**	**284,674**
One-year variable remuneration	**280,000**	**225,521**	**225,521**	**225,521**
Bonus (new remuneration system)	0	0	0	0
Individual component (previous remuneration system)	280,000	225,521[3]	225,521[3]	225,521[3]
Multi-year variable remuneration	**392,840**	**0**	**0**	**0**
Performance Share Plan (new remuneration system) (2019 tranche)[1]	0	0	0	0
Multi-year component (previous remuneration system)	280,000	0	0	0
Long-term share price component (previous remuneration system) (2018 tranche)[1]	112,840	0	0	0
Long-term share price component (previous remuneration system) (2019 tranche)[1]	0	0	0	0
Total performance-related components	**672,840**	**225,521**	**225,521**	**225,521**
Service cost	184,331	0	0	0
Total remuneration (GCGC)	**1,604,201**	**510,195**	**510,195**	**510,195**

1) The bonus attributable to the Performance Share Plan and/or the long-term share price component is based on the fair value of the entitlement at grant date. Grant date for the 2018 tranche was 01/01/2018, with grant date for the 2019 tranche being 01/01/2019.
2) Not taking into account the possibility of granting a special discretionary bonus.
3) The amount of EUR 225,521 represents Dr. Helmut Schmale's entitlements in relation to all bonus components for the period January 1, 2019, to his departure on May 17, 2019, which were computed on the basis of an 85 percent target achievement level.

Model table 2 referring to section 4.2.5 para. 3 (2nd indent) GCGC "Benefits received for the reporting period"

Benefits received	Stefan Klebert		Marcus A. Ketter	
	CEO		CFO	
			As of 05/ 20/2019	
	2018	2019	2018	2019
Fixed remuneration	150,000	1,200,000	0	418,602
Fringe benefits	36,304	18,328	0	41,454
Pension subsidies	0	0	0	0
Total non-performance-related components	**186,304**	**1,218,328**	**0**	**460,056**
One-year variable remuneration	**225,000**	**1,132,661**	**0**	**398,933**
Bonus (new remuneration system)	0	1,132,661	0	398,933
Individual component (previous remuneration system)	225,000*	0	0	0
Multi-year variable remuneration	**0**	**0**	**0**	**0**
Multi-year component (previous remuneration system)	0	0	0	0
Long-term share price component (previous remuneration system) (2016 tranche)	0	0	0	0
Long-term share price component (previous remuneration system) (2015 tranche)	0	0	0	0
Total performance-related components	**225,000**	**1,132,661**	**0**	**398,933**
Service cost	50,000	400,000	0	184,677
Total remuneration (GCGC)	**461,304**	**2,750,989**	**0**	**1,043,667**

*) The amount of EUR 225,000 is a one-off lump sum payment granted to Stefan Klebert for the period commencing with his entry on November 15, 2018, to December 31, 2018; it represents the pro-rata variable target remuneration (EUR 225,000) awarded for the above period.

Benefits received	Steffen Bersch		Niels Erik Olsen	
	Member of the Executive Board		Member of the Executive Board	
			Until 03/31/2019	
	2018	2019	2018	2019
Fixed remuneration	600,000	600,000	849,014	212,253
Fringe benefits	17,547	109,098	54,834	50,278
Pension subsidies	7,254	7,477	0	0
Total non-performance-related components	**624,801**	**716,575**	**903,848**	**262,531**
One-year variable remuneration	**279,600**	**542,234**	**249,600**	**225,000**
Bonus (new remuneration system)	0	542,234	0	225,000*
Individual component (previous remuneration system)	279,600	0	249,600	0
Multi-year variable remuneration	**73,440**	**26,106**	**73,440**	**26,106**
Multi-year component (previous remuneration system)	73,440	0	73,440	0
Long-term share price component (previous remuneration system) (2016 tranche)	0	26,106	0	26,106
Long-term share price component (previous remuneration system) (2015 tranche)	0	0	0	0
Total performance-related components	**353,040**	**568,340**	**323,040**	**251,106**
Service cost	465,326	472,709	0	0
Total remuneration (GCGC)	**1,443,167**	**1,757,624**	**1,226,888**	**513,637**

*) The amount of EUR 225,000 EUR represents Niels Erik Olsen's entitlements in relation to all bonus components for the period January 1, 2019, to his departure on March 31, 2019, which were computed on the basis of a 100 percent target achievement level.

Benefits received	Martine Snels		Jürg Oleas	
	Member of the Executive Board		CEO	
	Until 12/31/2019		Until 02/17/2019	
	2018	2019	2018	2019
Fixed remuneration	600,000	600,000	1,250,000	167,411
Fringe benefits	42,355	34,725	33,541	5,779
Pension subsidies	0	0	0	0
Total non-performance-related components	**642,355**	**634,725**	**1,283,541**	**173,190**
One-year variable remuneration	**283,920**	**277,920**	**475,500**	**142,299**
Bonus (new remuneration system)	0	0	0	0
Individual component (previous remuneration system)	283,920	277,920	475,500	142,299[2]
Multi-year variable remuneration	**73,440**	**46,080**	**312,250**	**57,250**
Multi-year component (previous remuneration system)	73,440	46,080	153,000	0
Long-term share price component (previous remuneration system) (2016 tranche)	0	0	0	57,250
Long-term share price component (previous remuneration system) (2015 tranche)	0	0	159,250	0
Total performance-related components	**357,360**	**324,000**	**787,750**	**199,549**
Service cost	333,048	582,834[1]	500,468	76,200
Total remuneration (DCGK)	**1,332,763**	**1,541,559**	**2,571,759**	**448,939**

1) Apart from the contributions to the company pension scheme for fiscal year 2019 (EUR 333,048), the amount of EUR 582,834 also includes contributions in the amount of EUR 249,786 granted to Martine Snels in connection with her premature departure for the period January 1, 2020, to September 30, 2020; for further information see section on “Agreements governing the departure of former Executive Board members.”
2) The amount of EUR 142,299 represents Jürg Oleas’s entitlements in relation to all bonus components for the period January 1, 2019, to his departure on February 17, 2019, which were computed on the basis of an 85 percent target achievement level.

Benefits received	Dr. Helmut Schmale		Dr. Stephan Petri	
	CFO		Member of the Executive Board	
	Until 05/17/2019		Until 06/30/2016	
	2018	2019	2018	2019
Fixed remuneration	700,000	265,323	0	0
Fringe benefits	39,776	16,517	0	0
Pension subsidies	7,254	2,834	0	0
Total non-performance-related components	**747,030**	**284,674**	**0**	**0**
One-year variable remuneration	**269,080**	**225,521**	**0**	**0**
Bonus (new remuneration system)	0	0	0	0
Individual component (previous remuneration system	269,080	225,521[1]	0	0
Multi-year variable remuneration	**174,064**	**32,060**	**315,833**	**0**
Multi-year component (previous remuneration system)	85,680	0	0	0
Long-term share price component (previous remuneration system) (2016 tranche)	0	32,060	57,000[2]	0
Long-term share price component (previous remuneration system) (2015 tranche)	88,384	0	112,333[2]	0
Long-term share price component (previous remuneration system) (2014 tranche)	0	0	146,550[2]	
Total performance-related components	**443,144**	**257,581**	**315,883**	**0**
Service cost	184,331	0	0	0
Total remuneration (GCGC)	**1,374,505**	**542,255**	**315,883**	**0**

1) The amount of EUR 225,521 represents Dr. Helmut Schmale’s entitlements in relation to all bonus components for the period January 1, 2019, to his departure on May 17, 2019, which were computed on the basis of an 85 percent target achievement level.
2) As agreed, the variable remuneration components earned by the time of his departure were uniformly paid out on March 31, 2018, to the former Executive Board member Dr. Stephan Petri, who had left the company on June 30, 2016. In relation to the long-term share price component, this includes the tranches for 2014, 2015 and 2016. While the 2014 tranche would normally have been paid out in fiscal year 2017, the 2016 tranche would normally not have been disbursed until the 2019 fiscal year.

Benefits received	Markus Hüllmann	
	Member of the Executive Board	
	Until 12/31/2015	
	2018	2019
Fixed remuneration	0	0
Fringe benefits	0	0
Pension subsidies	0	0
Total non-performance-related components	**0**	**0**
One-year variable remuneration	**0**	**0**
Bonus (new remuneration system))		
Individual component (previous remuneration system	0	0
Multi-year variable remuneration	**70,070**	**0**
Multi-year component (previous remuneration system)	0	0
Long-term share price component (previous remuneration system) (2016 tranche)	0	0
Long-term share price component (previous remuneration system) (2015 tranche)	70,070	0
Total performance-related components	**70,070**	**0**
Service cost	0	0
Total remuneration (GCGC)	**70,070**	**0**

Remuneration of former Executive Board members and their surviving dependents

In the fiscal year, former Executive Board members and their surviving dependents received remuneration of EUR 11,377 thousand from the GEA Group in 2019, of which EUR 4,708 thousand was pension payments (previous year: EUR 4,623 thousand) and EUR 6,669 thousand was severance payments for Executive Board members who left in 2019, which are explained in detail in the remuneration report. The GEA Group formed pension provisions (gross value) of EUR 100,697 thousand (previous year: EUR 82,945 thousand) as of December 31, 2019, for former Executive Board members and their surviving dependents, including those who left the Executive Board during the year.

Remuneration of the Supervisory Board members

The remuneration of the Supervisory Board members is a purely fixed compensation. It does not include any performance-related component.

In the year under review, the expenses incurred for the Supervisory Board amounted to EUR 1,389 thousand (previous year: EUR 1,276 thousand). Pursuant to s. 15 para. 1 of the Articles of Association, each member of the Supervisory Board receives a fixed annual remuneration of EUR 50 thousand payable after the end of each fiscal year, in addition to the reimbursement of their expenses. The Chairman of the Supervisory Board receives two and a half times, his deputy one and a half times this amount. In accordance with s. 15 para. 2 of the Articles of Association, members of the Presiding Committee and the Audit Committee each receive an additional EUR 35 thousand. In accordance with s. 15 para. 2, the members of the Technology Committee receive an additional EUR 25 thousand each. The chair of each committee receives twice the respective amount. No separate remuneration is paid to members of the Mediation Committee and the Nomination Committee. Pursuant to s. 15 para. 5, the members of the Technology Committee are entitled to receive a remuneration in the amount stated in para. 2 (as amended) from fiscal year 2019 onwards. Members who join or leave the Supervisory Board and/or its committees during the year only receive a pro rata amount for the period of their membership. After the end of the fiscal year - pursuant to s. 15 para. 3 of the Articles of Association – the Supervisory Board members also receive an attendance fee of EUR 1 thousand for each meeting of the Supervisory Board, the Presiding Committee, the Audit Committee or the Technology Committee they have attended. In fiscal year 2019, the Supervisory Board held seven meetings, the Presiding Committee met six times, the Audit Committee convened on five occasions while the Technology Committee met twice.

The following table shows the individual breakdown of the remuneration and its respective components awarded for membership in the Supervisory Board and/or the Presiding Committee, the Audit Committee and the Technology Committee in 2019 compared with the previous year:

(in EUR)	Supervisory Board remuneration	Presiding Committee remuneration	Audit Committee remuneration	Technology Committee remuneration	Attendance fee	**Total**
Dr. Perlet	125,000	70,000	35,000	–	18,000	**248,000**
Previous year	125,000	70,000	35,000	–	21,000	**251,000**
Löw*	75,000	35,000	–	–	13,000	**123,000**
Previous year	75,000	35,000	–	–	16,000	**126,000**
Bastaki	50,000	35,000	–	–	12,000	**97,000**
Previous year	50,000	35,000	–	–	12,000	**97,000**
Prof. Dr. Bauer (until November 12, 2018)	–	–	–	–	–	**–**
Previous year	43,288	30,301	–	–	13,000	**86,589**
Eberlein	50,000	–	70,000	–	12,000	**132,000**
Previous year	50,000	–	70,000	–	14,000	**134,000**
Gröbel*	50,000	35,000	–	–	13,000	**98,000**
Previous year	50,000	35,000	–	–	16,000	**101,000**
Hall	50,000	35,000	–	–	12,000	**97,000**
Previous year	6,712	1,247	–	–	3,000	**10,959**
Hubert*	50,000	35,000	–	25,000	15,000	**125,000**
Previous year	50,000	35,000	–	–	16,000	**101,000**
Kämpfert	50,000	–	35,000	–	12,000	**97,000**
Previous year	50,000	–	35,000	–	13,000	**98,000**
Kerkemeier*	50,000	–	–	–	6,000	**56,000**
Previous year	50,000	–	–	–	7,000	**57,000**
Krönchen*	50,000	–	35,000	25,000	14,000	**124,000**
Previous year	50,000	–	35,000	–	13,000	**98,000**
Spence	50,000	–	–	25,000	8,000	**83,000**
Previous year	50,000	–	–	–	8,000	**58,000**
Dr. Zhang	50,000	–	–	50,000	9,000	**109,000**
Previous year	50,000	–	–	–	7,000	**57,000**
Total	**700,000**	**245,000**	**175,000**	**125,000**	**144,000**	**1,389,000**
Previous year	**700,000**	**241,548**	**175,000**	**–**	**159,000**	**1,275,548**

*) The company and the external employee representatives remit their respective remuneration to the Hans Böckler Foundation in accordance with applicable guidelines.

Sustainability at GEA

About non-financial reporting

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Information provided in the context of non-financial reporting that is not marked as part of the non-financial statement is not subject to the substantive audit by the independent auditor.

From fiscal year 2016 onwards, GEA has regularly analyzed a specific range of topics relevant to its approach to sustainability and pertinent to reporting in this field. Based on this analysis, the company has derived a set of topics that are regarded as essential by its internal and external stakeholders. Once again, GEA's sustainability report for the 2019 fiscal year is in line with the international standards set by the Global Reporting Initiative (GRI). The report has been prepared according to the "core option" of the GRI Standards.

In 2019, GEA once again thoroughly reviewed and defined the delineation of the individual topics and the respective reporting boundaries. On the whole, the materiality analysis conducted in the previous year still holds true, with a few priorities being changed and some subject areas being merged for the sake of reporting clarity. Pursuant to section 315b (3) sentence 1 HGB (Handelsgesetzbuch – German Commercial Code), the combined "consolidated non-financial statement" forms part of this sustainability report. The subject-matters addressed in this statement are marked "NFS" (non-financial statement) by a line in the margin. For the purpose of ascertaining the topics to be reported in the non-financial statement and pursuant to s. 315c in conjunction with s. 289c (3) HGB, GEA has also taken into consideration whether a specific topic is required for understanding GEA's business progress, business results as well as the situation of the company (net assets, financial position, result of operations). Moreover, disclosures allowing people to gain an understanding of the impact of the company's activities must be provided in relation to the respective topics. The following topics meet these requirements:

- Greenhouse gas emissions
- Sustainable engineering
- Health and safety at work
- Protection of personal data
- Compliance, in particular anti-corruption

For GEA, respect for human rights is the basis of its business activities and an indispensable part of its self-image. As the issue is not material in the sense of the HGB criteria, compliance with human rights is reported in detail in accordance with the GRI standards. The respective details are outlined in the materiality analysis on page 116 as well as the reporting profile on page 149 ff.

In accordance with s. 315c (1) in conjunction with s. 289c (1) HGB, GEA's business model is described in the corresponding paragraph of the Group Management Report in the section on "Fundamental Information about the Group" on pages 36 ff. This also forms part of GEA's non-financial statement.

Under s. 315c in conjunction with s. 289c (3) no. 3 and 4 HGB, GEA is obligated to report on all known material risks associated with its own business activities, business relations as well as its products and services if the latter are highly likely to have or will have a severe adverse impact on non-financial aspects. No such risks have been ascertained.

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Non-financial reporting comprises all topics GEA regards as material in terms of the GRI Materiality Analysis; sections of the report that fail to carry a specific NFS mark do not form part of the non-financial statement in accordance with s. 315c in conjunction with s. 289c HGB.

The subjects covered by non-financial reporting are based on an analysis of the management systems and the data provided by the operational units and competent departments in the Global Corporate Center. The GRI Content Index is included at the end of the Annual Report (see page 289 ff.). The contribution of GEA to the Sustainable Development Goals (SDG) is shown in a reconciliation to the GRI standards on page 295 ff., immediately following the GRI Content Index.

Non-financial reporting comprises the following sections:

- Sustainability management at GEA
- Responsibility for quality, health, safety and the environment
- Sustainable engineering
- Social responsibility for employees
- Human rights
- Responsible value creation
- Reporting profile

Materiality analysis 2019

Matters according to the EU CSR Directive	Allocation of relevant fields of action to specific matters	Relevant fields of action	Non-financial statement
Environmental matters			
	• •	Greenhouse gas emissions	Greenhouse gas emissions
	• • •	Responsible supply chain	
	• •	Sustainable engineering	Sustainable engineering
Employee-related matters			
	• •	Employment	
	• •	Health and safety at work	Health and safety at work
	• •	Socio-economic compliance including protection of personal data	Protection of personal data
Diversity concept*			
	• •	Diversity and equal opportunities	
Social matters			
	•	Procurement	
Respect for human rights			
	• • • •	Social assessment of suppliers	
Anti-corruption and bribery matters			
	•	Compliance, in particular fight against corruption	Compliance, in particular fight against corruption

• Environmental matters • Employee-related matters • Diversity concept • Social matters • Respect for human rights • Anti-corruption and bribery matters

*) Encompasses board and senior management diversity as well as total workforce diversity; for more information on the diversity concept, see Corporate Governance Report including Corporate Governance Statement.

Sustainability management at GEA

By adopting the policy of "Sustainable Value Creation at GEA," the Executive Board defined the group's ambitions and targets in terms of sustainability, incorporating them into GEA's values. This has given rise to a strategic vision that applies worldwide. The respective document is available on the company's website at gea.com.

Basic principles

GEA's Code of Conduct (see page 147) outlines the values, principles and procedures underlying and guiding GEA's corporate behavior. This Code of Conduct reflects the company's objective to ensure corporate-wide compliance with standards while creating a work environment that rewards integrity, respect as well as fair and responsible conduct. It applies to all GEA employees and bodies worldwide.

The Code of Corporate Responsibility (see page 143 f.) encompasses both ethical and legal standards that are binding on all group employees worldwide. As a successful international engineering group with more than 18,000 employees and operations in over 50 different countries, GEA has committed to international fair trade as a key prerequisite to global economic growth. GEA fully recognizes the "Guidance on social responsibility " (ISO 26000) and aligns all its actions with the basic principles of social responsibility as well as the core topics set forth therein.

The Code of Conduct for Suppliers and Subcontractors (see page 145 f.) sets forth GEA's basic principles and requirements that are to be met by all suppliers of goods and services, their subcontractors as well as the group entities of the suppliers and subcontractors with regard to their responsibility towards society, the environment and the individuals involved in the production of goods and/or the rendering of services.

In 2019, responsibility for sustainability within the company's organizational structure was clearly allocated. Hence, QHSE (Quality, Health, Safety & Environment) now also encompasses the newly created department for "Corporate Responsibility" (new name: CR&QHSE). There is a direct reporting line to the Executive Board of GEA Group Aktiengesellschaft. Sustainability targets are an integral part of the remuneration system of the Executive Board of GEA Group Aktiengesellschaft.

CSR rating

For ensuring maximum transparency in the markets, GEA – inter alia – participates in the annual EcoVadis CSR performance monitoring scheme. EcoVadis represents the technical platform used for the audit program of the TfS initiative ("Together for Sustainability"), which was initiated by six multinational chemical companies back in 2011. It pursues the objective of facilitating the audit process for international companies by collecting documented answers via a standardized questionnaire and having them analyzed and assessed by neutral auditors. According to EcoVadis, the procurement and CSR experts from more than 450 leading multinational corporations worldwide currently rely on the CSR ratings provided by this platform. Every year, GEA participates in the EcoVadis audit to document its progress. In 2019, GEA continued to improve its EcoVadis CSR rating, remaining at "Silver" by scoring 60 points (2018: "Silver" with 59 points).

Responsibility for quality, health, safety and the environment

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Common management approach to quality, health, safety at work and the environment

Health and safety at work, sustainable value creation as well as the recognition of the Guidance on Social Responsibility (ISO 26000) represent the cornerstones of GEA's Code of Corporate Responsibility, which was jointly overhauled by the Executive Board, the Group Works Council as well as the European Works Council in March 2019. Following consultations with the competent employee representative bodies, GEA's Executive Board once again revised the company's "Quality, Health, Safety & Environment (QHSE) Policy" in August 2019, committing to continuing a clear policy in terms of quality, health, safety and the environment. The latter applies throughout the group and comprises the following points:

- Identification, analysis and efficient management of all quality, health, safety and environmental risks and opportunities that occur within the framework of business activities
- Compliance with all legal and industry-specific requirements, applicable rules and regulations as well as national standards
- Integration of quality and HSE into the company's business strategy and day-to-day processes in a dialogue with business partners and further stakeholders
- Active involvement of the workforce in decision-making processes by cooperating and communicating on a basis of mutual trust
- Permanent monitoring and improvement of the QHSE systems, performance and impact by assessing GEA's objectives for implementing adequate, sustainable corrective and preventive measures
- Further development of safe, high-quality and environmentally compatible products and services to safeguard and continuously enhance customer satisfaction and the company's footprint in the market
- Further development of safe, efficient and environmentally compatible technologies, tools and methods
- Creation and continuous further development of a safe and healthy working environment for all employees, business partners and third parties to prevent occupational accidents and diseases
- Definition and active pursuit of measures designed to prevent incidents and appropriately manage emergencies, incidents and their respective fallout
- Advancement and expansion of the GEA Care healthcare management program
- Launch of new schemes designed to prevent occupational diseases
- Prevention of environmental incidents and pollution
- Reduction in CO_2 emissions and waste
- Further development of resource efficient products and services
- Responsible use of natural resources by involving business partners and further stakeholders
- Promotion of sustainable and responsible procurement while avoiding the purchase of conflict minerals from conflict regions

GEA communicates these corporate standards to all individuals acting for or on behalf of the company, actively involving them in the implementation of this policy. The latter is displayed at all sites and made publicly available on the corporate website at gea.com. On a regular basis, the CR&QHSE management delivers reports on all these matters to the Group Works Council as well as the European Works Council, where they coordinate actions with the employee representatives.

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Derived from the above QHSE Policy, the company once again defined and set tangible targets in and for fiscal year 2019, with the respective target achievement levels being assessed in comparison with the previous year's results (see gea.com), including:

- Recertification of GEA's umbrella certificate for four management systems
- Conversion of BS OHSAS 18001 into ISO 45001
- Zero accidents
- Lost Day Frequency Rate ≤ 6.0
- Lost Day Severity Rate ≤ 120
- Proactive Injury Rate (PAIR) ≥ 65
- Continuous reduction in CO_2 emissions by 1.5 percent p.a.

For more information on target achievement levels see page 119 f., 121 f. and 125 f. of the report.

In organizational terms, QR&QHSE is firmly embedded in all areas of the company and comprises three levels of responsibility.

- The central governance function directly reports to GEA's Executive Board. The CR&QHSE governance team devises the global QHSE strategy as well as the corresponding targets and makes available general policies and reports. It defines the management system while establishing and supporting the implementation of and compliance with the statutory and individual requirements set by investors, customers and external stakeholders.
- The excellence level embraces various functions and is divided into production, project implementation and service. The respective teams provide technical assistance to the organization while supporting it by issuing functional policies and delivering training.
- On the third level of responsibility, the Regions and Countries implement policies and programs on a local level. Due to legal or cultural differences between the various sites, it is imperative to have a central QHSE contact in each region to be able to share know-how, give feedback and respond to local requirements in a timely fashion.

Certification of the management systems

As early as 2016, GEA started clustering its sites with integrated management systems under the umbrella of a unified GEA certificate. GEA Group Aktiengesellschaft, headquartered in Düsseldorf, is certified to ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 as well as ISO 50001:2011 and, thus, heads the group of certified sites.

In the year under review, the umbrella certificate was up for renewal, a procedure that is required every three years. In this context, a total of 14 companies were audited, with the umbrella certificate being successfully renewed. In addition, all certifications to BS OHSAS 18001 were switched to the new ISO 45001 standard in line with the set target.

Step by step, additional GEA companies are being integrated into the umbrella certificate, with the company seeking to cover the entire range of production and service sites with the three management systems ISO 9001, ISO 14001 and ISO 45001 by 2025. Integration priority is subject to the expiry dates of the respective certificates awarded. In the year under review, two companies were integrated into the umbrella certificate. The number of certificates is still declining, for instance due to the fact that some sites were merged and not all sites continue to hold all certificates as before. On the other hand, further sites were certified to health and safety as well as environmental management systems.

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In 2019, the status quo of certifications within the group was as follows:

Management system	Number of certificates 2019 ✓	Number of certificates 2018 ✓	Number of certificates under umbrella certificate 2019 ✓	Number of certificates under umbrella certificate 2018 ✓	Covered by umbrella certificate 2019 (in %)
DIN EN ISO 9001:2015	89	105	67	86	75
DIN EN ISO 14001:2015	38	30	18	17	47
BS OHSAS 18001:2007	–	25	–	12	–
DIN EN ISO 45001:2018	30	–	14	–	47
DIN EN ISO 50001:2011	16	17	4	5	25

✓ Audited by KPMG

ISO 9001 defines the minimum requirements to be met by the quality management system of an organization allowing the latter to provide products and services that fulfill customer expectations and comply with regulatory requirements. At the same time, the management system is to be subject to a continuous improvement process.

The international environmental management standard **ISO 14001** stipulates the requirements to be met by an environmental management system and forms part of the family of standards applicable to environmental management

ISO 45001 represents a standard published by the International Organization for Standardization (ISO) in March 2018 that outlines requirements to be met by an occupational health and safety management system (OHSMS) as well as guidance on implementation. ISO 45001 takes the place of the Occupational Health and Safety Assessment Series (OHSAS 18001). Previously, **BS OHSAS 18001** used to be the internationally accepted basis for management systems in the field of occupational health and safety.

ISO 50001 governs the establishment of a corporate energy management system for the purpose of increasing energy efficiency in the long run.

Quality and processes

The “Process Description and Procedure Platform“, the PPP for short, centrally incorporates business processes and procedural instructions governing GEA’s functioning. Its objective is to provide an overview of centralized and local processes while making them accessible to all employees. In this context, an automated approval workflow ensures that the created processes are approved pursuant to the respective roles and responsibilities, with an automated reminder function also making sure that the contents are regularly checked for updates. Being available to all GEA employees, the online platform with its documents is fed with processes and related templates by the competent organizational units throughout the entire group. This is where roles and responsibilities, such as internal approval processes, are clearly defined and converted into automated processes. In 2019, the number of available documents went up, with the number of individuals accessing the platform remaining high at a stable level.

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Health and safety at work

A healthy and safe working environment constitutes a recognized human right and also embraces one of the Sustainable Development Goals defined by the United Nations. GEA gives top priority to occupational health and safety. Above and beyond legal requirements, GEA feels obligated to protect its own employees, individuals whose workplaces are controlled by GEA or who work on behalf of GEA as well as the people working for customers and suppliers, if possible and within reason. Within the framework of GEA’s QHSE organization, the excellence level makes sure that contracts concluded with customers and suppliers/subcontractors are in line with the standards set by GEA and include relevant clauses on occupational health and safety as well as the related procedures, with the governance function establishing the respective standard processes.

GEA regards accidents and health hazards affecting the workforce as well as the respective absenteeism, damage to the company’s image and potential penalties or indemnity payments arising therefrom as unacceptable. Thus, the company pursues a clear zero-accident strategy. Its risk management concept applies to all GEA sites worldwide and includes the regular systematic identification and assessment of risks performed on the basis of established procedures; for instance, each GEA company is obliged to conduct a risk assessment. The respective health and safety experts in the companies advise the management teams on the status of occupational health and safety, improvement measures, the occupational health and safety organization, accident statistics as well as the required personal protection equipment. Moreover, risks are also managed by means of certifying the sites to ISO 45001 (see overview

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and number of certifications, page 119 f.), setting clear QHSE Policy targets and continuously enhancing regional QHSE organizations. At GEA sites, occupational health services are available to both employees as well as any external staff working there; the confidentiality of medical data is guaranteed. Reviews take place via internal HSE audits, risk assessments as well as psychological risk assessments performed within the framework of the company's health management scheme. Amongst other things, the QHSE targets set for 2019 include the reduction in accidents and the group-wide expansion of the health management scheme until 2025 (see gea.com).

While expanding its global QHSE organization, GEA further specified responsibilities in the year under review. In doing so, the company refined the relevant key performance indicators and enhanced data quality. Since last year, workplace accidents and lost time can also be differentiated in terms of the place where the accident occurred: at a GEA production site, when performing service activities or projects while being with a customer or in the office. For the first time, the year under review saw a consolidation of all figures by site and no longer by company.

In order to be able to more specifically address the causes of accidents, the company also started capturing information on the respective body parts affected. This new analysis provides more detailed information and supports the global HSE team in further reducing the number of accidents.

For instance, employee training on occupational health and safety in Germany mainly takes place within the framework of the statutory annual UVV training courses. UVV stands for the accident prevention rules and regulations ("Unfallverhütungsvorschriften") issued by the German workers' compensation boards ("Berufsgenossenschaften") that set forth the processes established for safely operating and handling technical equipment and supplies. These accident prevention rules and regulations represent the obligations governing health and safety in the workplace that are binding on all enterprises and insured individuals. Translated into 14 different languages, the "GEA Safety Core Rules" apply worldwide and serve as minimum standards as far as occupational health and safety are concerned. They are available in the GEA Learning Center in the form of online training courses and videos. Moreover, there are briefings and checklists for specific hazardous activities or tools, for instance the use of forklift trucks. Country-specific training courses in line with the respective rules and regulations are within the remit of the local managing directors or site managers.

Compared with the previous year, the number of accidents saw a significant decline (–4.5 percent). With approximately the same number of hours worked, GEA's 2019 Lost Day Frequency Rate went down to 5.68 (previous year: 5.97) accidents per million hours worked. In the year under review, a total of 232 accidents (previous year: 243) were reported, with 264 sites – i.e., 76 percent of the 346 GEA sites included in the survey – remaining accident-free (previous year: 60 percent). 2019 was another year without fatal workplace accidents. Nonetheless, the Lost Day Severity Rate in the wake of accidents went up to 127.44 days lost per million hours worked (previous year: 117.58). This implies that, overall, accidents entailed longer periods of absence. However, this does not apply to production: This area experienced a continuation of the favorable trend, with the Lost Day Severity Rate witnessing a gratifying decrease of nearly 24 percent. As outlined above, the company's 2019 objectives for health and safety at work (Lost Day Frequency Rate < 6.0, Lost Day Severity Rate < 120) were only partly accomplished. For this reason, Service has planned to take tangible measures for reducing accident severity in 2020.

The company will continue to consistently implement its precautionary approach in the field of occupational health and safety: For the purpose of detecting potential risks and hazards early on and for preventing accidents, GEA has recorded and analyzed near misses worldwide since 2017. Just like real accidents, GEA also subjects near misses to an analysis that entails a targeted follow-up process with defined responsibilities and a specific set of actions. This approach pays off and is conducive to accomplishing the zero-accident target.

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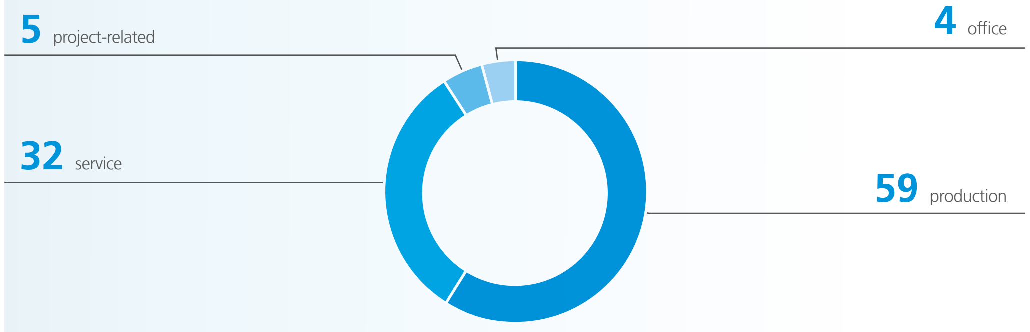
Key performance indicators for occupational safety	2019 ✓	2018 ✓	2017 ✓
Number of workplace accidents	232	243	242
Number of days lost	5,202	4,786	6,716
Lost Day Frequency Rate[1]	5.68	5.97	6.18
Lost Day Severity Rate[2]	127.44	117.58	172.18
Near misses (Proactive Injury Rate, PAIR)[3]	128.71	145.76	97.06
Total Injury Rate, TIR[3]	33.46	37.88	45.18
Accident-free sites, as a percentage of all sites	76	60	53

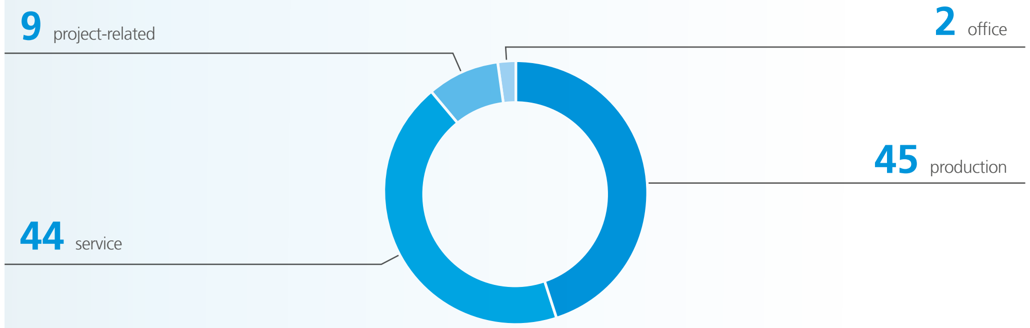
✓ Audited by KPMG

1) Accident frequency: Lost time injuries per million hours worked; since 2018, GEA has counted periods of absence of up to 182 days pursuant to the European Statistics for Accidents at Work (ESAW); before, the relevant number of days was 365
2) Accident severity: Days lost after accidents per million hours worked; since 2018, GEA has counted periods of absence of up to 182 days pursuant to ESAW; before, the relevant number of days was 365
3) per million hours worked

Workplace accidents by place of performance
(in %)



Days lost by place of performance
(in %)



Internal HSE legal compliance audits

Compliance with local statutory rules and regulations applicable to health, safety and the environment is regularly reviewed by means of audits that are conducted by an external service provider commissioned by the Executive Board. The reports are uniform and compiled on the basis of a set of 25 criteria, with all observations and recommendations being entered into a software that is available throughout the group. Proceeding this way brings to light necessary areas for improvement, and those responsible on a local level have the possibility of directly documenting their corrective actions in the system. The respective organization undertakes to implement these corrective measures in the long run, with the entire process being tracked and validated by the responsible QHSE officers of the country and excellence functions. The improvement process is not completed until the QHSE governance function has given its final approval.

Health management

GEA intends to further expand its GEA Care health management scheme. For instance, as part of a group-wide program, GEA plans to offer stress management and mindfulness training to employees exposed to particular levels of stress and strain.

Currently, a dedicated system covering all sites worldwide checks which measures are mandatory under (national) law and which are desirable from a local perspective. On-site offerings under local responsibility will be incorporated into the final design of the company's health management scheme, since local independence and, in particular, successfully established offerings are to be encouraged and promoted.

Finally, GEA Care is to be fully developed by 2025 on the basis of local and global offerings that may be accessed via the intranet for the purpose of making online offers directly available to every employee, on the one hand, while providing more transparency regarding local offerings on the other hand. This allows the various sites to mutually benefit from the experience gained by others.

Managing serious incidents, learning process

Serious incidents such as fatal and severe accidents, fires and explosions as well as environmental and security incidents are reported to the competent employees within the organization by means of the "Serious Events Reporting System." The latter also captures accidents sustained by individuals not employed with the company, but whose work and/or workplace is nonetheless controlled by GEA. This allows GEA to respond as quickly as possible to such events, minimize their impact and promptly initiate probes into the respective incidents. Afterwards, a dedicated lessons-learned process is started; its findings are also used proactively to prevent risks, identify measures for improvement and communicate them to the organization. This reporting system also includes incidents connected to GEA products and plants. Such incidents are recorded and investigated, regardless of whether the incident was caused by one of GEA's products or plants (for 'Sustainable engineering', see page 129 ff.). For this purpose, a group-wide reporting platform ensuring that the defined reporting channels are observed is in place.

Security management

GEA also fulfils its duty of care to its employees by providing a comprehensive security management. The "Major Incident Management Manual," for instance, outlines the procedures to be taken in the event of risky incidents that may have a potential impact on GEA's security, operations or reputation or affect the security, safety, health and life of its employees or other stakeholders.

GEA's Security Management provides a comprehensive and reliable service to employees who set off on worldwide business trips on behalf of GEA, even prior to their respective departure. This includes detailed risk assessments as well as travel and security information for every region around the globe. Since 2019, GEA has been a member of the ASW West association (Allianz für Sicherheit in der Wirtschaft West e.V. – German Association for Security in Industry and Commerce West reg. soc.), which offers a cross-sectoral platform for exchanging information on security challenges; in the same year, the company also joined the Global Player Initiative of the Federal Criminal Police Office (Bundeskriminalamt – BKA), which not only provides a direct single point of contact at the BKA, but also promotes the exchange of information between major German companies up to actual cooperation in case of a crisis.

Early on, preventive measures may be discussed and planned while preparing for a business trip. Particularly vulnerable groups (service and sales staff, employees assigned to major projects and construction sites in high risk third countries) are offered specific training.

Providing regular updates on the intranet, GEA's Security Management ensures that all employees receive information on and are granted access to all services on offer.

Should an employee nonetheless get caught up in an emergency while he or she is away on business, they can contact the 24/7 "GEA Security and Support Hotline:" In the event of health-related issues, the company's "Medical Support Service Hotline" provides assistance and ensures appropriate medical care or even repatriation, if required. Via a voluntary security app on their mobile device, GEA employees may also obtain medical and security-related information about a group site at any time or directly contact the 24-hour hotline at GEA's Security Center. If employees have booked their business trip via the "GEA Travel Center," they can be tracked anywhere in the world by means of the so-called "travel tracker" on the proviso that they have given their prior consent. In the event of crises like natural disasters or political unrest, GEA's Security Management may, thus, quickly intervene and get in touch with the travelers in question. This way, GEA covered 13,749 travelers (counted individually per quarter) on 66,469 business trips in 2019. The company's Security Management stepped in on 44 occasions, while the provision of information and advice on security relevant matters was sufficient in 20 other cases.

In addition, 2019 saw the expansion and improvement of the company's internal crisis management scheme; a full-day series of lectures involving GEA top executives, senior officers from the Federal Criminal Police Office as well as consultants (amongst them a former kidnap victim) took place in autumn 2019 as a training measure for the crisis management team that is provided for in the Major Incident Management Manual. An exercise for this "Incident Management Team" is scheduled for the year 2020.

Environmental management

GEA's products and services support the customers in making their business processes more efficient and environmentally compatible. Apart from that, GEA also makes sure to mitigate adverse environmental impacts when it comes to its own business activities (see "Common management approach to quality, health, safety and the environment," page 118 f.). Specific targets and programs are individually defined by the respective sites in line with GEA's overarching QHSE Policy and global QHSE targets. For this purpose, GEA has also defined five simple environmental core rules ("core rules") that are explained in a practical manner and accompanied by implementation guidelines:

- Avoid unnecessary energy consumption
- Avoid unnecessary water consumption
- Keep waste generation to a minimum
- Avoid or reduce emissions
- Adequately and promptly respond to adverse environmental effects.

For information on sustainable engineering, see page 129 ff.; for risks and opportunities from climate change, see page 130; for details on product life cycle considerations, see page 134, and for water and waste, see page 126 ff.

Greenhouse gas emissions

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As in the previous years, GEA also took part in the survey conducted within the framework of the Carbon Disclosure Project (CDP) in 2019, achieving its best-ever result. The CDP is an independent, not-for-profit organization that currently represents more than 500 institutional investors. Each year, it gathers information on the specific greenhouse gas emissions of the

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major listed corporations and their strategies to combat climate change. The results are then made available to current and potential investors. Within the framework of this survey, GEA regularly provides information on the organizational setup, global targets, policies and programs, the risks and opportunities relating to climate change, as well as the action it has taken in the field of climate protection; this information is also fully accessible to GEA's customers. In the year under review, GEA significantly enhanced the result of its CDP survey and was awarded an A- (Leadership band) score up from B- (Management Level) in the previous year. With the new overall grade of A-, GEA ranks among the top enterprises at a sectoral and regional level. The "Leadership" scoring band is reserved for companies that stand out due to various factors like the completeness and transparency of their reporting.

Since 2017, GEA has disclosed the relevant data for the respective year under review that is audited by KPMG in accordance with ISAE 3000. Moreover, starting in 2018, GEA switched the way it presents CO_2 equivalents across all three scopes to a regional level as required by the CDP. The data series comprises the years 2017 to 2019. In 2019, GEA measured the CO_2 emissions released by its 78 largest sites that comprise production, service and administration.

As of 2019, the year under review, GEA started reporting the market-based CO_2 equivalents (under Scope 2) for countries in which energy supply companies can provide reliable information on the respective fuel mix using the latter as a basis for reference. In the year under review, the market-based calculation was performed for Germany and New Zealand.

Across the globe, the key figures for energy consumption are collected via a standardized system and reported as follows:

- Scope 1 – Direct Greenhouse Gas Emissions: GEA includes fuel emissions from fuel oils, various gases, diesel and gasoline.
- Scope 2 – Indirect Greenhouse Gas Emissions: GEA reports emissions from electricity, heat, steam and cooling (site-related in accordance with IEA conversion factors and/or market-based).
- Scope 3 – Other Indirect Greenhouse Gas Emissions: Currently, this category merely includes reporting on business travel.
- Intensity – Ratio of greenhouse gas emissions/GEA's sales

Further information on the method used for calculating CO_2 emissions in 2019 is outlined on the company's website at gea.com under "Explanatory notes to environmental reporting." The figures presented are – unless market-based – in line with the conversion factors stated in the GHG Protocol/IEA (11/2019) – IEA 2019.

Direct Greenhouse Gas Emissions (Scope 1), in tons of CO_2 equivalents	2019 ✓	2018* ✓	2017 ✓
Asia Pacific (excluding China)	548	562	529
China	492	472	373
DACH & Eastern Europe	19,166	18,737	23,772
Latin America	7	5	9
North America	6,397	8,150	7,199
Northern and Central Europe	1,611	1,402	1,356
Western Europe, Middle East & Africa	8,490	7,799	8,595
GEA total	**36,711**	**37,127**	**41,833**

✓ Audited by KPMG
*) Due to changes in allocation and computation, the reference base of reporting sites was adjusted in 2018.

Indirect Energy-Related Greenhouse Gas Emissions (Scope 2), in tons of CO_2 equivalents	2019 ✓		2018[1] ✓	2017 ✓
	site-related	market-based[2]		
Asia Pacific (excluding China)	1,569	1,466	1,463	1,340
China	5,702	5,702	4,779	4,614
DACH & Eastern Europe	17,925	13,701	18,661	19,628
Latin America	101	101	97	109
North America	5,946	5,946	6,107	5,513
Northern and Central Europe	2,659	2,659	2,459	3,472
Western Europe, Middle East & Africa	2,865	2,865	1,995	2,248
GEA total	**36,768**	**32,441**	**35,561**	**36,925**

✓ Audited by KPMG
1) Due to changes in allocation and computation, the reference base of reporting sites was adjusted in 2018.
2) market-based, 22 sites in Germany and New Zealand

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Indirect Greenhouse Gas Emissions (Scope 3), in tons of CO_2 equivalents	2019 ✓	2018[1] ✓	2017 ✓
GEA total	**18,412**	**21,021**	**15,958**

Total – Greenhouse Gas Emissions (Scope 1,2,3), in tons of CO_2 equivalents	2019 ✓		2018[1] ✓	2017 ✓
	site-related	market-based[2]		
GEA total	**91,890**	**87,564**	**93,709**	**94,716**
Ratio of tons CO_2 equivalent to GEA's revenue	18.83	17.94	19.40	20.59

✓ Audited by KPMG
1) Due to changes in allocation and computation, the reference base of reporting sites was adjusted in 2018.
2) market-based, 22 sites in Germany and New Zealand

Compared with 2018, GEA's business operations emitted less greenhouse gas emissions (Scope 1) while generating slightly higher revenues than in the previous year. GEA's energy efficiency optimization initiatives conducted at the sites had a positive impact and brought about a reduction in emissions of CO_2 equivalents under Scope 1. Overall, in 2019, GEA was able to lower its greenhouse gas emissions both in absolute terms and in relation to sales. This way, in the year under review, GEA achieved the set target of reducing CO_2 emissions by 1.5 percent (on a comparable basis, i.e. prior to changes due to market-based calculations) that had been agreed with the Executive Board: Based on the IEA conversion factors, the (equivalent) decline amounted to –2.95 percent, while a market-based calculation resulted in a –8.04 percent decrease.

In 2019, GEA was once again seeking to expand its climate reporting and is currently conducting several internal projects in this area. For instance, this includes an analysis of how greenhouse gas emissions can be captured, controlled and reported along the entire value chain (upstream/downstream); however, such emissions are frequently not or not completely under GEA's direct control, for example where the transport of goods or the procurement of stainless steel are concerned.

Energy audits

Since 2015, companies that do not fall under the EU Commission's definition of small and medium-sized enterprises have to carry out an energy audit every four years. They are obliged to do so under the German Energy Services Act (Energiedienstleistungsgesetz – EDL-G). The latter transposes into law the European requirements of the Energy Efficiency Directive (Directive 2012/27/EU of the European Parliament and of the Council of October 25, 2012). These energy audits were due in 2019, the year under review, and successfully completed. The captured energy savings potential of the various sites was systematically recorded; the respective potential is checked for feasibility, with subsequent implementation being tracked.

In Germany, GEA was subject to the obligation to carry out such energy audits in all of its companies, but it was no longer necessary to audit each and every German site, as the "multi-site procedure" defined in the energy audit information leaflet of the Federal Office of Economics and Export Control (Bundesamt für Wirtschaft und Ausfuhrkontrolle – BAFA) was applied. The respective energy audits were performed and assessed by approved energy auditors, with the final documentation as well as the so-called "corporate verification form" ("Nachweisführung für Unternehmen") being electronically transmitted to BAFA.

All audited GEA sites within the European Union comply with the respective national laws in line with Directive 2012/27/EU.

Water and waste

GEA is using resources sparingly and considerately. Environmental management comprises environmental protection at a corporate level as well as energy management, ensuring that the company is making continuous efforts to reduce consumption levels and environmental impacts at its sites. By capturing and visualizing the relevant key performance indicators, which are made available to the responsible site managers via dashboards on a daily basis, GEA has succeeded in significantly raising awareness and understanding of environmental matters at the sites. This data pool is also used as a basis for defining local environmental programs and campaigns. In addition, GEA's Environmental Core Rules serve as guidelines for pro-environmental and resource conservation behaviors of employees worldwide.

In 2019, GEA captured the water consumption of its 77 largest sites, which included production, service and administration. In this context, GEA showed a slightly lower demand of 284,700 cubic meters of water in 2019. At the moment, there are still no uniform international minimum standards for the quality of wastewater discharge that go beyond regulatory requirements for controlling the quality of such discharges. The respective evaluations have shown that sanitary effluents and irrigation water residues account for the bulk of the wastewater.

Water	2019	2018*
Water demand (in thousand cubic meters)	**284.7**	**294.5**
Municipal and mains water (in thousand cubic meters)	257.0	265.4
Water from wells and groundwater (in thousand cubic meters)	27.7	29.1
Water consumption		
thereof industrial and process water (in thousand cubic meters)	97.8	103.8
Wastewater (in thousand cubic meters)	251.8	272.4
Share of process water in total water consumption (in %)	34.3	35.4
Share of wastewater in total water consumption (in %)	88.4	92.5
Sites reporting water consumption	77	76

*) Due to changes in allocation and computation, the reference base of reporting sites was adjusted in 2018.

Management of water risks

The Global Risks Report 2019 released by the World Economic Forum identified the water supply crisis as the fourth-biggest risk to society in the next decade as far as its potential impact is concerned. A water crisis is defined as a significant decrease in the available quality and quantity of fresh water leading to adverse impacts on human health and/or economic activity. Examples include droughts and limited access to safe drinking water, which, in turn, may result in economic competition for water in terms of quantity or quality, disputes between users, irreversible groundwater extractions and negative effects on the environment. Currently, more than one billion people live in water-stressed regions, while by 2025, up to 3.5 billion people could suffer from water shortages. In many regions, enterprises can no longer rely on a stable supply of high-quality water for expanding their business.

As part of the recurring survey of environmental risks and opportunities, the year under review saw the focus being placed on water scarcity issues. For the purpose of ascertaining the impact of water shortage on its production, GEA has devised a process for identifying regions vulnerable to water scarcity risks. In the year under review, a mapping of GEA sites located in water-stressed regions was carried out. The respective classification is based on the "Aqueduct Water Risk Atlas," a tool using current data to create a global water risk map that is provided by the World Resources Institute, a non-profit organization. There are five water risk classes: low, medium low, medium high, high and extremely high. In 2019, the year under review, GEA focused on sites in regions exposed to extremely high, high or medium high water risks. This is where detailed queries – including the requirement to state specific reasons for the answers provided – were performed. Among other things, the company collected information on whether water risks were known and relevant to operations, which legal requirements needed to be met and which water conservation and saving measures were being taken.

It was established that five out of 76 production sites are located in areas subject to an extremely high water risk, with another nine locations being exposed to a high risk level and two more falling in the medium high category. Overall, these 16 sites accounted for 21.97 percent of GEA's total water consumption in 2018, with the 14 sites in the categories "high" and "extremely high" representing 19.48 percent of the company's overall consumption. All sites meet the relevant local laws and legal requirements, and none of them experienced any scarcity of water in 2018 or 2019.

Five production facilities operated by GEA in India and China are exposed to extremely high levels of water stress. Approximately 8.2 percent of GEA's total water consumption is attributable to these locations. In India, the production sites in Vadodara and Bangalore have initiated water conservation projects aimed at reusing water/reducing water consumption. This also includes the installation of wastewater treatment plants for reclaiming used water at both sites. Compared with the previous year, Vadodara, one of GEA's biggest manufacturing sites, achieved a 30 percent reduction in water consumption in 2018, and a more than 50-percent reduction in comparison with the reference year 2012. Currently, the sites are considering additional water saving measures to accomplish further reductions. In China, the Shijiazhuang production site has initiated a water savings plan to reuse test water for gardening and floor cleaning purposes.

Waste

Metals, which are recycled, accounted for 57 percent of the overall amount of 13,586 tons of waste generated in 2019. Hazardous aqueous substances made up 6.2 percent (846 tons) of total waste. The increase was due to the relocation of the flow components production to Suzhou. At 143 tons, the level of plastic waste remained low. The individual components are shown below:

Waste in tons	2019	2018*
Aqueous rinsing liquids containing hazardous substances	846	193
Machining emulsions and solutions not containing halogens	42	433
Packaging material: paper, cardboard	634	568
Packaging material: plastic	143	120
Packaging material: wood	2,184	1,863
Paper and cardboard	188	286
Domestic waste	1,413	1,285
Metals – recycling	7,758	9,721
Total	**13,586**	**14,470**
Sites reporting waste generation	70	62

*) Due to changes in allocation and computation, the reference base of reporting sites was adjusted in 2018

GEA primarily processes metals, which is why it places its main focus on recycling metal waste; GEA's recycling rate is at 57 percent. More efficient production led to an overall reduction in the amount of metal waste.

Moreover, GEA closely cooperates with suppliers and customers in order to develop environmentally-friendly packaging and ensure proper disposal and equipment recycling at the end of a plant's lifecycle. This also includes the production of bioplastics from waste: The majority of today's plastics are produced from fossil fuels like oil and coal. Owing to scientific progress in recent years, plastics can now be made from sustainable sources, namely plant-based raw materials like sugar cane, potato starch, cellulose (wood), corn, soy, used cooking oils as well as food and agricultural waste. GEA's specialists have a detailed knowledge of the key production stages, including the use of bio-based intermediates such as succinic acid that offer alternative routes for producing bioplastics. Another example is the production of lactic acid from plant-based feedstocks. Lactic acid is a basic material for the production of polylactic acid (PLA), a biodegradable, sustainable alternative to PET and one of the most frequently produced bioplastics worldwide. GEA's engineers are able to devise and develop bespoke systems for upstream and downstream process steps in the production of intermediates and biopolymers.

Natural risks at GEA sites

As part of its activities in the field of security management, GEA also checks the risks to its sites that are posed by natural hazards. Together with the insurer, GEA classifies its own sites according to hazards caused by wind speed, flooding and earthquakes. In the process, its 84 largest sites are analyzed based on their total insurance value.

By the end of 2019, the insurer had issued eight recommendations on natural hazards that were implemented by the respective GEA entities. This way, GEA ensures that employees and assets are well prepared for natural hazard events. The implementation of the recommendations is monitored within the framework of on-site inspections conducted by the insurer. In general, the insurer advises all sites on the development of emergency response plans whenever the risk assessment calls for such a step. Risk assessments and tools are available at site level.

Environmental responsibility in the supply chain

Responsibility for the environment is of key importance, not only with regard to GEA's products and services, but along the entire supply chain. The trust required for retaining long-term business relationships is only ensured by adhering to fundamental environmental protection standards along the entire supply and value chain, which is why compliance in this field is given highest priority. As an engineering group with a high level of materials expertise, GEA globally purchases raw materials, goods and services solely from qualified suppliers to ensure the long-term success of its customers by providing innovative product and service solutions.

The registration process for suppliers requires that the latter commit to the company's dedicated "Code of Conduct for Suppliers and Subcontractors." This set of rules specifies the commitment to engage in environmentally compatible business practices and renounce the use of conflict materials. For more information on the Code of Conduct and the handling of infringements, also see page 145 f.

Key suppliers are visited on an annual basis and also subjected to regular environmental assessments. In the year under review, the company conducted 426 supplier screenings (previous year: 492). GEA performs these evaluations by visiting subcontractors, conducting audits or requesting the voluntary disclosure of information; these activities have been undertaken by the country organizations and, until recently, the two Business Areas (as of 2020: Divisions) alike.

Sustainable engineering

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"engineering for a better world": This statement embodies the core value proposition of the GEA Group. Apart from responsibly shaping its own value creation processes, the company fosters sustainable business practices and contributes to the protection of the natural environment by offering its customers efficient products and process solutions. As a rule, the technologies and processes they employ are energy- and water-intensive, which is why energy and water savings as well as reductions in emissions or waste increasingly impact customers' investment decisions. For this reason, GEA's ambition is to come up with more solutions that drive the more efficient use of resources.

Lower consumption of resources, less floor space, extensive energy recovery potential, ease of operation – these are the criteria currently applied by customers when making their purchasing decisions. In turn, the latter have a direct and favorable impact on climate-relevant emissions and the protection of natural resources. More often than not, the economic and ecological criteria governing investment decisions made in GEA's customer industries are virtually identical since lower emissions based on enhanced efficiency also result in lower costs. Among others, GEA's business success depends on products and solutions that are more efficient than previous generations and, thus, reduce environmental impacts.

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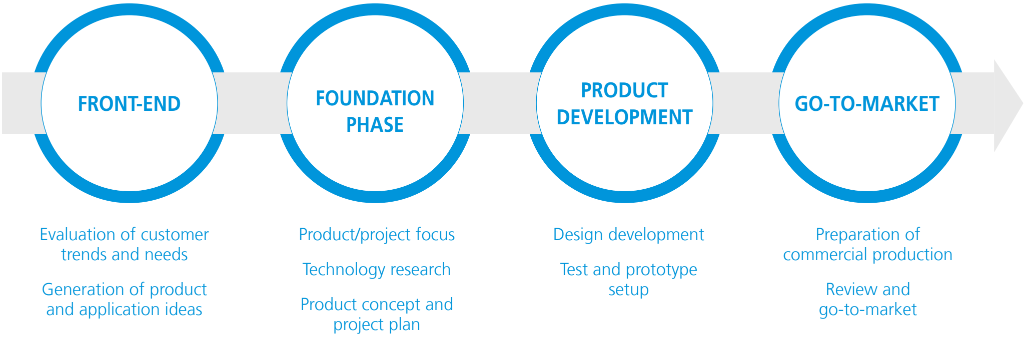
A capital goods manufacturer may only set itself apart from its peers and provide enhanced customer benefit by gaining technological leadership, which, in turn, requires innovation. In this respect, there is a connection between GEA's innovative strength and the positive effect of its products, solutions and services when it comes to mitigating climate change.

Climate change and the finite nature of resources offer considerable opportunities for the sale of efficient process engineering components and plants. Due to the large variety of components and processes and, notably, the need to collect comprehensive operating data outside the company's own sphere of influence, global verification of the entire product and service portfolio is not yet possible. For 2020, GEA is planning a project designed to enable the company to verify its contribution to emissions reductions through sustainable engineering/ sustainable products in the future. The effects on the customer side can only be estimated when the areas of innovation, product design and development, quality and safety, life cycle and services, which may be directly influenced by GEA, are jointly considered together with the ways GEA's technologies are put to use.

Management approach to sustainable engineering

The impact of potential gross risks in the field of product quality and performance would be severe (for more information, see "Opportunities and Risks Report" page 152 ff.). Quality and safety issues may lead to accidents and production losses on the customer side, followed by negative consequences in terms of health protection, reputation and earnings. GEA is tackling such risks on all levels as they bear on the very foundation of its business. The innovation process is followed by a uniform and detailed product development process that applies across the entire group. It incorporates fixed design criteria such as resource efficiency or the consideration of health and safety aspects throughout the entire lifecycle of a product. Moreover, this product development process also takes into account regional or industry-specific guidelines and standards, required approvals as well as test certificates. Prior to market launch, the design and construction of prototypes are closely validated. Within the framework of the innovation process, the product development process is supplemented by a so-called front end at the very start. The overall process is as follows:



For instance, ideators are already quizzed about sustainability aspects at the very beginning: Emissions, water consumption or the use of chemicals or filter media must be documented.

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Quality management, environmental management, occupational health and safety as well as energy management are checked via certifications, with their efficacy and performance being guaranteed in the process. GEA set up an internal "Product Safety Committee" for ensuring the safety of its products. GEA's service division makes sure that products and process equipment are available throughout their entire lifecycles; at the customer's request, the company is also able to prolong service life by modernizing (parts of) the respective equipment. At regular intervals, the suitability and success of the management concepts are measured on the basis of key performance indicators such as quality costs, complaints, customer satisfaction or the number of certified sites.

Product quality and safety as well as sustainable product design in the supply chain are ensured under the "Code of Conduct for Suppliers and Subcontractors" (see page 129 and 145 f.).

Quality, innovation and service in customer satisfaction surveys

In terms of customer satisfaction, GEA scores highest as far as the quality and performance of its equipment as well as technology innovations are concerned. This was one of the key findings of the second global customer satisfaction survey initiated by GEA in late 2016. In total, around 3,500 GEA customers from 41 countries participated in the survey. For the first time, the poll also included non-GEA customers in selected countries and customer industries. Ever since, the results of both surveys have served as the basis for improvement processes.

In 2017, the company carried out a follow-up survey by conducting just under 600 online interviews in 11 countries in which customers had been less satisfied with GEA's service and complaints management. Overall, the findings already revealed a slight improvement; apart from that, GEA was able to gain some useful insights with a view to potential further measures.

Following up on the 2017 poll, another global customer satisfaction survey with an emphasis on service was carried out in 2019, the year under review. The survey was event driven, i.e. following a business contact with GEA. The questions focused on the areas of customer service and spare parts. Overall, customer satisfaction with service and spare parts improved from previously average scores to levels equivalent to a high degree of satisfaction. In terms of on-site customer service, there is still room for improvement against the backdrop of average scores, but this potential can be clearly identified and addressed by means of appropriate measures.

GEA's innovation process

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GEA offers a wide range of components, systems and process equipment while never tiring of improving them in terms of resource efficiency, flexibility, quality and costs. GEA has defined around 200 core technologies that offer tremendous potential for optimization, also when combined with other technologies.

The front end of innovation management, i.e. the systematic generation of ideas as well as a feasibility check, includes tools for problem solving and advancing the number and quality of submitted ideas, the systematic analysis of market- and technology-driven trends and customer needs, as well as an ideas platform.

Throughout the year 2018, GEA continued to roll out its innovation management program which includes the innovation process, the state-of-the-art "InnoVate" IT system for generating ideas and allowing them to mature, as well as defined roles and responsibilities for steering the further development of innovative ideas.

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As part of the new organizational structure, GEA will have a "Global Technology" division from the 2020 fiscal year onwards; this unit will be dedicated to further strengthening the company's strategic focus on technology. Global Technology will be headed by the new Chief Technology Officer (CTO), who will directly report to the Executive Board. The division is to ensure that GEA's technology portfolio will continue to meet market trends and customer requirements in the future. Global Technology will be divided into four priority areas: Innovation, engineering excellence, digitalization and intellectual property rights.

Idea campaigns

The year under review witnessed the further development of the concept of campaign-based ideas as the front end of sustainable product development. Expected content and objectives are outlined on the basis of an assessment of the strategic needs of a business unit (or a number of business units). Information on why the campaign was launched in the first place, the specification of the precise needs and the related skills and competencies within the community as well as the underlying question "How can we help?" are to guide the addressees in their focus on contributing to the ideas campaign by submitting their own ideas and comments or even going as far as to state their preferences.

The campaigns may be divided into five different categories addressing either "innovation" or "efficiency:"

	Efficiency	Innovation
Creative		•
Problem solving		• •
Discovery	•	• •
Testing		
Feedback		• •

• Campaigns conducted in 2019 • Campaigns conducted in 2018
Source: GEA Innovation Management

The respective campaign targets define the nature of the campaign; in turn, this helps identify the group of addressees and the kind of input anticipated:

- Creative: Making new offers or tapping new markets; creating long-term visions; responding to emerging trends
- Problem solving: Resolving technical challenges; improving quality standards; risk mitigation; cost savings
- Discovery: Spotting and assessing trends; identifying skills for the purpose of developing something specific; identifying best practice; root cause analysis
- Testing: Optimizing the offer prior to market launch; assessing new areas including sales and marketing; reviewing quality standards
- Feedback: Customer input; feedback from service staff; voice of sales; feedback on new skills

A total of seven idea campaigns were conducted in 2019. Major overarching subject areas were identified on the basis of customer experiences and addressed the following topics:

- Optimization of customer business: Reducing equipment and plant downtimes during cleaning, tool change, maintenance and repair work
- Sustainability: Reducing or avoiding the use of energy, water and chemicals for cleaning and sterilization purposes; reducing waste (e.g., packaging); recycling opportunities
- Product safety: Possibility of applying sensors for product quality purposes; identifying new technologies for chemical-free cleaning.

The campaigns conducted in 2019 produced ten ideas for Gate 1 (front-end phase).

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Key figures from the innovation process

For gauging the success of the resources allocated to the field of innovation across the entire company, GEA relies on key performance indictors during all stages of the innovation process. At the end of 2019, there were 324 (2018: 400) active ideas or projects in the "front-end" and "foundation" phase, with 159 (2017: 230) future product innovations undergoing the "development" and "go-to-market" phase. In 2019, 165 new ideas were submitted via the InnoVate Portal, 78 of which resulted from the theme-related ideation campaigns. While 73 ideas and projects were shelved or stopped, GEA was able to launch 50 concrete projects. Most of them have left the innovation process as new, marketable products. This goes to show that ideas undergo a much stricter selection process during GEA's front-end phase. What is new is that ideas, which are not immediately taken up, are stored as "inactive" and no longer counted. This way, GEA seeks to make sure that highly promising ideas are pursued and evolved more swiftly and purposefully. The key performance indicators are regularly reported to the heads of development and the management bodies.

For detailed information on GEA's research and development activities, refer to the section on "Research and Development" (see page 44 ff.).

Agile product development

To allow for a goal-oriented and swifter transition from product idea to product development, the company established a number of specific methods and put them into practice. GEA does not define agile product development exclusively as an approach designed to accelerate product development, but puts much more emphasis on integrating customer feedback into the concept and pre-development stage as early as possible in order to assess applicability and identify the right specifications of the product-to-be. Opting for this course of action, GEA meets two major challenges: Customer acceptance as well as possible obstacles in the sales process that need to be tackled, especially when it comes to complex applications that require broader explanations.

In 2019, six training courses and workshops for teaching and implementing agile methods in product development were delivered to nearly 100 participants. These courses convey the fundamentals of agile methodologies and show how to integrate them into daily routines.

In the year under review, a number of open innovation activities were carried out:

- ZentriTec: As part of the "garage33" business accelerator program in Paderborn, Germany, the internal ZentriTec start-up team developed a total of four solutions. In cooperation with students from the University of Paderborn, GEA employees developed new sensor solutions for specific separator applications in the shipbuilding sector. Within a short period of six months, including development and testing under real-life conditions, two separators were prepared for market launch. A key element for the success of this project was customer involvement.
- GEA Advance: Based on a software solution developed by the Swiss start-up company MachIQ, GEA Equipment Service has devised a cloud-based, open service platform for digital services. The provider-independent portal offers modern services like remote maintenance, data analysis and e-commerce. MachIQ was the most successful start-up under the MassChallenge Switzerland business accelerator program in 2016.
- MassChallenge Switzerland: One of the founding sponsors since 2016, GEA takes an active role in the start-up community, placing particular focus on nutrition, health and life science topics. The program offers equity-free access to the start-up network. In 2019, GEA identified 28 out of a total of 89 start-ups active in areas offering potentially suitable technology for GEA or the prospect of market viability. By the end of the year, two new cooperation agreements with these start-ups had been concluded.

Digitalization is part and parcel of GEA's innovation process and actively steered by the company's Innovation Management team. Digital tools change the nature of ideation and concept qualification while accelerating product development. This enables GEA to gain a level of agility that helps speed up the evolution of functional products. In addition, these tools lead to disruptive business ideas that have the potential to transfer GEA's application knowledge to a previously untapped market segment while generating a new type of demand.

Digitalization may pave the way to innovation and simultaneously outline a solution. For meeting today's digital challenges, GEA connects with strong partners, including suppliers and customers as well as market players and the scientific community. This so-called cooperative competition aims at creating added value benefiting all parties involved.

Products subject to specific regulatory requirements

GEA's portfolio embraces two relevant product groups and/or substances required for product operation that are subject to specific regulations: chemical products for farming and coolants for refrigeration systems. Undiluted chemicals for farm technology applications, such as dipping agents for milking hygiene, are processed at 11 GEA facilities worldwide. In terms of coolants for GEA refrigeration systems, ammonia has become widely accepted as the natural and carbon-neutral cooling agent of choice.

All GEA products meet the respective statutory requirements of the markets, come with the necessary certifications and/or comply with the technical guidelines and any further demands made by customers.

Product life cycle

GEA documents each stage of the product life cycle in order to capture and take into account both positive and negative effects on natural resources with regard to the development and planning, purchase and transport, production, shipping, operation and disposal of products (and, where applicable, process solutions). In the course of a product's life cycle, any and all information on this product is collected. In this context, the focus is not only placed on technical aspects, but the company also takes into consideration economic and ecological aspects. GEA thus pursues the goal of making potential environmental effects transparent and traceable at every stage of a product's life cycle. This life cycle perspective has already been recorded in detail at many international sites, including Drummondville/Canada (liquid manure technology), Parma/Italy (homogenizers), Plainfeld/Austria (hygiene and dipping agents), Oelde (separators), Büchen (valves), Bönen (milking technology) in Germany, as well as additional sites located in Great Britain.

Information security and protection of intellectual property

Information security refers to the confidentiality, availability and integrity of information stored and processed by the organization – irrespective of whether this is done via technical or non-technical systems. Information security includes the protection against risks and/or threats, loss avoidance as well as risk minimization. GEA relies on organizational and technical means to ensure that both its own data and information entrusted to it are protected against unauthorized access. Apart from the complete set of tools provided by the specialist departments for information technology and IT security, the company also avails itself of all appropriate legal instruments for the purpose of corporate governance and when concluding agreements. In addition, the protection of trade secrets is also specified in a GEA guideline on information security ("Information Security Policy").

Against the backdrop of digitalization, the transmission of production and process data from the customer to GEA becomes increasingly important, for instance for the purpose of performing predictive maintenance and repairs or carrying out remote maintenance. As a rule, the protection of data and transmission channels is contractually stipulated and ensured in close cooperation between the customer and GEA. In the year under review, GEA did not receive any duly substantiated complaints regarding a breach of customer privacy and the loss of customer data.

Intellectual property essentially comprises knowhow, ideas, inventions, developments, sketches, plans, results as well as data. Such confidential information, the company's know-how, patents as well as other intellectual property rights constitute the backbone of GEA's technology leadership when it comes to systems and processes. As a consequence, the company rigorously protects and defends the patent and trademark rights as well as the copyrights held by it. GEA know-how is only disclosed following the conclusion of written confidentiality and/or non-disclosure agreements. GEA provides patent-related information in the section on "Research and development," see page 50.

GEA Service

Apart from production efficiency, the commercial success of customers primarily hinges on the availability of technologies. State-of-the-art production facilities and plants are highly automated, and even minimal downtime may have a major impact on a customer's productivity.

At an annual growth rate of approximately five percent and following the successful rollout of several new service products and initiatives, GEA's global service business fared very well during the previous year. GEA seeks recognition as the world's leading industrial supplier of life cycle service concepts. GEA's job is to establish, preserve and enhance customers' plant performance over the entire life cycle of their respective plants or facilities. By pursuing this life cycle approach, GEA accompanies customers as a value-added partner throughout the entire life cycle of a plant: From dimensioning, commissioning, spare parts supply with fast response times, service level agreements, repair after failure up to preventive and predictive maintenance. In this context, digital services such as real-time condition monitoring also feature more and more prominently.

To better meet customer expectations, the company's strategic initiatives and actions undertaken in the year under review focused on bringing about improvements in performance: To this end, GEA defined a set of key processes for the Service department with clear responsibilities and standardized key figures to allow for better handling of global and local services. The customer relationship management system is gradually being expanded by adding a post customer contact survey function for measuring the level of customer satisfaction. Moreover, a new training module for service managers makes sure that local service activities are performed in line with uniform and globally valid standards.

In addition, GEA has improved the performance and response times of its central technical support functions, enhanced the level of efficiency when it comes to planning and executing field service activities and invested in the global repair shop network. This goes hand in hand with the enhancement of the multi-tiered spare parts logistics system, which enables GEA to further speed up spare parts delivery worldwide in line with demand.

Apart from that, GEA continues to expand the number of digital solutions in the service area. The evaluation of continuously measured process parameters allows for an even steadier and more consistent operation and control of plants and processes. One example of these activities is a cloud-based platform for digital services. The supplier-independent portal offers customers state-of-the-art service solutions like remote maintenance, data analysis and overarching e-commerce while enabling the company to seamlessly integrate all interactions with suppliers into a common platform. GEA developed the digital cooperation channel for its service business together with MachIQ, a start-up company that won the 2016 MassChallenge Switzerland, a program sponsored by GEA.

Accounting for more than 30 percent of GEA's sales revenues in the year under review, the service business met the set target.

Social responsibility for employees

The group's success reflects the result of the performance of more than 18,000 employees. Each and every one of them is instrumental in accomplishing the company's overall result. GEA's employees form the backbone of the future value enhancement of the company.

Detailed headcount figures are provided in the company's "Report on Economic Position" (see page 66).

Employment

Against the backdrop of demographic change and rising competition for talent, GEA needs to regularly and successfully recruit skilled and qualified people to complement its diverse workforce. Retaining them is another essential task of human resources management. Both are prerequisites for satisfied employees and the future viability of the company. For this reason, the year under review sees GEA's first report on new hires and employee turnover.

In 2019, GEA hired a total of 1,409 new staff versus 2,072 new entries in 2018. As of December 31, 2019, the total number of new hires as a percentage of the average number of employees in the previous year had fallen from 11.5 percent to 7.7 percent. This marked decline was mainly due to a restructuring program that was launched in May 2019 and reinforced back in September. By the end of 2020, the restructuring plans should reduce the workforce by a total of around 800, which includes GEA employees and temporary workers.

Compared with 1,618 employees leaving the group in 2018, the year under review saw 1,539 departures. Year on year, the turnover rate declined from 9.0 percent in the previous year to 8.4 percent as of December 31, 2019.

Total number and rate of new hires by region, age group and gender 12/31/2019	Aged < 30			Aged 30 – 50			Aged > 50			GEA total		
	Male	Female	**Total**	Male	Female	**Total**	Male	Female	**Total**	Male	Female	**Total**
DACH & Eastern Europe												
Total number of new hires	73	26	**98**	184	44	**229**	40	4	**44**	297	74	**371**
Rate of new hires (%)	12.6	15.8	**13.3**	6.5	6.0	**6.4**	1.7	0.8	**1.5**	5.1	5.3	**5.2**
Western Europe, Middle East & Africa												
Total number of new hires	44	14	**58**	108	40	**148**	18	1	**19**	170	55	**225**
Rate of new hires (%)	25.5	47.3	**28.7**	7.4	12.2	**8.3**	2.8	1.3	**2.6**	7.5	11.9	**8.3**
Northern and Central Europe												
Total number of new hires	43	20	**63**	172	28	**200**	61	7	**68**	276	55	**331**
Rate of new hires (%)	29.3	41.5	**32.3**	14.1	9.2	**13.1**	5.2	3.8	**5.0**	10.9	10.4	**10.8**
Asia Pacific												
Total number of new hires	54	9	**63**	156	36	**192**	11	2	**14**	221	48	**269**
Rate of new hires (%)	21.7	21.5	**21.7**	8.0	9.0	**8.2**	3.4	4.6	**3.5**	8.7	9.7	**8.9**
North America												
Total number of new hires	44	6	**50**	50	23	**73**	23	6	**29**	117	35	**152**
Rate of new hires (%)	33.1	19.5	**30.6**	7.4	18.3	**9.1**	3.3	5.6	**3.6**	7.8	13.4	**8.7**
Latin America												
Total number of new hires	4	4	**7**	39	10	**49**	4	1	**5**	46	15	**61**
Rate of new hires (%)	15.2	15.2	**15.2**	12.4	11.3	**12.2**	4.3	13.5	**5.2**	11.0	12.2	**11.2**
Total												
Total number of new hires	262	78	**340**	709	182	**891**	158	21	**179**	1,128	281	**1,409**
Rate of new hires (%)	20.0	22.8	**20.6**	8.6	9.2	**8.7**	2.7	2.1	**2.6**	7.5	8.6	**7.7**

The rates of new entries refer to the total number of employees in the respective group

Total number and rate of departures by region, age group and gender 12/31/2019	Aged < 30			Aged 30 – 50			Aged > 50			GEA Total		
	Male	Female	**Total**	Male	Female	**Total**	Male	Female	**Total**	Male	Female	**Total**
DACH & Eastern Europe												
Total number of departures	23	6	**29**	114	35	**149**	107	26	**133**	244	67	**311**
Departure rate (%)	4.0	3.4	**3.9**	4.0	4.8	**4.2**	4.4	5.4	**4.6**	4.2	4.8	**4.3**
Western Europa, Middle East & Africa												
Total number of departures	25	2	**28**	100	26	**127**	50	6	**55**	175	34	**209**
Departure rate (%)	14.6	7.5	**13.6**	6.9	8.0	**7.1**	7.8	5.2	**7.4**	7.8	7.4	**7.7**
Northern and Central Europe												
Total number of departures	30	7	**37**	140	34	**173**	111	20	**130**	280	61	**341**
Departure rate (%)	20.6	14.6	**19.1**	11.5	11.0	**11.4**	9.4	11.5	**9.6**	11.0	11.5	**11.1**
Asia Pacific												
Total number of departures	45	9	**54**	194	37	**230**	35	5	**40**	273	51	**324**
Departure rate (%)	18.0	21.1	**18.5**	9.9	9.0	**9.8**	10.2	11.2	**10.3**	10.8	10.3	**10.7**
North America												
Total number of departures	36	10	**46**	124	27	**151**	92	14	**106**	252	51	**303**
Departure rate (%)	26.8	33.0	**27.9**	18.4	21.5	**18.9**	13.4	13.7	**13.4**	16.8	19.7	**17.2**
Latin America												
Total number of departures	8	2	**10**	27	7	**34**	7	0	**7**	42	9	**51**
Departure rate (%)	33.8	8.5	**21.1**	8.4	8.3	**8.4**	8.5	0.0	**7.6**	9.9	7.7	**9.4**
Total												
Total number of departures	169	36	**205**	702	167	**869**	396	70	**465**	1,267	272	**1,539**
Departure rate (%)	13.0	10.7	**12.5**	8.3	8.3	**8.3**	7.5	7.5	**7.5**	8.4	8.3	**8.4**

Departure rates refer to the total number of employees in the respective group

Employee engagement survey

In 2018, GEA had implemented a new approach for ascertaining employee satisfaction via a pilot project that among other initiatives, included two employee engagement surveys. A representative group of approximately 30 percent of GEA's total workforce was asked to comment on their satisfaction with line managers, personal development opportunities, their trust in senior corporate management, the working environment as well as structural issues within the group. Between the first and the second survey, the company took measures to improve areas identified as requiring action. The second survey in November already showed a slight improvement in satisfaction compared with the results obtained in June 2018. Both surveys resulted in global measures that were agreed with a special focus on enhancing IT support, communication GEA's strategy and the allocation of responsibilities.

In 2019, the year under review, the main emphasis was placed on introducing and implementing these improvement measures. Another employee engagement survey was carried out in November 2019 and involved all GEA employees worldwide. The survey focused on ascertaining the general level of satisfaction amongst employees, establishing to what degree GEA was regarded as an attractive employer and on requesting an evaluation of the measures initiated in the year under review. Likewise, GEA developed a concept designed to enable the company to continuously respond to employee feedback and ensure active workforce participation in the development of the enterprise in the years to come. As a consequence, GEA employees shall be asked for their feedback on an annual basis while the company continues its endeavors to enhance working conditions and GEA's attractiveness as an employer.

Labor/management relations and co-determination

Labor/management relations at GEA are characterized by many years of respectful dialogue and mutual interaction between the company and employee representatives as well as parity co-determination on the company's Supervisory Board. The latter embraces equal numbers of shareholder and employee representatives. Since the employee representatives serving on the Supervisory Board are elected by the entire German workforce, the interests of all German employees – blue collar workers, white collar workers, and executives alike – are represented in the form of co-determination at company level. Apart from numerous local works councils and general works councils, GEA also has a Group Works Council (GWC) established in accordance with the German Works Constitution Act. At corporate level, local matters and issues are regulated by means of works agreements.

GEA's European Works Council (EWC) has the statutory right to be informed and consulted by the management. It engages in a regular dialogue with the Executive Board and Human Resources. The activities of the European Works Council focus on transboundary effects of decisions and developments on employees in the EU member states, the countries of the European Economic Area as well as Switzerland. In 2018, the EWC and GEA's Executive Board jointly continued developing and adjusting the basic principles of EWC work in a new EWC Agreement with the assistance of IndustriALL Global Union, the global union federation.

Disclosure 102-41

Worldwide, around 49 percent (previous year ca. 48 percent) of the workforce are covered by collective agreements. This disclosure is based on data taken from the global "Workday" human resource management system.

Talent management and leadership development

To meet the company's current and future demand for executives, GEA identifies high performers and potentials within the framework of a global, cross-functional and connected talent process. This process aims at systematically developing talents and retaining them while ensuring that they are optimally positioned within the company.

In 2019, GEA once again conducted a number of different talent programs for promoting young talents and executives. The target group of the "First Professional Program" includes young talents with leadership potential, while "Professionals on Stage" is a scheme designed for executives looking back on several years of experience. Furthermore, GEA is a member of the Global Business Consortium of the London Business School together with five other renowned international enterprises. The program is open to top managers and seeks to enhance their strategic skills. All in all, more than 90 high potentials from different nationalities, functions and business units attended the various programs in 2019. Moreover, GEA offers training for executives. These courses include: "Leading Others," "Leading Leaders," "Engaging Employees" and "Leading Virtual Teams" that with a on strengthening leadership skills. In addition, all young talents and executives may avail themselves of the "GEA Leadership Toolbox," a constantly growing collection of best practice and tried and tested management and leadership tools. These learning opportunities are rounded off by a wide range of e-learning courses.

Moreover, the year 2019 saw the implementation of a 360-degree feedback tool. The latter allows both executives and project managers to seek individual feedback from various groups of individuals (line manager, employees, co-workers, customers). After receiving their respective anonymized assessments, executives may avail themselves of the support provided by trained HR staff and analyze their feedback to derive suitable development measures for themselves.

Learning and development

GEA's Learning Center has been the central learning and development provider for all employees worldwide since 2015, offering management, sales and project management training as well as GEA product and user training courses. In addition to the comprehensive range of e-learning courses on technical, business and product-related topics, the portfolio was supplemented in 2019, notably by further e-learning opportunities in the field of digitalization. All measures aim at supporting employees in their individual and occupational development. In the year under review, an overall number of 4,957 employees, i.e. 27 percent of GEA's entire workforce, made use of the learning and training opportunities offered by the company. 1,627 employees attended classroom-based training courses, 1,169 participated in integrated training initiatives while 3,872 attended trainer-hosted webinars. A total of 3,364 e-learning seminars were delivered. The average period per employee invested in attending face-to-face training modules was 3.3 days of learning.

Vocational training in Germany

	GEA 12/31/2019	GEA 12/31/2018
Apprentices	368	358
Apprentice/employee ratio (in %)	5.9	5.8

In the year under review, GEA trained 368 young people at 14 German sites in 11 commercial and industrial/technical occupations, which fall into different specialty areas depending on the product portfolio of GEA's specific sites. In this context, the company's site in Oelde serves as the center of technical training, coordinating the respective training schedule for all of Germany. Moreover, a total of 14 combined vocational training and degree programs were realized in cooperation with polytechnics and universities. These combined degree programs cover a period of six semesters and lead to bachelor degrees in various fields of expertise. For students participating in combined degree programs, GEA has given the practical periods more of an international focus by offering projects in GEA companies located abroad.

Work-life balance

GEA explicitly endorses a good work-life balance and supports its employees through a variety of different measures. For instance, some sites have experienced go-to persons for expectant mothers and fathers or also offer flexible working arrangements. In 2019, the year under review, 3.4 percent of the German workforce availed themselves of the opportunity to take parental leave (previous year: 3.2 percent), with 67.8 percent of them being fathers while mothers accounted for 32.2 percent. The average duration of parental leave in 2019 was 20.4 months for women and 2.6 months for men. Likewise, GEA cooperates with an international external service provider to assist employees in their search for suitable facilities that provide childcare and/or look after dependents in need of care. In addition, this offering includes free social counseling.

Employee mobility

To meet market requirements and safeguard the sustained, long-term competitiveness of the company, it is increasingly imperative that the know-how and expertise of GEA's employees are available on a global level. For this reason, GEA established a central competence center for international employee mobility as early as 2014. This does not only ensure professionalism when it comes to the legally correct implementation of global contractual standards, but also enhances the level of efficiency in terms of the operational realization of international work assignments. The activities undertaken by the competence center allow for the equal treatment of all internationally mobile employees.

Company pension schemes

GEA grants its employees pension benefits under defined contribution or defined benefit pension schemes. Employees have the possibility of actively shaping their pension plans together with GEA. Supporting company pension schemes allows GEA to respond to demographic change and retain qualified staff in the long run. GEA strives to continuously optimize existing administrative processes as well as global pension-related service structures to enhance both the transparency and the economic efficiency of such pension schemes. In doing so, the company never fails to ensure that the pension schemes fully comply with any and all legal and regulatory requirements.

GEA Aid Commission

GEA supports employees in need in many different ways. In a works agreement concluded with the Group Works Council, GEA has pledged to grant swift and unbureaucratic financial assistance to individuals in distress, for instance in the event of accidents or sudden, severe illness. Under such circumstances, affected employees, including their families, may turn to the GEA Aid Commission for help.

Diversity and equal opportunities

GEA operates in a challenging international market environment with a large number of players who influence the company in many different ways – ranging from customers, competitors and employees to the government and society in general. GEA meets the numerous challenges associated with this extremely diverse cultural environment by adhering to the principle of diversity. GEA considers diversity to be a strategic success factor. In this context, diversity is defined as the composition of the workforce in terms of origin, gender, age and qualification. Overall, GEA employs people from around 80 different nations. The age structure of GEA's workforce is as follows: 9.0 percent of the employees are younger than 30, 57.0 are aged between 30 and 50 while 34.0 percent exceed the age of 50.

In order to promote diversity on as many levels as possible and to create an attractive working environment by doing so, GEA also takes into account aspects of modern work flexibilization while fostering mobility within the group.

To institutionalize and manage diversity within the company, the latter relies on its “Diversity Management Policy” as well as a corresponding guideline for executives: This policy describes the overriding goal and the steady state of diversity management at GEA. It provides managers with an instrument for implementing diversity management at all group levels. The policy defines diversity on the basis of four personal criteria – origin, gender, age and qualification – as well as two organizational criteria, namely mobility and flexible working. The latter refers to both working time and a person’s place of work. GEA has implemented a mix of measures designed to promote diversity. For instance, staffing processes place emphasis on including diversity criteria as a standard practice. One of the aims is to attract more women to GEA despite the sector-specific challenges.

Members of governing bodies and employees by gender (in %)	12/31/2019 thereof men	thereof women
Supervisory Board	58.3	41.7
Executive Board	75.0	25.0
Managers*	89.6	10.4
Total workforce	83.4	16.6

*) Number of employees in leadership positions, excluding inactive work relationships; at GEA, the first three management levels below Executive Board level are defined as managers

For a number of years, the principles of diversity and equal opportunities have been taken into account with a particular emphasis on human resources. Moreover, when nominating candidates for talent programs, executives are encouraged to consider a proportion of female candidates that exceeds the average total percentage of women employed with GEA. This ensures a balanced representation of both genders as far as leadership development is concerned.

Additional information on GEA’s diversity concept is provided in the Corporate Governance Report including Corporate Governance Statement on page 82 f.

Protection of personal data

For an innovative and global enterprise like GEA, information and its use are of significant importance for accomplishing the set corporate targets. GEA protects the privacy of every individual whose personal data are processed by the company. This includes employees, customers, suppliers, other contracting partners as well as job applicants and applies to all GEA companies and specialist departments handling personal data. Privacy breaches may entail considerable penalties and even result in fines and imprisonment in some countries. Thus, the EU General Data Protection Regulation (GDPR), which came into effect on May 25, 2018, provides that non-compliance may be punished by imposing fines of up to four percent of group revenue. Moreover, breaches may entail the exclusion from public contracts. Ultimately, privacy breaches may also damage GEA’s reputation in the long run. Therefore, GEA insists on the implementation of data protection rules and regulations and reserves the right to take action against anybody failing to comply with data protection laws. For instance, this includes disciplinary measures, but also the enforcement of damages.

The company’s recast Data Protection Policy launched in 2019 specifies guidelines and recommendations for action addressed to all employees with a view to avoiding privacy incidents or privacy breaches. It forms part of GEA’s global compliance principles and is supplemented by classroom-based training for employees working in sensitive areas as well as e-learning measures for all employees with a user account. 2019 also saw the introduction of the corresponding data protection management system. The latter covers all organizational aspects, i.e. the roles, tasks and responsibilities as regards the processing of personal data, regardless of the type of individuals affected (including employees, customers, suppliers, shareholders etc.) or the technical means for processing such data. It also includes additional channels for reporting risks and violations; GEA already complies with the short response times that are legally required.

NFS

Compliance with data protection regulations and applicable data protection laws is verified on a regular basis. These checks are performed by the company's respective data protection officers and further corporate divisions vested with audit rights or by commissioned external auditors. Third party providers are vetted on the basis of self-declarations, audits as well as certificates.

Non-compliance with laws and regulations in the social and economic area

If employees violate compliance rules, such non-compliance is punished depending on the degree of fault as well as the severity of the case. The sanctions imposed range from a reprimand to a warning letter and may ultimately lead to termination of employment. In particularly severe cases, GEA reserves the right to sue the person in question for damages and/or report the violation to the competent authority.

GEA expects all employees to report any signs of compliance violations. Managers must ensure that serious misconduct, particularly in the areas of corruption, competition law and data protection, is reported to Global Corporate Center Legal & Compliance.

In the 2019 fiscal year, no substantial fines for non-compliance with laws and regulations in the social and economic field were imposed on GEA.

Social engagement

Since 2019, GEA has been a member of the World Economic Forum (WEF). The WEF was established as a charitable foundation back in1971, officially holding the status of an international organization since 2015. It is free from any political or national interests. GEA is involved in the "Advanced Manufacturing and Production" initiative of the WEF.

As a global player, GEA participates in a multitude of regional and local projects and initiatives while interacting with more than 200 trade and industry associations by discussing technical and market-related topics. For instance, GEA is a member of the "Verband Deutscher Maschinen- und Anlagenbau" (VDMA – German Engineering Association) and also actively involved in the association's "Corporate Responsibility" working group that was established in 2017. A list of GEA's key memberships in organizations is available at gea.com. As a rule, membership matters are handled autonomously by the individual sites as they see fit.

In addition, GEA is engaged in a large number of partnerships involving German schools and universities. Cooperation between educational institutions and companies support students in their transition to the world of work and offer career guidance and counseling to ensure that, going forward, there are sufficient young talents willing to take up jobs in the fields of engineering and natural sciences, in particular. Information on some of these initiatives is provided on GEA's website at gea.com.

Human rights

As early as 2007, the Executive Board and the European Works Council of GEA Group Aktiengesellschaft as well as the European and the International Metalworkers' Federations developed and adopted the basic principles of social responsibility that apply to all group employees worldwide. In fiscal year 2019, this code was revamped and significantly expanded, whereupon it was signed by the Executive Board of GEA Group Aktiengesellschaft, the Group Works Council as well as the European Works Council on March 15, 2019. In its "Code of Corporate Responsibility," GEA fully recognizes the "Guidance on Social Responsibility" (ISO 26000). GEA has uncompromisingly committed to respecting human rights, engaging in fair operating and business practices, in particular anti-corruption, and to acting in an environmentally-friendly and sustainable way. Furthermore, GEA is committed to fair world trade, supports the principles of the UN Global Compact while referring to the ILO core labor standards as well as the OECD Guidelines for Multinational Enterprises.

GEA respects universal human rights and supports their observance within the scope of its regional influence and vis-à-vis its business partners. GEA opposes any kind of forced labor and bans child labor. As far as child labor is concerned, the company regularly monitors the "Workday" human resource management system checking it for employees under 18 years of age. At the end of the year, 55 employees were younger than 18 years, as a rule apprentices in Germany. No GEA employee is under 16. In addition, the Code of Corporate Responsibility acknowledges the right to a fair living wage/remuneration. Moreover, GEA opposes any form of violence.

The new Code of Corporate Responsibility is binding on all employees worldwide without exemption. It obliges managers and employees at all levels to comply with, accept and promote the agreed objectives. In collaboration and consultation with the Executive Board, the senior management teams of the respective regional companies are responsible for their implementation. A copy of the Code of Corporate Responsibility is handed out to all employees across the group and/or made available in electronic form. All employees have the right to address and complain about issues and problems as well as non-compliance in connection with the agreed principles without fear of disadvantages or sanctions. Employees, including third parties, may use the whistleblower system (see section below) or – at their discretion – reporting channels via the signatories – i.e. the Executive Board, the Group Works Council and the European Works Council.

Online training on business ethics as well as responsible and non-discriminatory behavior is available to all employees worldwide via GEA's Learning Center (see page 140).

Integrity system (whistleblower system)

A professional integrity system is an effective tool for ensuring and monitoring adherence to the Code of Corporate Responsibility as well as the compliance rules. Since 2014, GEA has offered its employees – including third parties – the certified Business Keeper Monitoring System (BKMS), a secure portal that may be used for reporting such violations.

The integrity system does not constitute a general platform for voicing complaints. It embraces selected reporting categories that imply particular risks to the company, its employees and all other stakeholders. These categories include corruption, fraud and breach of trust, money-laundering, as well as violations of antitrust and competition law, export control regulations, data protection and accounting regulations. Breaches of the Code of Social Responsibility come under a distinct reporting category that also includes reports on potential human rights violations.

GEA's integrity system is available worldwide 24/7 in nine different languages and may be accessed from any PC connected to the Internet. The information technology used by the external provider ensures whistleblower protection and confidentiality. Subject to their respective remits, only a very limited number of GEA employees from Compliance, Internal Audit and Human Resources have access to the reports submitted. For protecting both whistleblowers and accused individuals, all incoming reports are treated confidentially. Should the whistleblower prefer to submit his/her report anonymously, he or she may do so provided that this is permitted in their respective country.

The system ensures that all steps involved in processing and resolving the reported cases are properly documented. If an incident is reported under the Integrity System, this report is assigned to the competent department (e.g., HR), whereupon the respective facts of the case are investigated in order to arrive at a conclusion. Should it be impossible to ultimately clarify the circumstances without obtaining additional information that might compromise the whistleblower's anonymity, the whistleblower is contacted by one of the above departments asking whether a further probe into the matter is requested. The competent departments get to the bottom of concrete individual incidents and consider whether enhanced communication or staff management, a change of processes or the use of software may help avoid such cases in the future.

In the year under review, a total of two reports falling under the specific remit of Human Resources were filed under the BKMS. They involve three employees. The topics that were addressed include leadership behavior, style of communication, behavior among staff.

Human rights in the supply chain – social assessment of suppliers

GEA expressly requires its business partners to generally apply the values and rules set out in the Code of Corporate Responsibility. For ensuring compliance with these values and the rules of corporate social responsibility along the entire value chain, GEA has adopted its own Code of Conduct for Suppliers and Subcontractors. GEA practices a zero-tolerance policy with regard to unethical behavior in business, in particular when it comes to bribery, corruption, money laundering or child and forced labor. The supplier registration process requires that suppliers undertake to abide by GEA's dedicated Code of Conduct for Suppliers and Subcontractors, which was released and implemented in 2018. GEA's Code of Conduct defines the basic principles and requirements applicable to all suppliers of goods and services, their subcontractors as well as the group entities of suppliers and subcontractors as regards their responsibility towards society, the environment and the individuals involved in the production of goods and the rendering of services. These obligations embrace the recognition of the ISO 26000 Guidance on Social Responsibility, compliance with international standards, respect for human rights – including the prohibition of child and forced labor as well as discrimination – fair wages and working hours, freedom of association as well as health and safety at work.

Furthermore, the Code of Conduct lays down the obligations to engage in environmentally sound management, dispense with the use of conflict minerals, honor the principles of fair competition, respect data privacy, protect intellectual property while also enshrining compliance with foreign trade acts as well as the ban on corruption, bribery and money-laundering. When GEA becomes aware of or suspects violations of the Code of Conduct, with GEA notifying the respective supplier accordingly, GEA expects said supplier to investigate and resolve such non-compliance issues as quickly as possible and within an agreed timeframe. Should the supplier be unwilling to fix such problems, GEA reserves the right to take legal action as deemed appropriate by the company, including measures aimed at terminating the business relationship for good or any action designed to promote, follow up on and enforce corrective measures.

Key suppliers are visited on an annual basis and also regularly checked for adverse social impacts. In the year under review, the company conducted 426 supplier screenings (previous year: 492). GEA performs these evaluations by visiting sub-suppliers, conducting audits or requesting the voluntary disclosure of information; these activities have been undertaken by the country organizations and, until recently, the Business Areas – going forward: Divisions – alike.

All purchases (direct and indirect expenses) are covered by the Code of Conduct. The latter must be accepted by the supplier in order to complete the purchase when the following threshold amounts set forth in the Third Party Policy are exceeded: EUR 2,500 for individual orders, EUR 10,000 for longer-term contracts. GEA approves a supplier when the Code of Conduct for Suppliers and Subcontractors is an integral part of a supplier agreement (on a local, regional or global level), for instance as an annex, or of a purchase offer – as an attached document and/or a as a link – and the supplier accepts the order by submitting an order confirmation. It is the permanent responsibility of the Global Procurement Council to inform all GEA companies as well as all purchasing managers in all regions and divisions about their responsibility for implementing the Code of Conduct for Suppliers and Subcontractors within the framework of the defined process. Any acceptance of the Code of Conduct by a supplier or subcontractor must be documented. Should a supplier refuse to commit to the Code of Conduct, the respective supplier must promptly submit a written statement in which they detail and specify the basic principles/commitments they adhere to. This statement needs to be accepted by GEA's local legal/compliance officer. Should the latter refuse to do so, the process will be further escalated on the basis of an established procedure. Compliance with the Code of Conduct for Suppliers and Subcontractors is verified and checked as part of the supplier audits that are performed at regular intervals.

Suppliers in countries carrying risks for human rights

Although GEA is usually seeking to ensure full compliance with the Code of Conduct for Suppliers and Subcontractors, the human rights situation in some countries calls for specific attention. Based on a multi-index approach, GEA currently rates 21 countries as critical. For this purpose, the company combines the assessments of four well-known indices:

- "Freedom in the World," issued by Freedom House, an American non-governmental organization
- "Index of Economic Freedom," published by the Heritage Foundation and The Wall Street Journal
- "Press Freedom Index," published by Reporters Without Borders
- "Democracy Index," released by the Economist Intelligence Unit (EIU), a private company based in Great Britain

In its assessment, GEA has also taken into account the OECD membership of the countries with the lowest score in at least one of the four indices. In terms of value, GEA sources approximately five percent of its total purchasing volume from human rights priority countries. Suppliers and subcontractors accounting for 97 percent of this critical volume have accepted the Code of Conduct. GEA puts a lot of effort into ensuring that all critical countries are covered by the Code. This is to be followed by regular audits with a special focus on compliance with human rights in these countries.

National Business and Human Rights Action Plan

To further improve its record when it comes to meeting the requirements under the National Business and Human Rights Action Plan (NAP Business and Human Rights), and for the purpose of optimizing its concepts and due diligence processes, GEA set up a special human rights project that was conducted with the support of external consultants in the year under review. The respective results will be implemented in the 2020 fiscal year.

SMETA audits

In addition to the five SMETA audits already conducted, GEA will perform further audits, the first of which already took place at the German site in Oelde in the year under review. SMETA, the Sedex Members' Ethical Trade Audit, outlines an audit procedure based on best practice in the field of corporate social responsibility. It takes into account the respect for human rights, health and safety, environmental sustainability as well as business integrity. At the same time, SMETA defines a uniform reporting format to ensure that the information provided is meaningful and allows comparability. Each audit report is entered into the Sedex (Supplier Ethical Data Exchange) database. According to Sedex, the international platform has more than 60,000 members from 180 countries and 35 industries and seeks to support enterprises in the fields of supplier management and risk mitigation.

Responsible value creation

All stakeholder groups expect GEA to show economic strength. The latter guarantees safe jobs, efficient and innovative products, reasonable shareholder value and safe investments, value creation even outside the company as well as social engagement.

In turn, this is inextricably linked with correct behavior. In the quest for sustainable value creation, corporate governance constitutes an essential element of corporate management that bears on every aspect of the group's day-to-day operations and activities.

Under the heading of "Human rights" (see page 145 f.), GEA provides information on human rights and other social issues related to the supply chain, while environmental aspects in the supply chain are covered in the section on "Environmental responsibility" (see page 129).

NFS

Compliance management

Compliance represents a group-wide principle set up to ensure adherence to the rule of law as well as internal corporate policies. All GEA employees are obliged to make sure that no compliance violations are committed in their respective areas of responsibility. A detailed outline of GEA's Compliance Management System can be found in the Corporate Governance Report (see page 76 ff.) and at gea.com.

To avoid the serious consequences of potential compliance violations, GEA manages these risks by means of a compliance management system designed for analysis, information and awareness raising, control, process definition as well as monitoring purposes, revised in the year under review. The new system was audited in accordance with audit standard IDW PS 980 as of December 31, 2018, with the audit being certified on January 29, 2019. In addition, there is a certified reporting system ("Business Keeper Monitoring System," BKMS). The management approach is verified via internal and external audits conducted by Group Internal Audit and/or external auditors.

New Code of Conduct

In July 2018, GEA's Executive Board adopted the new "Code of Conduct" as well as Compliance Policies based thereon – including the Integrity Policy, the Third-Party Policy as well as the Competition Policy. The Code of Conduct supersedes the former "Business Conduct Policy." The corresponding provisions entered into force throughout the group on January 1, 2019. The above policies govern the fight against corruption and money-laundering, conflicts of interest as well as antitrust and competition law at GEA. They are available to all employees worldwide in 18 different languages. Further details are outlined in the Corporate Governance Report, see page 77.

Reporting system and alternative reporting channels

GEA's BKMS reporting system represents a tool designed to ensure compliance with the Code of Conduct. It is available to employees and third parties in nine different languages and provides the possibility of filing IT-based reports of potential violations of laws and provisions governing the prevention of corruption and competition restrictions. Such reports may remain anonymous in countries where this is permitted by law. Only two dedicated employees of the "Compliance and Principle Legal Matters" department as well as one member of the Internal Audit team may access reports on corruption and competition restrictions. GEA's Integrity System also allows for reports on potential human rights violations (category: violation of the principles of social responsibility under the Code of Corporate Responsibility) being filed (see page 144 f.).

Employees and third parties may also report alleged violations by choosing other channels. For instance, GEA receives reports that are submitted via e-mail or letters addressed to the Executive Board, members of the compliance organization or the Head of Internal Audit. It is common practice and stipulated in a policy that the recipient promptly passes such reports on to dedicated members of the compliance organization.

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Preventive processes

Processes designed to prevent compliance violations figure prominently in GEA's compliance management scheme. For this reason, individuals in close contact with the customer, such as sales agents, have to undergo a strict risk vetting process for the purpose of corruption prevention prior to entering into a contract with GEA. Each sales agent contract requires prior verification and approval by the legal department. Numerous other matters, such as contracts carrying antitrust risks, invitations and gifts, conflicts of interest as well as sponsoring and donations are subject to strict internal approval and reporting requirements.

Training and consulting

GEA has identified more than 4,000 employees that are exposed to particular compliance risks. As far as anti-corruption and antitrust law are concerned, this group includes all executives, all employees entrusted with sales or purchasing tasks as well as other employees vested with decision-making powers and in direct contact with customers or suppliers. These employees are to receive face-to-face training in the fields of anti-corruption and antitrust law at least once every two years.

Once again, the year under review saw the continuation of compliance training courses:

- Compliance training courses comprise extensive group training covering topics like the fight against corruption and money-laundering, antitrust law as well as conflicts of interest; in the years 2018/2019, the company initiated a worldwide training program on the above topics for approximately 4,000 employees, and by the end of the year, more than 2,800 of them had already undergone this specific training.
- In addition, 2019 saw the delivery of further compliance e-learning courses with a focus on anti-corruption, antitrust law, money-laundering as well as data protection. All employees from the target groups at risk were invited to attend. The group included 6,699 invited participants in the field of anti-corruption, 6,207 for antitrust law, 6,010 as regards money-laundering and 14,773 employees dealing with matters of data privacy.

Local Compliance Managers are appointed for all legal entities whose units operate and manage their own business, i.e. generate sales and/or have employees. At regular intervals, they receive intensive fraud prevention, anti-corruption, money-laundering and antitrust training. They serve as points of contact in relation to local compliance issues and assist the compliance department in its endeavors.

Audits

Within the framework of its standard and special audits, Group Internal Audit also checks compliance aspects. In the year under review, the team performed 25 audits at GEA sites worldwide. Group Internal Audit is tasked with protecting corporate assets, verifying process efficiency and compliance, as well as checking the completeness of documentation. This also includes compliance audits in the fields of anti-corruption and export control. In the year under review, Internal Audit performed additional audits focusing on Executive Board travel expenses as well as audits looking into the risk management systems of both Business Areas as well as that of the Global Corporate Center.

Reporting profile

Once again, GEA's sustainability report for the 2019 fiscal year follows the international standards of the Global Reporting Initiative (GRI). The report was prepared in accordance with the "core option" of the GRI Standards.

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On behalf of GEA's Supervisory Board, KPMG AG Wirtschaftsprüfungsgesellschaft reviewed GEA's combined non-financial consolidated statement for fiscal year 2019 and performed a limited assurance engagement in relation to the statutory disclosures required pursuant to sections 315b, 315c in conjunction with section 289b to 289e HGB (Handelsgesetzbuch – German Commercial Code). This review was in line with the applicable "International Standard on Assurance Engagements" (ISAE) 3000 (Revised): "Assurance Engagements other than Audits or Reviews of Historical Financial Information," see Disclosure 102-56.

Disclosure 102-45

Unless indicated otherwise, the disclosures basically comprise the worldwide activities of the overall group, i.e. GEA Group Aktiengesellschaft including all companies over which GEA can exercise controlling or material influence. A list of the subsidiaries, associated companies and joint ventures meeting this definition can be found in the list of shareholdings included in section 12.4 of the Consolidated Notes.

Disclosure 102-48

No restatements were made; however, the essential topics were revised and re-defined, see Disclosure 102-49.

Disclosure 102-46

Following the comprehensive materiality analysis and risk assessment conducted in 2018, GEA's Corporate Responsibility as well as the Communication, Marketing & Branding departments held a full-day workshop with external consultants in the year under review for the purpose of scrutinizing GEA's economic, ecological and social impact on the topics defined for the year 2019. The main objective was to once again thoroughly discuss and redefine the scopes as well as the reporting boundaries of the individual topics. As a result, it can be stated that the materiality analysis has remained valid in its entirety; nonetheless, a few key areas were refocused while other topics were merged for the sake of clarity. Finally, the result was discussed with GEA's entire Executive Board and adopted.

To identify the topics to be reported in the non-financial statement, GEA also checked an additional prerequisite in line with section 315c in conjunction with section 289c (3) HGB, i.e. whether a specific topic is required for understanding GEA's business progress, business results as well as the situation of the company (net assets, financial position, result of operations). Potential risks arising in connection with these topics were identified, allocated and assessed.

Disclosure 102-42

Internal experts represented the most important source when it came to defining and engaging external stakeholders.

Disclosure 102-40

As a listed company with a shareholder structure characterized by the presence of institutional investors – without a dominant major shareholder – GEA defined the classic stakeholder group, i.e. the "shareholders," as "investors." Apart from (potential) investors, this group also includes shareholders, analysts, investment firms as well as rating agencies. All in all, GEA identified the following stakeholders, re-classified in the previous year:

- Investors
- Employees
- Customers
- Industry/peer group (including suppliers)
- NGOs/civil society
- Sustainability experts (scientific community, consultancies)
- Authorities/political sphere

Disclosure 102-43

For the purpose of corroborating the materiality analysis, the company once again analyzed various sources, including the results of the staff engagement and customer satisfaction surveys conducted in 2019. In addition, the capital market's response (notably ratings and ESG analysts) to the company's sustainability reporting was one more time subjected to a thorough analysis together with the CR&QHSE experts in 2019. Taking into consideration their requirements, the company decided to continue and even expand its reporting on water consumption and waste, although, overall, these topics are not regarded as material. Every year, GEA participates in the Climate Change Information Request of the Carbon Disclosure Project (CDP). The respective documentation was also taken into account. Moreover, the sustainability reports drawn up by key customers and competitors were also given due regard within the framework of a comparative analysis.

Disclosure 102-47

The company's reporting in 2019 addresses the following material topics:

- Procurement
- Compliance, in particular anti-corruption
- Greenhouse gas emissions
- Supplier environmental assessment – responsible supply chain
- Employment
- Health and safety at work
- Diversity and equal opportunities
- Human rights (social assessment of suppliers)
- Socio-economic compliance including data privacy
- Sustainable engineering

Disclosure 102-49

The following topics have changed and/or were re-defined:

Topic in 2018	Topic in 2019	Reason(s) for change
Responsible supply chain	Supplier environmental assessment	Allocation to environmental matters.
Labor relations; working conditions, including learning and development	Employment	Employment is essential for competitiveness. In terms of its significance and impact on the organization, it is a superordinate of the (already reported) topics of co-determination as well as learning and development, while also including them as partial aspects.
Social assessment of suppliers; human rights screening	Human rights (social assessment of suppliers)	The 2019 materiality analysis has clearly revealed that human rights risks are relevant, in particular as regards the supply chain; for this reason, reporting on the supply chain has been more detailed. Reporting on human rights management within the organization remains unchanged and/or is expanded in line with the NAP Business and Human Rights.
Data protection	Socio-economic compliance, including protection of personal data	Editorial clarification of existing correlations.
Product quality and safety; sustainable product design and innovation; product lifecycle/circular economy; customer information and support; information security; protection of intellectual property	Sustainable engineering	The topics identified in 2018 remain valid, but are summarized for the purpose of enhanced reporting clarity. For GEA it is crucial to optimize the impact of its products and solutions (outside the organization) under economic, environmental and social aspects while taking into account the respective risks and opportunities. This section includes topics like security as well as the protection of information and intellectual property. This is what GEA understands by "sustainable engineering."
Value creation	Not applicable	Included in the Report on Economic Position.

Disclosure 102-44

This overview shows which individual aspects stakeholders give particular high priority:

Assessment of the materiality of individual aspects by stakeholders	Investors	Customers	Industry/ peer group	NGOs/ civil society	Sustainability experts (scientific community, consulting)	Authorities/ political sphere	Employees
Procurement			•	•		•	
Compliance, in particular anti-corruption	•	•	•	•	•	•	•
Greenhouse gas emissions	•	•	•	•	•	•	•
Supplier environmental assessment	•	•	•	•	•	•	•
Employment	•			•			•
Health and safety at work	•	•	•	•		•	•
Diversity and equal opportunities	•			•		•	•
Human rights (social assessment of suppliers)	•	•	•	•	•	•	•
Socio-economic compliance including protection of personal data	•				•	•	•
Sustainable engineering	•	•	•		•	•	•

Report on Risks and Opportunities

Risk and opportunity management targets

GEA's ability to leverage its growth and earnings potential depends on its ability to exploit the opportunities that present themselves. Fundamentally, this gives rise to entrepreneurial risks. Taking calculated risks is therefore part of GEA's corporate strategy. To meet the objective of steadily increasing enterprise value, it is necessary to enter into only those risks that are calculable and matched by greater opportunities. This requires active risk and opportunity management that indicates and avoids risks to the continued existence of GEA as a going concern early on, monitors and manages assumed risks, and ensures that opportunities are identified and utilized in good time.

GEA's medium-term planning is a key component in its approach to managing opportunities and risks. This process is used to prepare decisions on core technologies and markets, along with the corresponding allocation of resources. The objective is to ensure stability by diversifying and by concentrating on markets of the future. At the same time, developments that may jeopardize GEA's continuing existence should be identified at an early stage.

Opportunities and risks arising from significant operating decisions – for example by accepting certain orders or implementing capital expenditure projects – are assessed and hence actively managed by the relevant departments and decision-makers at all group levels and in all functional units in a decision-making process that takes materiality criteria into account.

Overall assessment of the risk position and changes compared with the previous year

The identified risks from operating activities and the negative impact on earnings that could result did not worsen to any significant degree compared with the previous year. The measures introduced by GEA in 2019 will, however, engender opportunities as well as risks.

The structure of GEA with its regional and sectorial diversity continues to offer substantial protection against a series of individual risks conjoining into a single risk that poses a threat to the group's continued existence as a going concern. In addition, GEA Group is not significantly dependent on individual business partners, whether suppliers or customers.

The sale of the GEA Heat Exchangers segment resulted in risks in the form of financial obligations towards the purchaser arising within discontinued operations.

Overall, no risks to GEA or GEA Group Aktiengesellschaft were identified that, alone or in combination with other risks, could endanger the company's continued existence as a going concern.

Risk and opportunity management system

All group companies are integrated into GEA's risk management system. Quarterly risk reports and size-related ad hoc risk reports aim to ensure that decision-makers at all levels are informed promptly about material existing risks and potential risks affecting future development.

The fundamental principles and procedures underpinning an effective risk management system are set out in risk guidelines that apply to the entire group. This guideline also documents mandatory risk reporting and management requirements. Compliance with these requirements is monitored regularly by the Internal Audit function.

Risk management instruments such as the Risk Assessment and Advisory Committees (RAACs) are supplemented by a reporting system encompassing evaluated risk reports, consolidated financial projections, monthly consolidated financial statements, and regular meetings of the Global Leadership Team (consisting of members of the Executive Board and heads of the Business Areas, the regions, and the Global Corporate Center) enable the various risks to be identified and analyzed.

Risk management organization

GEA's risk management system is based on the management hierarchy. Risks are reported to the next higher management level using predefined thresholds.

The specific requirements of the group's project business are addressed by risk boards at business area and group management level. Before a binding quotation is submitted or an agreement signed, the commercial and contractual terms of potential orders are examined in detail by specialists from various departments so that risks that cannot be controlled are avoided. The risk management system therefore already comes into play before risks arise, in the form of a critical examination of the opportunity and risk profile of quotations. No agreement may be signed if the opportunity and profile are inappropriate.

The risk management system not only serves the statutory purpose of identifying existential risks as early as possible, it also covers all risks that might have a material impact on the financial position and results of operations of a business area or of the group as a whole.

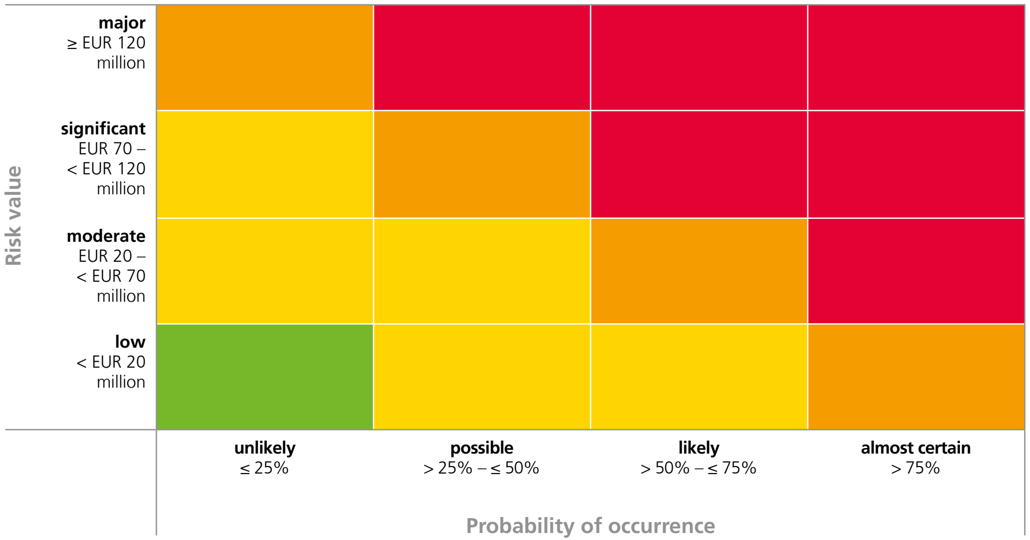
To identify risks that could endanger the existence of GEA as a going concern, all issues are assessed for their financial materiality and probability of occurrence. This is done on a gross basis, i.e. excluding any risk-mitigating measures. In addition, the timing (less than or more than one year) of each risk is individually assessed. The assessment of risks and opportunities is based on a 12-month period. This period is also the forecast horizon.

The "GEA Business Climate" (GBC) is used to collate estimates by GEA's market experts of current and short-term market developments. The questionnaire makes it possible to obtain an early indication of positive or negative market trends in the industries and regions that are relevant for GEA.

In the year under review, the concept behind GEA's current risk and opportunity management system was extensively reworked. GEA revised its risk strategy, adding a new concept for measuring risk-bearing capacity. The existing risk and opportunity categories were updated and new ones added. The risk and opportunity matrix was refined by switching from the 3-level matrix of classifying probability of occurrence and financial impact to a 4-level system. As part of this change, internal reporting thresholds were also reviewed and adjusted to some degree. In the future, the parameters of the risk and opportunity matrix and the reporting thresholds will be reviewed on an annual basis and, where necessary, adjusted.

Used for the first time in the 2019 Annual Report, the following parameters apply to the new risk and opportunity matrix. Net risks are shown taking into account countermeasures.

Risks and opportunities matrix



GEA's new divisional structure introduced at the start of 2020 was taken into account when revising the risk and opportunity management system. As this system is implemented in the course of the 2020 fiscal year, a new risk and opportunity management software will be rolled out too.

Adequate provisions have been recognized for all identifiable risks arising from the group's operating activities provided that the recognition criteria for liabilities have been met. The following section provides details of existing risks. Measurement is conducted on the basis of the new risk and opportunities matrix. Risks that are not yet known or currently regarded as insignificant may also have an adverse effect on business activities.

Internal control system

GEA's internal control system (ICS) is based on the COSO framework and comprises the risk management system (RMS) as well as other principles, measures, and rules (other components of the ICS). While the RMS aims at identifying and classifying risks, the components comprising the rest of the ICS serve primarily to prevent or mitigate risk using control measures. The Internal Audit function is another component of the ICS.

The RMS comprises principles, measures, and rules relating to the early risk recognition system in accordance with section 91(2) of the Aktiengesetz (AktG – German Stock Corporation Act), as well as those relating to other components of the risk management system. In the other components of the ICS, a distinction is made between principles, measures and rules that are related or unrelated to financial reporting.

GEA's ICS relevant for financial reporting encompasses all principles, measures and rules that ensure the proper approval and recording of business transactions for monthly, quarterly, and annual financial statements. The goal of the implemented ICS is to ensure reliable financial reporting, compliance with the relevant laws and standards, and the cost-effectiveness of business workflows.

In addition to GEA Group Aktiengesellschaft, all group companies are integrated into the ICS.

In order to ensure that uniform procedures are established throughout the group, the following key principles of GEA's ICS must be applied in all business functions: clearly defined areas of responsibility, the separation of functions in all areas of activity, dual signature policies, compliance with guidelines, instructions, and procedural requirements (manuals), the obligation to obtain comparative offers before awarding contracts, protection of data from unauthorized access, and the holding of training sessions.

Key measures and rules that are relevant for financial reporting and are designed to ensure uniform accounting at all subsidiaries are: accounting and account allocation manuals, a uniform chart of accounts, consolidation and calculation manuals, the approval of entries using the dual control principle, and the fact that certain entries can only be made by selected persons. Guidelines and IT systems are updated on a continuous basis to reflect legal and business requirements. The IT Security Officer is responsible for implementing appropriate IT guidelines throughout the group based on regulatory and substantive requirements.

Compliance with the principles, measures, and rules set out in the ICS as described above is monitored systematically; this takes the form of regular reviews by GEA's Internal Audit function, which reports directly to the Executive Board and regularly submits reports to the Audit Committee. The results enable the elimination of defects identified at the companies reviewed and the ongoing enhancement of the ICS in the group.

Overall, the ICS aims to ensure the early identification, assessment, and management of those risks and opportunities that could materially influence the company's ability to achieve its strategic, operating, financial and compliance-related objectives.

Risks

Legal risks

Individual legal risks are not quantified in detail since disclosing the specific probability of occurrence could have a material effect on the group's position in current litigation or other legal disputes.

Dörries Scharmann AG

The former Metallgesellschaft AG, the legal predecessor to GEA Group Aktiengesellschaft, held an interest in Schiess AG, which later became Dörries Scharmann AG. On the basis of that interest, the insolvency administrator has asserted since 1996 various claims under company law, in particular for equity substitution, amounting to approximately EUR 18 million plus interest in the first instance. In the second instance, the Higher Regional Appeal Court of Düsseldorf in its final judicial ruling ordered GEA Group Aktiengesellschaft to pay EUR 3.4 million plus interest (EUR 4.6 million). In turn, the payment of these amounts to the insolvency administrator triggered the disbursement of a trust deposit of around EUR 1.9 million to GEA. The claim to this trust deposit arose from the award (dated November 22, 2001) in previous arbitration proceedings between the insolvency administrator and Metallgesellschaft AG.

Siliconform Rechteverwertungs GmbH

An action for patent infringement brought by Siliconform Rechteverwertungs GmbH against GEA Farm Technologies GmbH is pending before Düsseldorf Regional Court. Siliconform Rechteverwertungs GmbH has lodged a claim for the alleged infringement of its patent EP 1 950 022, a procedure and equipment for manufacturing the preform for a milking liner. GEA Farm Technologies considers the action and the asserted claims – including for an injunction and damages – to be unfounded and will defend itself using all legal means at its disposal.

Steuben Foods Inc.

GEA Process Engineering, Inc. ("GPNA") and GEA Procomac SpA ("Procomac") are defendants to a lawsuit filed by Steuben Foods Inc. ("Steuben") in the U.S. District Court of the Western District of New York. In its complaint, Steuben is alleging that GPNA and Procomac infringed its patents by selling eight bottling lines to customers in the United States; Steuben seeks unspecified damages. GPNA and Procomac intend to vigorously defend themselves and deny infringement of any valid and enforceable patent claims.

Farm Technologies distributor for South Korea

In an action brought before the District Court in Seoul, GEA Farm Technologies GmbH was sued by its former distributor in South Korea (Sesame W.S. Trading Corporation) and its owner Do Ki Yang for the alleged unlawful termination of a dealership agreement and payment of damages initially equivalent to around EUR 2.3 million, and equivalent to around EUR 28 million plus interest in the final instance. However, the High Court in Seoul (court of appeal) found that the losses incurred by the distributor amounted to the equivalent of only around EUR 670 thousand plus interest. The dispute is currently being heard before the Seoul Supreme Court. GEA Farm Technologies GmbH expects that the Supreme Court will uphold the judgment of the court of appeal. Alongside this first action, the distributor then brought a second action relating to the same matter but for a different period, successively raising the claim for damages to EUR 24 million plus interest in the final instance. This second action is currently suspended.

General remarks

Further claims or official investigations have been or may be instituted against GEA companies as a result of earlier business disposals and operating activities.

Adequate accounting provisions have been recognized for all risks arising from both the legal disputes described above and other legal disputes being pursued by GEA in the course of its ordinary operating activities. However, the outcome of these proceedings cannot be predicted with any degree of certainty. It is therefore possible that the conclusion of the proceedings may result in income or expenses if the amounts that have been set aside for them are higher or lower than required.

Overview of all material risks to which GEA is exposed (not including legal risks)

Significant risks	Probability (net)	Financial implications (net)
Performance risks		
Macroeconomic trends	Likely	Moderate
Coronavirus (Covid-19)	Possible	Moderate
Trade dispute between China, the U.S. and the EU	Likely	Low
Brexit	Possible	Low
Fluctuating material prices	Unlikely	Low
Financing options of customers for projects	Unlikely	Low
Margin risk for long-term orders	Possible	Moderate
Innovative strength	Possible	Moderate
Digitalization	Unlikely	Moderate
Finding and holding on to dedicated and qualified employees	Possible	Moderate
IT infrastructure	Unlikely	Moderate
Information technology	Possible	Significant
Acquisition, divestment, and integration risks		
Acquisitions and divestment	Likely	Low
Reorganization	Likely	Moderate
Sale of the GEA Heat Exchangers segment in 2014	Possible	Moderate
Environmental risk		
Historic environmental contamination and mining damage	Possible	Moderate
Financial risks		
Currency, interest rate, credit, and liquidity risk	Unlikely	Low
Tax risks		
Option of using loss carryforwards	Unlikely	Major

Performance risks

The performance risks presented below can take different forms. The elements of the GEA risk management system are designed to help identify emerging risks before they materialize, so that appropriate measures can be implemented on a case-by-case basis to avoid negative effects on the group's financial position and results of operations. As a rule, potential business performance risks are to be minimized by avoiding significant dependencies and ensuring a balanced mix of fixed and flexible capacities.

Macroeconomic trends are deemed to pose a risk to the company. If a downturn in the economy leads to a reduction in order intake and selling prices to below the level of the previous fiscal year, this could have a negative impact on earnings due to capacity underutilization and capacity adjustment measures. GEA has a diverse product and customer structure that is geared to flexibility. This tends to moderate the impact on total performance of any fluctuations in demand in specific submarkets. However, products for the food industry – notably the dairy farming and processing market – remain the main focus of our business. All told, the financial impact of this risk is likely to be moderate in severity.

Macroeconomic growth – notably in the Asia Pacific region but also, according to the latest data, in Europe – could also be compromised by the coronavirus (Covid-19), which is spreading rapidly at the present time. In addition to production outages resulting from temporary site closures by order of the authorities, GEA could also be hit by a decline in order intake and revenue, primarily in China, South Korea, and Italy as things currently stand. Although the overall impact cannot be reliably quantified at the present time, it is considered possible that GEA's business will be adversely affected to a degree over and above the effects already incorporated into the outlook for 2020. The consequence would be an additional negative impact on earnings. The resulting financial implications are rated as moderate.

The ongoing trade discussions between China, the United States and the European Union affect the most important markets for European suppliers. Only a few of GEA's product categories are affected by additional customs duties, so the financial impact of punitive tariffs on reciprocal trade has been negligible to date. Indeed, even if customs duties were expanded further (which is regarded as likely), the potential financial implications would be rather low. The financial impact would, however, be significantly greater in the event of a global escalation of the trade disputes, in which case GEA would be far less able to exploit its global production network and avoid higher duties. However, in light of the progress in the negotiations between China and the U.S. at the start of 2020, there are currently no indications that this is to happen.

On March 29, 2017, the UK government formally triggered Article 50 of the Treaty of Lisbon and notified the European Council that the UK intended to leave the EU (Brexit). Both sides have formally agreed that the UK will leave the EU on January 31, 2020. The withdrawal agreement provides for a transitional period up to December 31, 2020, during which the terms of the UK's exit and the future relations between the United Kingdom and the EU are to be agreed. By and large, the UK will continue to abide by EU laws during this period and will also remain a member of the Single Market and the Customs Union. The UK and the EU can jointly agree once to extend the transitional period by a further period of up to two years. There continues to be considerable uncertainty as to the withdrawal process itself and the outcome of negotiations on future relations between the United Kingdom and the EU. As a consequence, there is likewise great uncertainty with regard to the period of time during which current EU legislation of Member States will continue to apply to the United Kingdom, and which laws will remain valid for the United Kingdom after its withdrawal. Following the negotiations between the United Kingdom and the EU, the United Kingdom's tax status may change, and this could affect GEA. It is not currently possible, however, to determine whether or not the UK's tax status will change – and if so, how and when. At the present time, GEA does not foresee any specific substantial increase in taxes due to the withdrawal process, since existing bilateral tax treaties (such as double taxation treaties) are expected to remain in place and there have been no changes to taxation policies in the United Kingdom. The UK's exit could, however, lead to significant changes in legal formalities. Corresponding risks could arise for GEA as well, depending on the ultimate structure of Brexit, but the company has already defined and prepared appropriate countermeasures. Inventories are being monitored to mitigate the effects of delays in customs clearance, for example, and IT systems can be adapted at short notice to meet the new requirements. From an operational perspective, it is uncertain how UK customers will behave. It is particularly unclear just how much sales revenue could decline in the United Kingdom and how costs could increase for exporting goods to British customers. At present, the group's activities between the United Kingdom and the EU, which are relevant to Brexit, are of minor importance. Now that the UK has officially left the EU on January 31, 2020, GEA rates the likelihood of negative effects beyond the end of the ultimate transitional period as possible. However, GEA expects the financial impact to be low.

GEA utilizes a number of materials such as aluminum, copper, nickel, zinc and stainless steel – the latter notably in the manufacture of processed products. Purchase prices for these materials may fluctuate significantly depending on market conditions. Long-term supply agreements are entered into with selected suppliers in order to lock in the procurement prices used as the basis for costing orders. The risk of higher material prices developing is considered unlikely. Long-term supply agreements and the option of adjusting selling prices lead us to rate the potential financial impact here as low.

A significant proportion of GEA's business consists of projects that depend on the financing options of its customers. A general decline in demand, shifts in currency parities, or a credit squeeze could make it more difficult to implement such projects. For the same reason, existing orders could be deferred or even canceled. That such risks will materialize on a global basis is considered unlikely. All told, the financial impact of this risk is classified as low – notably due to GEA's broad-based structure and positioning.

Long-term orders for customer-specific projects are an important element of GEA's business. Some of these contracts entail particular risks, as they involve assuming a significant portion of the risk associated with the project's completion. The high percentage of innovative products in the GEA range can also harbor technological risk. This is particularly the case with the complex solutions, plant and equipment produced by the Business Area Solutions – which, on account of their size and/or customized design, cannot always be tested in their entirety prior to roll out. In addition, they may provide for warranty obligations that remain in force for several years after the project's acceptance. Technical problems, quality problems at subcontractors, and missed deadlines may lead to cost overruns. There is therefore an extensive risk management system in place at group management and business area level to closely monitor order-related risks. This comes into play before binding quotations are submitted. Adequate provisions have been recognized for all foreseeable risks in this area. That such risks will materialize is considered possible. Particularly due to the multi-stage approval process necessary in advance of a binding quotation being submitted or an agreement signed, the financial effects of this risk are rated as moderate.

The enduring financial success of GEA as a technology group depends to a large extent on it being able to offer tailored customer solutions that provide outstanding product and process efficiency. For this reason, GEA needs to maintain and continually expand its innovative strength. Despite intensive R&D activity and concerted efforts on our part to develop existing technology, there is still a risk that in some areas, new and existing competitors will bring products with better performance parameters to market maturity faster. This risk is rated as possible, with moderate financial implications for GEA.

Digitalization is an integral part of GEA's innovation process, aiming to develop plant and processes that can be adapted flexibly to changing market conditions. In addition, internal GEA processes require further digitalization in order to enable fast, reliable information-gathering for the management of both production and administrative processes. In this area, GEA sees risks and opportunities for the optimization of internal processes. If these internal processes cannot be digitalized quickly or comprehensively enough, this may give rise to competitive disadvantages for GEA for a limited period. It is unlikely that this risk will materialize; the potential financial implications are estimated to be moderate.

Dedicated and qualified employees are a critical success factor for GEA. GEA has various staff policy measures in place to counter the risk that it will be unable to fill vacant positions adequately or that it will lose skilled employees. The measures aim to position GEA as an attractive employer and foster employees' long-term loyalty to the group (see page 139 ff.). The probability that vacant positions will not be filled adequately and permanently is rated as possible, with moderate financial implications for the group.

GEA's business processes are highly dependent on its IT infrastructure. Whether caused by internal or external events, the failure or malfunction of critical systems can give rise to risks relating to confidentiality, availability, and integrity, and key business processes could be compromised. Extensive infrastructural measures have been taken to minimize operational risks and it is therefore seen as unlikely that they will occur. The possible financial impact would be moderate.

Where economically viable and technically feasible, GEA protects its IT systems against unauthorized access. The relevant security systems and processes are updated on an ongoing basis. Despite these measures, however, the permanently changing potential threat situation means that it is possible that these risks will materialize in the future. Potential financial impacts are rated as significant.

Acquisition, divestment, and integration risks

Acquisitions, divestments, and internal reorganization give rise to risks from the integration of employees, processes, technologies, and products. It cannot be ruled out, therefore, that the aims of the measures in question will be not fully achieved or realized within the time frame envisaged. Moreover, such transactions may give rise to substantial administrative and other expenses. Portfolio measures may also result in the need for additional finance and thus may impact negatively on financing requirements and the financing structure. These risks are countered by a structured integration concept and close supervision by internal experts, as well as specific training measures. Risks arising from acquisitions and divestments are rated as probable with little financial impact, whereas the risk emanating from reorganization is considered likely with moderate financial implications for the group.

The sale of the GEA Heat Exchangers segment resulted in risks in the form of financial obligations towards the purchaser. These emanate mainly from risk sharing for a major project still in progress. All told, the probability of this risk arising is estimated as possible, with moderate financial implications should it materialize.

Environmental risk

Several of GEA's properties entail risks relating to historic environmental contamination and mining damage, primarily as a result of earlier business activities. These risks are countered through appropriate measures and supervision by internal and external specialists. This could give rise to both risks and opportunities in relation to the financial position and results of operations. Their probability is regarded as possible and the financial impact as moderate.

Financial risks

Because it operates worldwide, GEA is continuously exposed to financial risks in the course of ordinary activities. The Executive Board has implemented an effective set of guidelines with which to monitor and thus largely limit or hedge these financial risks throughout the group. The objectives with regard to protecting assets, eliminating security shortfalls and enhancing efficiency when identifying and analyzing risks are clearly defined, as are the relevant organizational structures, powers and responsibilities. The guidelines are based on the principles of system security, separation of functions, transparency and immediate documentation.

The material financial risks include currency, interest rate, credit, and liquidity risk. Financial risk management aims to reduce this risk through the appropriate use of derivative and nonderivative hedging instruments.

Currency risk

Because GEA operates internationally, its cash flows are denominated not only in euros, but also in a number of other currencies, particularly U.S. dollars. Hedging the resulting currency risk is a key element of risk management.

The group guideline requires all group companies to hedge foreign currency items as they arise in order to fix prices on the basis of hedging rates. Currency risks are hedged for recognized hedged items, unrecognized firm commitments, and highly probable transactions. The hedging periods are determined by the maturity of the hedged items and are usually up to 12 months, but in exceptional cases may exceed that period significantly. Despite the hedging requirement, changes in exchange rates may affect sales opportunities outside the eurozone.

As a general rule, affiliated group companies are obliged to tender all outstanding exposures relating to transactions in goods and services in major transaction currencies to GEA's central Treasury and Corporate Finance unit. Most of these exposures are passed on directly to banks at matching maturities, depending on the hedging objective of the derivatives and the related accounting treatment. They may also be hedged as part of a portfolio. In addition, most intra-group borrowing arrangements in foreign currencies managed via the central Treasury & Corporate Finance unit are hedged directly to banks.

The hedging of financial transactions and transactions conducted by subsidiaries outside the eurozone is also coordinated with the central Treasury and Corporate Finance unit.

GEA companies are always exposed to foreign currency risk if their cash flows are denominated in a currency other than their own functional currency. As a general principle, foreign currency risks must be hedged using appropriate financial instruments so that fluctuations arising from the hedged item (underlying) and the hedging transaction are neutralized over their duration.

Interest rate risk

Because GEA operates worldwide, liquidity is raised and invested in the international money and capital markets in different currencies (but mainly in euros) and at different maturities. The resulting financial liabilities and investments are exposed to interest rate risk, which must be assessed and managed by central financial risk management. Derivative financial instruments may be used on a case-by-case basis to hedge interest rate risk and reduce the interest rate volatility and financing costs of the hedged items. Only the central Treasury and Corporate Finance unit is permitted to enter into such interest rate hedges.

Commodity price risk

GEA requires various metals such as aluminum, copper, and steel, whose purchase prices can be subject to substantial fluctuations depending on the market situation. Long-term supply agreements have been entered into with various suppliers in order to hedge commodity price risk.

Credit risk

The credit risk or default risk is the risk of a commercial partner no longer being in a position to meet obligations arising from a financial instrument or customer contract, with this event leading to financial loss. The Group is exposed to default risk from both its operative business (especially in the case of trade receivables) and its financing operations (including bank deposits, foreign exchange transactions and other financial instruments).

The maximum default risk is limited to the carrying amount of the financial instruments and the contract assets.

The financial standing of potential customers is ascertained via an internal risk board procedure before orders are accepted . Active receivables management, including nonrecourse factoring and credit insurance, is also performed. In the case of export transactions, confirmed and unconfirmed letters of credit are used alongside sureties, guarantees, and cover notes, including from export credit agencies such as Euler Hermes. An addition to local monitoring by the subsidiary, GEA oversees the main credit risks at group management level so that any accumulation of risk can be better managed. Since trade receivables and contract assets are usually due from a large number of customers spanning different industries and regions, there is no concentration of risk.

The counterparty limit system for cash and cash equivalents used by GEA for financial risk management aims to continuously assess and manage counterparty default risk. A maximum risk limit has been defined for each counterparty, which in most cases is derived from the ratings from recognized credit rating agencies and credit default swaps. Appropriate action is taken if the individual limit is exceeded. These measures serve to avoid a concentration of risks.

Cash and cash equivalents are deposited with banks and financial institutions rated BB- through AA- by Standard and Poor's (S&P) as of the reporting date.

Liquidity risk

GEA is exposed to liquidity risk in that it may be unable to meet payment obligations because it has insufficient cash funds at its disposal. GEA is responsible for managing this risk. The funds are made available to the companies by group management. Cash flow from operating activities is the most important source of liquidity. Cash pools have been established in 17 countries in order to optimize borrowing and the use of cash funds within GEA. To achieve this, the cash pools automatically balance the accounts of the participating group companies every day by crediting or debiting a target account at GEA Group Aktiengesellschaft. This prevents separate cash investments and borrowings by these companies to a large extent. Any additional liquidity requirements are generally borrowed by the GEA Group Aktiengesellschaft, which also invests surplus liquidity.

Capital management

GEA Group Aktiengesellschaft's key financial objective is to sustainably increase its enterprise value in the interests of investors, employees, customers, and suppliers, while safeguarding and securing the group's solvency at all times.

Improving profitability and, as a result, increasing the return on capital employed therefore takes priority in all business decisions. Our strict focus on contract margin quality is also derived from this. Equally, external growth through potential acquisitions is viewed from the perspective of this goal.

Capital management, in the form of generating sufficient liquidity reserves, plays a crucial role in the pursuit of these enterprise goals. Not only does it ensure GEA's long-term existence, it also creates the entrepreneurial flexibility needed to enhance and update current business activities and to take advantage of strategic opportunities. It is achieved by managing liquidity reserves and available credit lines on an ongoing basis using short- and medium-term forecasts of future liquidity trends and borrowing requirements.

The group's financial management encompasses liquidity management, group financing, and the management of interest rate and exchange rate risks. The central financial management operations within GEA Group Aktiengesellschaft are responsible for reducing financing costs as far as possible, optimizing interest rates for financial investments, minimizing counterparty credit risk, leveraging economies of scale, hedging interest rate and exchange rate risk exposures as effectively as possible, and ensuring that loan covenants are complied with. The goal of GEA's financing strategy is not only to be able to meet its payment obligations whenever they fall due, but also to ensure that sufficient cash reserves are always available in the form of credit lines, in addition to maintaining a strategic cash position. The centralized liquidity portfolio is managed mainly for capital preservation and risk reduction by diversifying the cash investments.

The capital structure is monitored regularly using various key financial indicators so as to optimize capital costs. Core indicators include the equity ratio and the net debt to equity ratio (gearing).

As the financial risks are limited or hedged through appropriate countermeasures, the risks for GEA's account are generally considered to be low in terms of financial impact and are unlikely to occur.

Tax risks

GEA's central tax department has issued guidelines to ensure that fiscal risks are identified and minimized in good time. These risks are examined and evaluated regularly and systematically.

The applicable national tax legislation may affect the use of loss carryforwards and thus the recoverability of the deferred taxes recognized in the consolidated financial statements and current taxation. Furthermore, future changes to the ownership structure could significantly reduce or even render impossible the use of German loss carryforwards (section 8c of the Körperschaftsteuergesetz (KStG – German Corporate Income Tax Act)). The ability to use U.S. loss carryforwards could also be restricted in the case of certain changes to the ownership structure of GEA Group Aktiengesellschaft under IRC section 382 (limitation on net operating loss carryforwards following an ownership change).

Moreover, in Germany and abroad, there is considerable uncertainty regarding future changes to, and the application of, tax legislation as a result of the pressure to reform and perceptibly greater scrutiny by the tax authorities.

The tax risks presented could have a major effect on GEA's financial position and results of operations. The occurrence of further material negative effects is considered to be unlikely.

Opportunities

Overall assessment of opportunities and changes compared with the previous year

GEA's end markets offer a variety of opportunities for positive business performance over the long term. A key task of the opportunity and risk management system is to systematically evaluate both internal and external information in order to identify opportunities at an early stage and appropriately assess the potential they offer (see page 152 ff.). With this in mind, GEA is working on a fixed raft of measures aimed at transforming opportunities into specific economic successes.

The identified opportunities from operating activities and the concomitant potential for additional earnings have not improved significantly, even in light of the new group structure as of 2020 (see page 38 f.) and the measures initiated in this regard.

Planning of the group's economic development is based on certain assumptions regarding the development of the performance parameters described below. If these parameters develop more positively than expected overall, this could have a corresponding effect on GEA's financial position and results of operations.

Opportunities arising from the measures initiated in 2019

Last year, the management of GEA initiated numerous measures aimed at strengthening the group again following several challenging years. They include the rolling out of a new organizational structure which, with the introduction of a Chief Service Officer (CSO) function for each division, underscores the significance of a stable and attractive service business for GEA. In addition, GEA is looking to optimize its global production footprint and procurement operations, sell selected business operations in the Farm Technologies and Refrigeration Technologies divisions, and standardize its ERP systems worldwide. In the course of restructuring, GEA aims to reduce its workforce by a total of around 800 FTEs by the end of 2020. GEA already factored the effects of these restructuring measures into its forecast for fiscal year 2020 and into the new medium-term group objectives up to 2022, which were published on September 26, 2019. Nevertheless, measures such as faster, more efficient project implementation could give rise to opportunities harboring potential for group-wide synergies. GEA considers it unlikely that the opportunities arising from the 2019 measures will exceed the planning assumptions and, therefore, have a positive impact on net assets, financial position and results of operations.

Performance opportunities

GEA is entering fiscal year 2020 with an order backlog that continues to be positive. Once again, GEA is expecting growth in the emerging markets, notably in India. In order to exploit this market potential, the company intends to further solidify its position in these countries.

In the area of process technology for food and beverages, GEA is expecting the trend toward high-quality end products to continue, largely fueled by a burgeoning middle-class population. The expected rise in production and quality standards coupled with innovative process enhancements and new process developments are also set to nurture growth at GEA.

What is more, GEA expects that the trend toward fewer, bigger dairy farms will increase the level of automation in such facilities. This should generate greater demand for automated milking systems. In the beverages industry, additional growth potential is expected to come from non-alcoholic, healthy beverages, especially in the Asia Pacific and North and Central Europe regions. In the pharma industry, GEA is counting on market growth above all in the USA and China.

GEA is anticipating disproportionate growth in service business compared with new machinery business, and is thus looking to improve its market coverage in developed markets even more. The establishment of a CSO in the management team of each division underscores the significance of service business for GEA in the new divisional structure, too.

Adding a “service enabler” to the harmonized customer relationship management (CRM) system will enable GEA to provide its customers with even better service, while promoting group-wide transparency in sales and marketing processes. This more prominent positioning of the entire portfolio aims to promote greater growth and nurture customer loyalty. In turn, this will continue to strengthen and expand GEA’s competitiveness.

A megatrend in all branches of industry, ongoing digitalization will make it possible to develop new products and business models, while the novel product ideas that result should give GEA a competitive edge and generate growth potential. GEA wants to deploy cloud-based machine learning, e.g. to fulfill the technical needs of its customers, in an effort to enhance efficiency and garner a competitive edge in its service business.

GEA’s in-depth understanding of its customers’ production processes is a cornerstone of its success. In addition, end consumers’ rising expectations entail the implementation of higher quality standards in production processes. Increasing environmental awareness means we must meet more stringent standards on CO_2 emissions and sustainability, for example. This creates additional opportunities for GEA: Research and development activities that target environmentally friendly technologies and production processes will enable us to develop and offer specialized solutions. For this reason, GEA intends to focus increasingly on holistic, energy-efficient process solutions. By doing so, GEA hopes to make more efficient use of raw materials and energy.

By further harmonizing its engineering platform, e.g. in the field of digital design, GEA hopes to engender even more efficient working practices when individual GEA sectors collaborate on inhouse projects. Increasing standardization at GEA, e.g. with new solutions for standard components, also harbors considerable potential for implementing technical projects even more efficiently in the future.

All told, GEA considers it unlikely that the opportunities arising from the 2019 measures will exceed the planning assumptions and, therefore, have a positive impact on net assets, financial position, and results of operations.

Report on Expected Developments

GEA's Report on Expected Developments takes into account relevant facts and events that were known at the date of preparation of these consolidated financial statements and that could influence the future development of its business.

Economic environment in 2020

As described in the section on the macroeconomic environment in the report on the economic position (see page 52), GEA, as a global technology company, considers global growth in gross domestic product (GDP) and the corresponding forecasts made by the IMF, the World Bank Group and the UN to be indicators in terms of its own performance.

World Economic Outlook IMF (January 2020)	Outlook (percentage change)	
	2020	2019
Worldwide	3.3 %	2.9 %
Advanced economies	1.6 %	1.7 %
Emerging market and developing economies	4.4 %	3.7 %

In the January update of its "World Economic Outlook," the IMF stated that it was expecting global economic growth to improve slightly (by around 3.3 percent) in 2020 after a growth forecast of 2.9 percent for 2019. However, the downward revision of 0.1 percentage point in the forecast for 2020 compared with the last estimate in October was mainly due to disappointing data on economic activity from several emerging and developing countries – chiefly India. Conversely, some threats to global growth have actually diminished compared with the last estimate, including recent progress in the trade negotiations between the USA and China and a decline in the fear of a "no-deal Brexit," for example. According to the IMF, however, the global macroeconomic data do not suggest that a turnaround is in sight. Indeed, significant downside risks continue to make their presence felt, including increasing geopolitical tensions – especially between the U.S. and Iran – and worsening relations between the USA and its trading partners. Should these risks materialize, the mood could rapidly deteriorate and global growth could slump below the projected baseline. Due to the effects of the Covid-19 virus (coronavirus), the IMF cut its 2020 growth forecast for China to 5.6 percent in February 2020, down from 6.0 percent in January of this year. Owing to the virus, the Fund believes that global economic growth will probably be 0.1 of a percentage point down on the 3.3 percent forecast ventured in January.

According to UN estimates, a modest upswing is forecast for 2020 after global growth slipped to its lowest level in a decade a year earlier (World Economic Situation and Prospects, January 2020). Accordingly, the global economy is poised to grow by around 2.5 percent in 2020 (previous year: 2.3 percent) on the back of a slight rebound in the emerging economies. However, the UN's economic experts expect growth in the industrialized nations to be pushed back again to just 1.5 percent. The experts warn that economic risks are still strongly tilted to the downside, with deepening political polarization and increasing skepticism over the benefits of multilateralism merely serving to exacerbate the situation. These risks could inflict severe and long-lasting damage on development prospects. They also threaten to encourage a further rise in inward-looking policies at a time when global cooperation is very important. In exploring the global economic implications of the energy transition, the UN believes that the transition to a cleaner energy mix will bring not only environmental and health benefits, but economic opportunities for many. However, without appropriate political strategies, the costs and benefits will be unevenly distributed within and between countries.

In the most recent issue of its "Global Economic Prospects" publication, the World Bank Group revised its forecasts downwards and is now looking at world growth of just 2.5 percent in 2020 instead of the 2.7 percent previously stated. This means that growth is predicted to be only very slightly above the already weak figure for 2019 (2.4 percent), with trade and investment recovering more slowly than expected. 2020 will therefore remain susceptible to uncertainties and tensions in international trade. The advanced economies are expected to slow again as a group to 1.4 percent (previous year: 1.6 percent), while the emerging markets and developing economies will see growth accelerate to 4.1 percent from 3.5 percent last year.

Economic environment for GEA

Despite the ongoing positive effect of global megatrends, GEA expects demand in its sales markets to stagnate or even slow down slightly during the current 2020 fiscal year as a result of an economic situation that continues to be tense. In addition to the forecasts about trends in the global economy published in January 2020, the company has also included more recent information in its assessment, such as the IMF's adjusted appraisal of the situation released at the end of February. Given the as yet unpredictable consequences of the coronavirus, which is rapidly spreading, these latest forecasts take an increasingly skeptical view of economic performance. The key criterion determining the impact on the global economy will be the time it takes to stabilize and defuse the situation. For example, the Leibniz Center for European Economic Research (ZEW) was surprised following its monthly survey of analysts and institutional investors in mid-February 2020 by a marked decline in economic expectations for Germany as a result of the epidemic. Export-heavy sectors were expected to be among the most affected. Prior to those findings, the forecast had been rising for three months in succession.

The United Nations believe that the world's population, which currently stands at around 7.7 billion (2019 figure), will continue to rise in the coming years, albeit at a slower rate (see World Population Prospects: The 2019 Revision). Since 2007, therefore, the world's population has grown by around 1 billion people – since 1994, by around 2 billion. Expectations are that it will probably rise to between 8.5 and 8.6 billion by 2030, to between 9.4 and 10.1 billion by 2050, and to between 9.4 and 12.7 billion by 2100. With a projected addition of 1.1 billion people, the countries of sub-Saharan Africa could account for more than one half of the growth in the world's population between 2019 and 2050. This means that, in the future, significantly more food will need to be produced on more or less the same cultivation area. For this reason, GEA predicts that today's production processes and methods will need to become much more efficient and that innovative process technology will be required to achieve this objective.

The same study also predicts that stagnating birth rates coupled with higher life expectancies will ensure that virtually all population groups will age over time. Projections indicate that between 2019 and 2050, the number of people around the world aged 65 years or over will more than double, while the number of under-25s will peak and then decline slightly. These demographic trends not only give rise to nutritional challenges, but also challenges with regard to the supply of pharmaceutical products.

At the same time, urbanization continues unabated. Whereas in 1950, only 30 percent of the world's population lived in urban areas, the figure had risen to 55 percent by 2018 (see 2018 Revision of World Urbanization Prospects and The World's Cities in 2018). This share is set to rise to 60 percent in 2030, by which time one third of the world's population will be living in cities with more than 500,000 inhabitants. Whereas in 2000, there were around 370 cities with more than a million inhabitants, this number had increased to 548 by 2018 and will pass the 700 mark by 2030. By 2030, the world is projected to have 43 megacities with more than 10 million inhabitants (up from 33 megacities in 2018). The world's cities are thus increasing in both size and number. The fastest growing cities are to be found in Asia and Africa. In addition, more and more foods must be preserved for longer and be easier to transport in order to secure the necessary supplies for metropolitan areas and to maintain world trade. Here, as well, only state-of-the-art technologies can provide the capacity needed to cope with rising demand.

In addition, the number of people belonging to the global middle class and above is expected to grow. Indeed, in its "Global Wealth Report 2018," Credit Suisse predicts that global wealth is set to continue rising, primarily due to middle-class expansion. Meanwhile, the "World Inequality Report 2018" based on the WID.world database says that although it is highly likely that income inequality will rise and the poorest half of the global population will remain more or less constant, the number of these people will increase in absolute terms due to global population growth. And as the middle class grows, so will the number of people who can afford processed foods, beverages, and dairy products. This is equally true for pharmaceutical products, which must meet the needs of an increasingly health-conscious population.

In light of the medium and long-term trends affecting the global economy and the food industry presented in this section, and the impact of the various megatrends on its direct sales markets, GEA is expecting demand for processed foods to rise and, with that, investment in the food industry to remain stable. Additionally, GEA is anticipating sustained customer interest in process optimization to result in improvements in efficiency, productivity, energy usage, and plant availability – areas in which it believes its technologies can make a valuable contribution. In the short term, however, GEA expects the propensity of its customers to invest to stagnate in 2020 as the global economy is set to grow only minimally compared with 2019.

With regard to commodity prices, the World Bank (see Commodity Markets Outlook, October 2019) expects energy prices to continue falling slightly in 2020 in the wake of an average predicted decrease of some 15 percent in the course of 2019. Prices for the remaining commodities, which fell by around 5 percent in 2019, are expected to remain on or around their current level. According to the World Bank, the worsening macroeconomic environment coupled with a severe slowing of manufacturing output and trade in goods have severely impacted global demand for raw materials recently.

The group's enduring success is based on a number of major global trends, including:

1. Continuous global population growth
2. Growing middle class
3. Increasing demand for high-quality foods and beverages
4. More demand for efficient production methods that also conserve valuable resources.

The proportion of GEA's revenue accounted for by the food industry in 2020 is expected to remain at its current high level. From a regional perspective, too, GEA is not anticipating any significant change in the breakdown of revenue in 2020 as against the past fiscal year.

Growth in the customer industries

Based on its own latest estimates, external reports, and analyses conducted by industry associations, the following trends are expected for GEA's main customer industries:

Dairy Farming

After a slight fall towards the end of 2018, global milk prices recovered in the first half of 2019 as a result of a major decline in milk production. And despite global production then increasing again slightly, growth in 2019 as a whole remained below the long-term average. Global milk prices dropped again somewhat towards the middle of the year, but have been stable at around the level of the last three years for a few months now. Growth in consumption outpaced productive expansion in 2019. With this trend unlikely to change much at the start of 2020, we are predicting a slight recovery in milk prices in the first half of 2020. That said, regulatory, ecological and financial restrictions will deter farmers from a rapid expansion in dairy farming. Although this should, in turn, have a positive effect on milk prices, passing this price trend on to customers might well pose a challenge.

In the mid to long term, GEA still expects that the global milk market will remain on a stable footing. However, regional influences such as poor harvests due to bad weather can always trigger volatility around the globe, especially with regard to milk prices and, therefore, also to the willingness of farmers to make short-term investments.

Dairy Processing

Global demand for dairy products is set to rise further over the next few years, driven largely by the markets of Asia, South America, the Middle East and Africa. This will manifest itself in a corresponding rise in exports, above all to Asia. In general, the consumption of dairy products in North America and Western Europe will remain stable, even if high-value, natural and functional dairy products continue to drive demand in the developed markets. Whey derivatives are a valuable component of new dairy products, and global demand for lactose and other high-value milk components is likely to increase in the future.

Dairies are increasingly concentrating on higher-value products such as yogurt and butter, cheese, baby food and corresponding product innovations in an effort to better offset the volatile milk prices. The continuation of a stronger focus on small and mid-sized investments, especially for innovative production technologies, is therefore to be anticipated.

Food

Global consumption of packaged foodstuffs is set to increase further on the back of growing demand from the emerging economies in the form of larger populations and higher per-capita consumption. In particular baked goods, sauces and dressings, and cooking oils are expected to grow disproportionately strongly. Changing consumer preferences are also driving growth, particularly in the developed markets. Specifically, consumer awareness of healthier foods, the trend towards the latest innovative foods, and growing demand for alternative proteins will require food manufacturers to increase their expenditure on product innovations in order to compete in the market.

Beverages

Global beverage consumption is likely to grow faster over the next few years than in the recent past, driven by increased demand for non-alcoholic beverages. By comparison, demand for alcoholic beverages is set to grow at a slower pace. In regional terms, demand for beverages in the emerging economies is on the increase, while growth in the developed markets remains moderate, all told. Along with an expanding global middle-class population, the key motors of growth are increasing demand for plant-based drinks (e.g., based on soy, oats, almonds or rice) and product innovations that place a greater emphasis on health and functionality, such as sports drinks, non-alcoholic beer and ready-to-drink coffee and tea products.

Pharma

Principally in the developed economies, the expansion of the global middle classes, together with an aging population are set to hike demand for drugs still further. The continuous rise in the number of drugs at various stages of clinical trials will inevitably lead to the emergence of new, patented medicinal products, with so-called biological drugs and drugs for combating rare diseases leading the way. Another factor to be considered in the future is patent expiry, which will lead to an increase in the manufacture of generic products. All told, therefore, we are predicting stable growth in investment outlay in the medium term for the pharmaceuticals segment, with the "pharmerging" markets of China, India, Indonesia, South Korea and Turkey, for example, posting corresponding increases.

Chemical

The rise in the world's population, ongoing urbanization, and the reclassification of rural land are set to fuel demand for, above all, petrochemicals and special-purpose chemicals such as fertilizers. Additional growth can be expected to come from increasing demand for lithium-based products and renewable products such as biodegradable polymers.

A further increase in investments is therefore to be expected, with growth driven less by the major global groups than by regional and mid-sized chemical companies. The Middle East and especially Asia, which now accounts for around half of global chemical sales, will continue to post the strongest growth.

Business outlook

This outlook is based on constant exchange rates and on the assumptions mentioned above, particularly on the forecast that demand in GEA's sales markets is likely to stagnate or even slow down somewhat in 2020 due to continuing tensions afflicting the economy. Potential acquisitions and divestments in 2020 have not been factored into the outlook.

The principal uncertainty in the outlook for 2020 concerns the possible impact on GEA's business activity and performance of the coronavirus, which is spreading rapidly at the present time. As the situation was evolving very quickly as of the preparation of this annual report, it is difficult to predict the consequences, particularly those outside China. For instance, GEA in China is witnessing a noticeable decline in service business due to the severe travel restrictions imposed on service technicians, and this is likely to continue up to the end of the second quarter of 2020. Also, the first cases of illness in Europe lend weight to the assumption that here too, GEA's business can expect further repercussions from the spread of Covid-19. Given these external factors, GEA has decided to issue a more cautious outlook that includes the most likely impacts foreseeable as of the preparation of the report. Due to the potential for delays in production – but also given the possibility of a slump in demand – revenue growth is subdued. Due to this negative revenue development, the group assumes that – despite the initiated restructuring measures – a slight earnings decline can be expected at this time.

A definition of the key financial performance indicators can be found in the section "Control system" (see page 40 ff.).

With regard to the 2020 fiscal year, GEA is expecting:

Outlook* fiscal year 2020	Expectations for 2020	2019
Revenue development	slightly declining	EUR 4,880 million
EBITDA before restructuring measures	EUR 430 – 480 million	EUR 479 million
ROCE	9.0 – 11.0 %	10.6 %

*) For revenue, "slight" indicates a change of up to +/- 5%, while a change of more than +/- 5% is referred to as "significant." For earnings figures, "slight" indicates a change of up to +/- 10%, while a change of more than +/- 10% is deemed "significant." GEA defines changes in ROCE of up to +/- 3%p as "slight" and changes in excess of +/- 3 %p as "significant."

GEA is expecting the following trends to materialize for the individual divisions compared with the group as a whole:

Revenue development* (EUR million)	Expectations for 2020	(pro-forma) 2019
Separation & Flow Technologies	slightly declining	1,238
Liquid & Powder Technologies	slightly declining	1,729
Food & Healthcare Technologies	slightly declining	963
Refrigeration Technologies	slightly declining	705
Farm Technologies	slightly declining	656
Consolidation	–	–411

*) For revenue, "slight" indicates a change of up to +/- 5%, while a change of more than +/- 5% is referred to as "significant."

EBITDA before restructuring measures* (EUR million)	Expectations for 2020	(pro-forma) 2019
Separation & Flow Technologies	slightly declining	247.1
Liquid & Powder Technologies	significantly rising	87.2
Food & Healthcare Technologies	slightly declining	66.8
Refrigeration Technologies	slightly declining	58.3
Farm Technologies	slightly declining	60.3
Others	significantly declining	–39.0
Consolidation	–	–1.5

*) For earnings figures, "slight" indicates a change of up to +/- 10%, while a change of more than +/- 10% is deemed "significant.

ROCE* (in %)	Expectations for 2020	(pro-forma) 2019
Separation & Flow Technologies	slightly declining	20.5
Liquid & Powder Technologies	significantly rising	14.4
Food & Healthcare Technologies	slightly rising	2.1
Refrigeration Technologies	slightly declining	13.4
Farm Technologies	slightly declining	10.2

*) GEA defines changes in ROCE of up to +/- 3%p as "slight" and changes in excess of +/- 3 %p as "significant." For capital employed, the 2019 pro-forma figures reflect the same allocation of proportionate goodwill as had resulted from the reallocation for FY 2020 pursuant to IAS 36.87. No ROCE is determined for the "Other" segment.

Further expectations

Portfolio

In 2020, GEA is looking to forge ahead with various divestment initiatives. Chief among these are transactions initiated in 2019 either as part of portfolio measures aimed at improving margins, or by restructuring programs. The strategy of acquiring companies that enable GEA to strengthen its focus on the areas of food, beverages and pharmaceuticals still fundamentally applies.

Dividend

The Executive Board and Supervisory Board will propose to the Annual General Meeting an unchanged dividend of EUR 0.85 per share for 2019. This means that the total dividend payout will again amount to some EUR 153.4 million based on the number of dividend-bearing shares in circulation as of March 12, 2020.

Medium-term financial targets to 2022

In autumn 2019, GEA presented new, medium-term financial targets for the period up to the end of fiscal year 2022, according to which consolidated revenues are expected to grow by 2-3 percent a year on average. The EBITDA margin before restructuring expenses, which was 9.8 percent in 2019, is projected to increase to a target range of 11.5-13.5 percent. Furthermore, GEA plans to elevate capex to a target corridor of 2.5-3.5 percent of revenue between the years 2020 and 2022. Most of the augmented capital expenditure will be channeled into improving the production network and implementing a standardized ERP system. The objective is to reduce net working capital intensity to between 12.0 and 14.0 percent by 2022.

Summary

All told, with the investment appetite of customers expected to stagnate or fall slightly, GEA is anticipating consolidated revenue to drop slightly in 2020. Due to this negative revenue development, the group assumes that – despite the initiated restructuring measures – a slight decline in EBITDA before restructuring measures can be expected at this time. Accordingly, return on capital is expected to be in the range of 9.0 to 11.0 percent. Despite the current challenges posed by the coronavirus, the company remains very confident about future growth prospects based on the optimization measures initiated and the still attractive end markets. With regard to the distribution ratio, our objective is still to distribute between 40 and 50 percent of net income to our shareholders.

Düsseldorf, March 12, 2020

Stefan Klebert | Johannes Giloth | Marcus A. Ketter

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Consolidated Balance Sheet

as of December 31, 2019

Assets (EUR thousand)	Section	12/31/2019	12/31/2018
Property, plant and equipment	5.1	718,524	518,706
Investment property	5.2	2,201	2,354
Goodwill	5.3	1,512,181	1,755,290
Other intangible assets	5.4	429,322	482,672
Equity-accounted investments	5.5	5,672	11,883
Other non-current financial assets	5.6	47,185	38,283
Deferred taxes	7.7	351,555	306,082
Non-current assets		**3,066,640**	**3,115,270**
Inventories	5.7	741,200	741,344
Contract assets	5.8	413,038	462,787
Trade receivables	5.9	915,078	923,884
Income tax receivables	5.10	32,779	40,214
Other current financial assets	5.6	187,123	183,968
Cash and cash equivalents	5.11	354,559	247,900
Assets held for sale	5.12	158	3,700
Current assets		**2,643,935**	**2,603,797**
Total assets		**5,710,575**	**5,719,067**

Equity and liabilities (EUR thousand)	Section	12/31/2019	12/31/2018
Subscribed capital		520,376	520,376
Capital reserve		1,217,861	1,217,861
Retained earnings		265,176	647,950
Accumulated other comprehensive income		86,260	62,681
Equity attributable to shareholders of GEA Group AG		**2,089,673**	**2,448,868**
Non-controlling interests		421	568
Equity	6.1	**2,090,094**	**2,449,436**
Non-current provisions	6.2	124,656	157,235
Non-current employee benefit obligations	6.3	866,200	791,262
Non-current financial liabilities	6.4	423,975	305,246
Non-current contract liabilities	6.6	272	364
Other non-current liabilities	6.8	21,438	23,744
Deferred taxes	7.7	104,282	103,008
Non-current liabilities		**1,540,823**	**1,380,859**
Current provisions	6.2	177,884	160,770
Current employee benefit obligations	6.3	235,214	164,245
Current financial liabilities	6.4	90,040	28,472
Trade payables	6.5	741,956	723,334
Current contract liabilities	6.6	639,435	622,948
Income tax liabilities	6.7	34,005	31,152
Other current liabilities	6.8	161,124	157,851
Current liabilities		**2,079,658**	**1,888,772**
Total equity and liabilities		**5,710,575**	**5,719,067**

Consolidated Income Statement

for the period January 1 – December 31, 2019

(EUR thousand)	Section	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
Revenue	7.1	4,879,702	4,828,210
Cost of sales		3,478,497	3,421,713
Gross profit		**1,401,205**	**1,406,497**
Selling expenses		615,324	556,636
Research and development expenses		90,733	79,914
General and administrative expenses		516,036	497,641
Other income	7.2	338,829	336,395
Other expenses	7.3	608,747	332,742
Net result from impairment and reversal of impairment on trade receivables and contract assets		–17,813	–17,235
Share of profit or loss of equity-accounted investments		695	1,744
Other financial income	7.5	1,950	1,860
Other financial expenses	7.6	3,111	2,547
Earnings before interest and tax (EBIT)		**–109,085**	**259,781**
Interest income	7.5	15,333	4,658
Interest expense	7.6	31,770	33,747
Profit before tax from continuing operations		**–125,522**	**230,692**
Income taxes	7.7	61,032	115,541
thereof current taxes		82,332	64,203
thereof deferred taxes		–21,300	51,338
Profit after tax from continuing operations		**–186,554**	**115,151**
Profit or loss after tax from discontinued operations	7.8	**15,883**	**–1,618**
Profit for the period		**–170,671**	**113,533**
thereof attributable to shareholders of GEA Group AG		–170,575	113,435
thereof attributable to non-controlling interests		–96	98

(EUR)	Section	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
Basic and diluted earnings per share from continuing operations		–1.03	0.64
Basic and diluted earnings per share from discontinued operations		0.09	–0.01
Basic and diluted earnings per share	7.9	**–0.95**	**0.63**
Weighted average number of ordinary shares used to calculate basic and diluted earnings per share (million)		**180.5**	**180.5**

Consolidated Statement of Comprehensive Income

for the period January 1 – December 31, 2019

(EUR thousand)	Section	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
Profit for the period		**–170,671**	**113,533**
Items, that will not be reclassified to profit or loss in the future:			
Actuarial gains/losses on pension and other post-employment benefit obligations	6.3.1	–58,523	–13,045
thereof changes in actuarial gains and losses		–83,547	–17,001
thereof tax effect		25,024	3,956
Items, that were reclassified to profit or loss or will be reclassified subsequently			
Exchange differences on translating foreign operations		23,579	23,932
thereof changes in unrealized gains and losses		23,305	23,932
thereof realized gains and losses		274	–
Result from fair value measurement of financial instruments		687	–977
thereof changes in unrealized gains and losses	6.9	982	–1,396
thereof tax effect		–295	419
Reclassification in profit or loss from fair value measurement of financial instruments		–687	977
thereof net result from impairment and reversal of impairment on financial assets		–982	1,396
thereof tax effect		295	–419
Other comprehensive income		–34,944	10,887
Total comprehensive income		**–205,615**	**124,420**
thereof attributable to GEA Group AG shareholders		–205,519	124,322
thereof attributable to non-controlling interests		–96	98

Consolidated Cash Flow Statement

for the period January 1 – December 31, 2019

(EUR thousand)	Section	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
Profit for the period		–170,671	113,533
plus income taxes		61,032	115,541
minus profit or loss after tax from discontinued operations		–15,883	1,618
Profit before tax from continuing operations		–125,522	230,692
Net interest income		16,437	29,089
Earnings before interest and tax (EBIT)		**–109,085**	**259,781**
Depreciation, amortization, impairment losses, and reversal of impairment losses on non-current assets		483,458	171,416
Other non-cash income and expenses		30,070	28,277
Employee benefit obligations from defined benefit pension plans		–40,740	–41,472
Change in provisions and other employee benefit obligations		119,163	1,320
Losses and disposal of non-current assets		–3,542	–4,010
Change in inventories including unbilled construction contracts*		30,787	–79,463
Change in trade receivables		19,537	–9,148
Change in trade payables		8,730	65
Change in other operating assets and liabilities		14,222	12,866
Tax payments		–69,371	–71,643
Cash flow from operating activities of continued operations		**483,229**	**267,989**
Cash flow from operating activities of discontinued operations		–5,230	–5,333
Cash flow from operating activities		**477,999**	**262,656**
Proceeds from disposal of non-current assets		8,163	9,575
Payments to acquire property, plant and equipment, and intangible assets		–136,962	–132,067
Payments from non-current financial assets		–4,471	–271
Interest income		1,967	2,958
Dividend income		2,931	6,020
Payments to acquire subsidiaries and other businesses		–	–17,401
Payments from sale of subsidiaries and other businesses	4.2	–12,630	–15,165
Cash flow from investing activities of continued operations		**–141,002**	**–146,351**

(EUR thousand)	Section	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
Cash flow from investing activities of discontinued operations		–6,600	–536
Cash flow from investing activities		**–147,602**	**–146,887**
Dividend payments		–153,418	–153,418
Payments for acquisition of treasury shares		–	–24,022
Payments from lease liabilities (Prior year: Payments from finance leases)		–63,483	–4,277
Proceeds from finance loans		258,978	319,126
Proceeds from bond issue		–	249,500
Repayments of finance loans		–253,100	–492,015
Interest payments		–15,015	–7,775
Cash flow from financing activities of continued operations		**–226,038**	**–112,881**
Cash flow from financing activities of discontinued operations		–66	–109
Cash flow from financing activities		**–226,104**	**–112,990**
Effect of exchange rate changes on cash and cash equivalents		2,411	–4,797
Change in unrestricted cash and cash equivalents		**106,704**	**–2,018**
Unrestricted cash and cash equivalents at beginning of period		247,475	249,493
Unrestricted cash and cash equivalents at end of period	5.11	354,179	247,475
Restricted cash and cash equivalents	5.11	380	425
Cash and cash equivalents total		**354,559**	**247,900**

*) Including advanced payments received.

Consolidated Statement of Changes in Equity

as of December 31, 2019

(EUR thousand)	Subscribed capital[1]	Capital reserves	Retained earnings	Accumulated other comprehensive income: Translation of foreign operations	Accumulated other comprehensive income: Result from fair value measurement of financial instruments	Accumulated other comprehensive income: Result of cash flow hedges	**Equity attributable to shareholders of GEA Group AG**	Non-controlling interests	**Total**
Balance at Jan. 1, 2018 (181,026,744 shares)	**489,372**	**1,217,861**	**752,615**	**38,749**	**–**	**–**	**2,498,597**	**1,191**	**2,499,788**
Profit for the period	–	–	113,435	–	–	–	**113,435**	98	**113,533**
Other comprehensive income	–	–	–13,045	23,932	–	–	**10,887**	–	**10,887**
Total comprehensive income	–	–	100,390	23,932	–	–	**124,322**	98	**124,420**
Purchase of treasury shares	–1,445	–	–19,508	–	–	–	**–20,953**	–	**–20,953**
Redemption of shares	32,449	–	–32,449	–	–	–	**–**	–	**–**
Dividend payment by GEA Group Aktiengesellschaft	–	–	–153,418	–	–	–	**–153,418**	–	**–153,418**
Adjustment Hyperinflation[2]	–	–	320	–	–	–	**320**	–	**320**
Changes in combined Group	–	–	–	–	–	–	**–**	–	**–**
Change in non-controlling interests	–	–	–	–	–	–	**–**	–721	**–721**
Balance at Dec. 31, 2018 (180,492,172 shares)	**520,376**	**1,217,861**	**647,950**	**62,681**	**–**	**–**	**2,448,868**	**568**	**2,449,436**
Profit for the period	–	–	–170,575	–	–	–	**–170,575**	–96	**–170,671**
Other comprehensive income	–	–	–58,523	23,579	–	–	**–34,944**	–	**–34,944**
Total comprehensive income	–	–	–229,098	23,579	–	–	**–205,519**	–96	**–205,615**
Purchase of treasury shares	–	–	–	–	–	–	**–**	–	**–**
Redemption of shares	–	–	–	–	–	–	**–**	–	**–**
Dividend payment by GEA Group Aktiengesellschaft	–	–	–153,418	–	–	–	**–153,418**	–	**–153,418**
Adjustment Hyperinflation[2]	–	–	1,890	–	–	–	**1,890**	–	**1,890**
Changes in combined Group	–	–	–2,148	–	–	–	**–2,148**	–	**–2,148**
Change in non-controlling interests	–	–	–	–	–	–	**–**	–51	**–51**
Balance at Dec. 31, 2019 (180,492,172 shares)	**520,376**	**1,217,861**	**265,176**	**86,260**	**–**	**–**	**2,089,673**	**421**	**2,090,094**

1) As of 01/01/2018 issued capital
2) Effect of accounting for Hyperinflation in Argentina according to IAS 29

Notes to the Consolidated Financial Statements

1. Reporting Principles

1.1 Basis of presentation

The accompanying consolidated financial statements include GEA Group Aktiengesellschaft, Peter-Müller-Strasse 12, 40468 Düsseldorf/Germany (entry HRB 65691 in the commercial register of the Local Court of Düsseldorf) and its subsidiaries, which together make up the GEA Group ("GEA" in short). GEA Group Aktiengesellschaft is a listed corporation. The consolidated financial statements were prepared in accordance with the International Financial Reporting Standards (IFRSs) and related Interpretations issued by the International Accounting Standards Board (IASB), as adopted by the EU in compliance with Regulation (EC) No. 1606/2002 of the European Parliament and the Council on the application of international accounting standards. The disclosures pertaining to Section 315e of the HGB are contained in the Notes to the Consolidated Financial Statements.

The accompanying consolidated financial statements have been prepared in euros (EUR). Unless otherwise stated, all amounts, including the prior-year figures, are presented in thousands of euros (EUR thousand). All amounts have been rounded using standard rounding rules. Adding together individual amounts may therefore result in differences in the order of EUR 1 thousand in certain cases.

To improve the clarity of presentation, various items in the consolidated balance sheet and income statement have been aggregated and are explained accordingly in the notes. Assets and liabilities are classified into current and non-current items. The income statement is prepared using the cost of sales method.

The cash flow statement is prepared using the indirect method for cash flow from operating activities and the direct method for cash flow from investing and financing activities.

The Executive Board of GEA Group Aktiengesellschaft prepared these consolidated financial statements on March 12, 2020, and released them for publication.

1.2 Accounting pronouncements applied for the first time

The accounting standards presented below were applied by GEA for the first time in the year under review:

IFRS 16 "Leases" – issued by the IASB in January 2016

On January 1, 2019, GEA applied the new IFRS 16 standard on lease accounting for the first time. The new standard introduced a single lessee accounting model in which most leases and the associated contractual rights and obligations are recorded on the balance sheet. This has eliminated the classification of leases as either operating leases or finance leases for a lessee, as so far required under IAS 17.

For lessors, on the other hand, the regulations of the new standard resemble those of the previous standard IAS 17. Leases continue to be classified either as finance or operating leases. The IAS 17 criteria have been adopted by IFRS 16 for classification purposes.

In addition, IFRS 16 contains a series of additional regulations regarding reporting and disclosures in the notes, as well as sale and leaseback transactions.

IFRS 16 replaces the current rules of IAS 17 "Leases" and the associated interpretations in IFRIC 4 "Determining whether an Arrangement contains a Lease", SIC 15 "Operating Leases – Incentives," and SIC 27 "Evaluating the Substance of Transactions Involving the Legal Form of a Lease."

Transition method, practical expedients, and exercising of options

As GEA is applying IFRS 16 under the "modified retrospective" method, GEA has elected not to restate its prior-period figures. Rather than reassessing current leases, GEA is applying IFRS 16 as of the transition date only to contracts previously identified as leases under IAS 17 or IFRIC 4. For leases previously classified as operating leases GEA as a lessee has measured the corresponding right-of-use assets at the time of initial application as being equal to the amount of the lease liabilities, with no effect on equity. Material leasing agreements exist primarily in the areas of real estate and vehicles. The exemption which allows for leasing agreements with a residual term of under 12 months to be classified as short-term leases as of the time of initial application will not be used. With regard to leasing arrangements previously treated as finance leases, GEA, as the lessee, has rolled over the carrying amounts as of the transition date. GEA is disclosing right-of-use assets to property, plant, and equipment in the same balance sheet item as the underlying assets, as if they were own property. Right-of-use assets defined as investment property are recognized under that item. GEA is disclosing lease liabilities as part of its financial liabilities.

For every lease agreement, GEA, as the lessee, must recognize a liability equal to the present value of the future lease payments, as well as a right-of-use asset capitalized at the present value of future lease payments, plus directly attributable costs. The lease payments include fixed payments, variable payments that depend on an index or rate, expected payments based on residual value guarantees, and, where applicable, the exercise price of purchase options and penalties for the premature termination of leasing agreements. Essentially, GEA as lessee is using the incremental borrowing rate for discounting future lease payments, the weighted average interest rate being 2.8% as of January 1, 2019. During the term of the lease, the lease liability is measured using the effective interest method. However, the right-of-use asset is depreciated over the term of the leasing agreement (scheduled depreciation). GEA applies the relevant recognition exemption to leased assets of low value and to short-term leases (agreements of 12 months and less), which means that lease expenses will continue to be recognized for such arrangements. Rather than separating leasing from non-leasing components, GEA is accounting for each leasing component and all its associated non-leasing components as a single leasing component.

Effect of initial application

Due to the initial application of IFRS 16, GEA recognized right-to-use assets arising from leases of EUR 177,215 thousand (plus an equal volume of lease liabilities) as of January 1, 2019. In the following, the operating rental and lease obligations as per December 31, 2018 are reconciled with the lease liabilities recognized for the first time on January 1, 2019.

(EUR thousand)	01/01/2019
Rental and lease obligations as of 12/31/2018	188,251
Liabilities from finance leases as of 12/31/2018	6,934
Renewal options reasonably certain to be exercised	14,090
Recognition exemption for short term leases	–3,953
Recognition exemption for leases of low value assets	–1,464
Lease obligation for assets not yet available for use as of 01/01/2019	–8,044
Other	460
Gross lease liabilities as of 01/01/2019	**196,274**
Discounting	–12,664
Total lease liabilities as of 01/01/2019	**183,610**
Present value of finance lease liabilities as of 12/31/2018	–6,395
Additional lease liability from initial application of IFRS 16 as of 01/01/2019	**177,215**

IFRIC 23 “Uncertainty over Income Tax Treatments” – issued by the IASB in June 2017

How certain circumstances and transactions are ultimately treated for tax can depend on whether the relevant financial authority accepts the treatments an entity has used or plans to use in its income tax filing. IFRIC 23 supplements the provisions set out in IAS 12 “Income Taxes” by clarifying the accounting for uncertainties in income taxes with regard to certain circumstances and transactions.

The initial application of IFRIC 23 had no material effect on the consolidated financial statements.

Amendments to IFRS 9 “Financial Instruments:” Prepayment Features with Negative Compensation – issued by the IASB in October 2017

The IASB has published amendments to IFRS 9 in order to address concerns about how IFRS 9 classifies particular prepayable financial assets.

The existing IFRS 9 provisions on termination rights will be modified to allow such financial assets to be measured at amortized cost (or, depending on the business model, at fair value through other comprehensive income) even in the case of negative compensation.

The amendment also serves to clarify an aspect of accounting for financial liabilities: in cases where a financial liability is restructured but not derecognized, its carrying amount must be adjusted immediately through profit and loss. Therefore, accounts may need to be amended retroactively if, in the past, the effective interest rate – rather than the amortized costs – was adjusted subsequent to a modification.

The initial application had no significant effect on the consolidated financial statements.

Amendments to IAS 28 “Investments in Associates and Joint Ventures”– Long-term Interests in Associates and Joint Ventures – issued by the IASB in October 2017

The amendment to IAS 28 clarifies an issue whereby IFRS 9 is applied to long-term interests in associates and joint ventures that form part of the net investment in that associate or joint venture, but are not equity-accounted.

The initial application of the amendments to IAS 28 had no material effect on the consolidated financial statements.

Improvements to IFRSs 2015-2017 Cycle – amendments under the IASB's annual improvements project – issued by the IASB in December 2017

The improvements result from the IASB's annual improvements process, which is designed to make minor amendments to standards and interpretations. They comprise minor amendments to four standards in all (IFRS 3, IFRS 11, IAS 12 and IAS 23).

The initial application of the new requirements had no material effect on the consolidated financial statements.

Amendments to IAS 19 "Employee Benefits" – Plan Amendment, Curtailment or Settlement – issued by the IASB in February 2018

The amendments concern the regulations governing amendments, curtailments and settlements of plans. According to IAS 19, if a plan amendment, curtailment or settlement occurs, it is now mandatory that the net liability arising from defined benefit pension plans be remeasured using the latest actuarial assumptions. The amendments further clarify that in such an event, it is mandatory that the current service cost and the net interest for the period after remeasurement are also determined using the latest assumptions used for the remeasurement.

The initial application had no significant effect on the consolidated financial statements.

1.3 Accounting pronouncements not yet applied

The accounting standards and interpretations, as well as amendments to existing standards and interpretations presented below, were issued but not yet required to be applied to the preparation of the IFRS consolidated financial statements as of December 31, 2019.

Unless otherwise stated, the new standards and interpretations have been endorsed by the EU. GEA will not be applying the new standards and interpretations prematurely.

GEA is currently examining the consequences of the revised accounting standards on the consolidated financial statements and will determine the date of initial application.

Amendments to IFRS 10 and IAS 28 – Sale or Contribution of Assets between an Investor and its Associate or Joint Venture – issued by the IASB in September 2014

The amendments address a known inconsistency between the requirements of IFRS 10 and those of IAS 28 (2011) in cases where assets are sold to or contributed by an associate or a joint venture. In the future, the gain or loss resulting from such a transaction will only be recognized in full if the asset sold or contributed is a business within the meaning of IFRS 3, regardless of whether the transaction is structured as a share deal or an asset deal. However, if the assets do not constitute a business, any gain or loss is recognized only in proportion to the investor's interest in the associate or joint venture.

GEA does not expect the implementation of the amendments to IFRS 10 and IAS 28 to materially affect its financial reporting.

In December 2015, the IASB issued an amendment to IFRS 15 deferring the timing of initial application. The reason for the postponement is that the IASB wants to take another look at certain transactions in the context of a research project on the equity method of accounting. Notwithstanding this deferral, early application of the amendments will be permitted once they have been endorsed by the EU, which is still outstanding.

Amendments to references to the conceptual framework in IFRS standards – issued by the IASB in March 2018

The IASB has published its revised conceptual framework for financial reporting together with supporting material. The aim of the conceptual framework is to assist the IASB in developing standards, to help preparers develop consistent accounting policies, and to assist all parties in their understanding and interpretation of IFRS.

The revised conceptual framework now contains eight full chapters, with new sections on measurement, presentation and disclosure, and recognition and derecognition. In addition, the sections on defining terms such as "asset" and "liability" and reporting assets and liabilities in financial statements have also been revised. The terms "prudence," "management responsibility," "measurement uncertainty" and "economic perspective" were also redefined in the interest of clarity.

GEA does not expect the initial application of the revised conceptual framework to materially affect its financial reporting.

The revised conceptual framework is effective for preparers in annual periods beginning on or after January 1, 2020. Insofar as all updated cross-references are applied simultaneously, earlier adoption is permitted.

Amendments to IFRS 3 "Business Combinations" – issued by the IASB in October 2018

The amendments to IFRS 3 concern the definition of a business and address the difficulties that arise when an entity determines whether it has acquired a business or a group of assets. Essentially, the amendments state that to be considered a business, an acquired set of activities and assets must include, at a minimum, an input and a substantive process that together significantly contribute to the ability to create results (outputs). The amendments also narrow the definitions of a business and of outputs by focusing on goods and services provided to customers and by removing the reference to an ability to reduce costs. The condition of assessing whether market participants are capable of replacing any missing inputs or processes and continuing to produce outputs has been removed. Finally, an optional concentration test has been added that permits a simplified assessment of whether an acquired set of activities and assets is not a business.

GEA does not expect the implementation of the amendments to IFRS 3 to materially affect its financial reporting.

Subject to endorsement by the EU, the amendments are effective for business combinations for which the acquisition date is on or after the beginning of the first annual reporting period beginning on or after 1 January 2020, as well as for acquisitions of groups of assets taking place on or after the start of this period. Earlier application is permitted.

Amendments to IAS 1 "Presentation of Financial Statements" and to IAS 8 "Accounting Policies, Changes in Accounting Estimates and Errors" concerning the definition of materiality – issued by the IASB in October 2018

The changes aim to narrow the definition of "material" and to align the definition used in the conceptual framework and the standards themselves, while making it easier for preparers to assess materiality without the existing regulations being changed to a substantial degree.

The existing definition focuses on the criteria by which omissions or misstatements are deemed "material," whereas the revised definition refers to the materiality of items of information. A shift of emphasis has therefore taken place. The amendments aim to assert that obscuring material information with information that can be omitted can have a similar effect as omitting or misstating the original information, the term "obscuring" being a novel element in the definition of materiality. It was also emphasized that information must be regarded as material if it "could reasonably be expected to influence the decisions of users." Also, the existing definition of "users" was narrowed to "primary users" of the information disclosed in financial statements.

GEA does not expect the implementation of the amendments to IAS 1 and IAS 8 to materially affect its financial reporting.

The changes are applicable to financial years beginning on or after January 1, 2020. Earlier application is permitted.

Interest Rate Benchmark Reform (amendments to IFRS 9, IAS 39 and IFRS 7) – issued by the IASB in September 2019

The expedients provided by the amendments allow companies to continue using hedge accounting during the period of uncertainty that exists prior to the replacement of an existing benchmark, e.g., an IBOR or "Interbank Offered Rate." A company must apply the regulations to all hedging relationships affected by reform of the reference interest rate, and make additional disclosures with regard to these relationships in the notes.

GEA does not expect the amendments to IFRS 9, IAS 39 and IFRS 7 to affect its financial reporting.

The changes are applicable to financial years beginning on or after January 1, 2020. Earlier application of the amendments is permitted.

Amendments to IAS 1 "Presentation of Financial Statements" – issued by the IASB in January 2020

The amendments to IAS 1 serve to clarify the criteria by which a liability is classified as either current or non-current. The amendments assert that a liability should be classified as non-current if an entity has substantial rights, in place at the reporting date, to defer settlement of the liability for at least twelve months after the reporting period. If the exercising of these rights is subject to certain conditions being met, the entity must have done so by the reporting date; otherwise the liability is to be classified as current.

GEA does not expect the implementation of the amendments to IFRS 1 to materially affect its financial reporting.

Subject to endorsement by the EU, these new regulations are to be applied for fiscal years beginning on or after January 1, 2022. Earlier application is permitted.

2. Accounting Policies

2.1 Description of accounting policies

Basis of consolidation

GEA's consolidated financial statements include all significant companies that GEA Group Aktiengesellschaft directly or indirectly holds the majority of voting rights or otherwise directly or indirectly controls by holding, for example based on contractual arrangements. Control exists when GEA is exposed, or has rights, to variable returns from involvement with the investee on the one hand, and has the ability to affect those returns through its power over the investee on the other. Subsidiaries are consolidated from the date on which the group obtains control over them. They are deconsolidated from the date on which control is lost.

Acquired subsidiaries are accounted for using the purchase method. The consideration paid is measured on the basis of the fair value of the assets received, the liabilities assumed to the seller, and the equity instruments issued at the transaction date. The identifiable assets acquired and liabilities and contingent liabilities assumed in the business combination are recognized at their fair value at the transaction date, irrespective of any non-controlling interests. Any contingent consideration agreed is recognized at fair value at the acquisition date. Subsequent changes in fair value are recognized in profit or loss.

The excess of cost over the share of the fair value of the subsidiary's net assets acquired is recognized as goodwill. If, after a further examination, cost is lower than the share of the fair value of the subsidiary's acquired net assets measured at fair value, the difference is recognized as a gain in profit or loss.

Investments in subsidiaries, intragroup receivables, liabilities, and income and expenses are eliminated, as are profits and losses from intragroup transactions.

If consolidated subsidiaries have a different reporting date to the parent, they are included on the basis of interim financial statements as of December 31, 2019.

The consolidated group changed as follows in fiscal year 2019:

Number of companies	2019	2018
Consolidated group as of January 1	**206**	**215**
German companies (including GEA Group AG)	29	32
Foreign companies	177	183
Initial consolidation*	1	4
Merger	–2	–10
Liquidation	–3	–1
Sale	–3	–1
Deconsolidation	–2	–1
Consolidated group as of December 31	**197**	**206**
German companies (including GEA Group AG)	29	29
Foreign companies	168	177

*) Refers to the initial consolidation of GEA Farm Technologies Tarim Ekip.Mak.Kim. Tek.Dan.San.Tic.Ltd.Sti.

A total of 44 subsidiaries (previous year: 50) were not consolidated since their effect on the group's net assets, financial position, and results of operations is not material even when viewed in the aggregate. Their consolidated revenue amounts to 0.1 percent (previous year: 0.1 percent) of the group's aggregate consolidated revenue, while their earnings account for –1.0 percent (previous year: 0.4 percent) of recognized earnings before tax of the complete group, and their equity accounts for 1.1 percent (previous year: 0.6 percent) of consolidated equity. The subsidiaries are measured at cost and recognized as other non-current financial assets, as their fair value cannot be determined with sufficient certainty.

A complete list of all subsidiaries, associates, and joint ventures can be found in section 12.4.

Changes in ownership interest

Changes in GEA's ownership interest in a subsidiary that do not result in obtaining or losing control are equity transactions. The carrying amounts of controlling and noncontrolling interests must be adjusted in such way that they reflect the changes in ownership interests in the subsidiaries. Any difference between the amount by which the noncontrolling interests are adjusted and the fair value of the consideration paid or received must be recognized directly in equity, and attributed to the owners of GEA.

Investments in associates and joint ventures

Entities over which a group company can exercise significant influence, i.e. it can participate in the investee's financial and operating policy decisions, are accounted for as associates. This generally relates to companies in which GEA directly or indirectly holds 20 to 50 percent of the voting rights.

Joint ventures are joint arrangements whereby the parties involved have joint control over the arrangement and rights to its net assets. Joint control exists when decisions about the relevant activities of the joint arrangement require the unanimous consent of GEA and the other parties that collectively control the arrangement.

Associates and joint ventures are accounted for using the equity method at the group's share of adjusted equity. They are initially recognized at cost. Any goodwill arising on acquisition is included in the carrying amount of the investment.

The group's share of the profit or loss of equity-accounted investments is recognized in the income statement (as part of EBIT) and presented separately. The group's share of income and expenses recognized outside profit or loss is reported directly in other comprehensive income. If the group's share of an associate's or joint venture's loss exceeds the carrying amount of the net investment in the associate or joint venture, no further losses are recognized.

Where necessary, the accounting policies of associates and joint ventures are adjusted to comply with uniform group accounting principles.

As of the reporting date, one investment in associates (previous year: 1) and four investments in joint ventures (previous year: 5) were accounted for using the equity method.

Joint operations

Joint operations are joint arrangements whereby the parties involved have joint control over the arrangement and rights to the assets, and obligations for the liabilities, relating to the arrangement. Joint control exists when decisions about the relevant activities of the joint arrangement require the unanimous consent of GEA and the other parties that collectively control the arrangement.

The assets, liabilities, income, and expenses of joint operations are accounted for in proportion to GEA's interest in them in accordance with the relevant IFRSs. As of December 31, 2019, there were no joint operations in the consolidated financial statements.

Currency translation

The group companies prepare their annual financial statements on the basis of their respective functional currencies.

Foreign currency transactions entered into by companies included in the consolidated financial statements are translated into the functional currency at the exchange rate prevailing at the transaction date. Monetary assets and liabilities are translated at the applicable exchange rate at each reporting date. The exchange rate gains and losses resulting from these items are generally reported in the income statement under other income or expenses.

All financial statements of companies whose functional currencies differ from the reporting currency are translated into the reporting currency used in GEA's consolidated financial statements. The assets and liabilities of the companies included in the consolidated financial statements are translated at the middle rates prevailing at the reporting date. The income statements are translated at the middle rates prevailing at the reporting date. The income statements of these companies are translated at the average rates for the period under review. If these average rates are not a reasonable approximation of the actual transaction rates, the income statements are translated at the relevant transaction rates. In the case of countries with high levels of inflation, currencies are always translated at the closing rate. Any translation differences are reported in equity under other comprehensive income and adjusted.

Goodwill from the acquisition of foreign subsidiaries is translated at the closing rate as an asset attributable to these companies.

Property, plant and equipment

Items of property, plant and equipment are carried at cost less cumulative depreciation and impairment losses, plus reversals of impairment losses.

Expenses for major regular maintenance are amortized over the remaining useful life of the asset concerned or over the period to the next maintenance date.

The carrying amount of items of property, plant and equipment is reviewed if it is likely to have been impaired by events or changes in circumstances. An impairment test is performed by comparing the asset's carrying amount with its recoverable amount. The recoverable amount is defined as the higher of internal value in use and fair value less costs of disposal (net realizable value). Fair value is primarily determined on the basis of the current local market price for used machinery or commercial real estate. If the carrying amount exceeds the recoverable amount, an impairment loss is recognized. To assess impairment, assets are grouped at the lowest level for which separate cash flows can be identified. If the reason for the impairment subsequently ceases to apply, the impairment loss is reversed up to a maximum of historical cost, net of accumulated depreciation.

Leases

Financial year beginning January 1, 2019

GEA assesses at contract inception whether a contract is, or contains, a lease. That is, if the contract conveys the right to control the use of an identified asset for a period of time in exchange for consideration.

As lessee, GEA must recognize the cost of the right-of-use asset equal to the present value of the future lease payments plus directly attributable costs. The right-of-use asset is depreciated over the lease term (scheduled depreciation) and adjusted, where necessary, for impairment losses and any remeasurement of lease liabilities. If ownership passes to GEA at the end of the lease term, e.g., because the company has exercised a purchase option, the underlying asset is subject to scheduled depreciation over its useful life.

At the commencement date, a liability equal to the present value of future lease payments must be recognized for each lease agreement. The lease payments include fixed payments, variable payments that depend on an index or rate, expected payments under residual value guarantees, and, where applicable, the exercise price of purchase options and penalties for the premature termination of lease agreements. Rather than separating leasing from non-leasing components, GEA is accounting for each leasing component and all its associated non-leasing components as a single leasing component.

Essentially, as the lessee, GEA uses the incremental borrowing rate for discounting future lease payments, since the rate implicit in the lease cannot easily be determined. During the term of the lease, the lease liability is measured using the effective interest method. The liability is reduced correspondingly by the lease payments made.

The lease liabilities are remeasured if there is a change in the assessment of purchase, renewal or termination options, or if adjustments to lease payments are made.

GEA intends to apply the relevant recognition exception to leased assets of low value and to short-term leases (agreements of 12 months and less), which means that lease expenses will be recognized for such arrangements. GEA has decided against voluntarily applying IFRS 16 to its intangible assets.

GEA is disclosing right-of-use assets to property, plant, and equipment in the same balance sheet item as the underlying assets, as if they were own property. Right-of-use assets defined as investment property are recognized under that item. GEA is disclosing lease liabilities as part of its financial liabilities.

Where GEA is the lessor, leases are classified either as finance or operating leases. Leases which essentially transfer all risks and rewards associated with ownership of the asset are classified as finance leases, while all other leasing transactions where GEA is the lessor are treated as operating leases. The remaining accounting policies have not changed with the introduction of IFRS 16 compared with the method applied before January 1, 2019.

Fiscal year prior to January 1, 2019

Leases are agreements that grant the right to use an asset for a defined period in return for a payment. Leases are accounted for as finance leases if substantially all the risks and rewards incidental to using the leased asset, and therefore beneficial ownership, are attributable to the lessee. As a result, the GEA companies that, as lessees, bear substantially all the risks and rewards associated with the leased asset, recognize the asset at the lower of fair value or the present value of minimum lease payments, and amortize the asset in subsequent periods over the shorter of the lease term or the asset's estimated useful life. A corresponding liability is recognized, which is amortized in the following periods using the effective interest method. Payments to the lessor are divided into an interest and a principal repayment element, with the interest element being recognized in profit or loss over the lease term as a continuous interest payment on the residual lease liability. All other leases under which GEA is a lessee are treated as operating leases. In these cases, the lease payments are recognized as an expense using the straight-line method.

Lease transactions under which GEA companies are the lessor and substantially all the risks and rewards associated with the leased asset are transferred to the lessee are accounted for as sales and financing business. A receivable is reported in the amount of the net investment under the lease. The interest income subsequently generated is recognized in profit or loss. All other lease transactions under which the group is the lessor are treated as operating leases. In this case, the asset leased for use remains on the balance sheet and is amortized. The lease payments are recognized as income using the straight-line method over the term of the lease.

Various companies included in the consolidated financial statements have sold and leased back items of property, plant and equipment in the past. Depending on the allocation of risk, these sale and leaseback transactions resulted in a finance lease or an operating lease. In the case of operating leases, the entire gain was recognized immediately if the asset was sold at fair value. If the asset was sold above its fair value, the difference between the selling price and fair value was deferred and recognized over the lease term.

Investment property

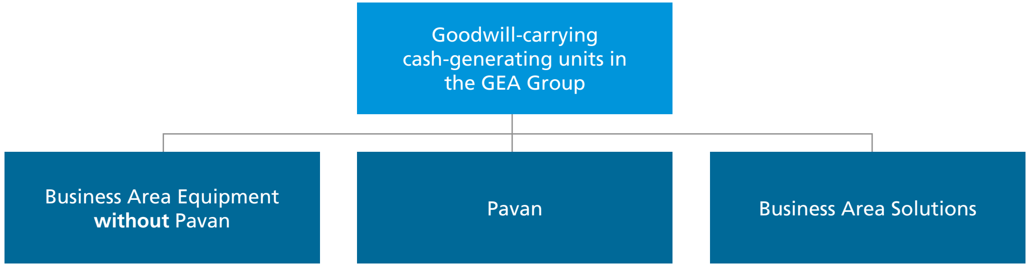
Property that is held to earn rentals or for capital appreciation is reported as investment property. In the case of property that is held partly to earn rentals and partly to produce or supply goods or services or for administrative purposes, the entire property is classified as investment property if the own use proportion is insignificant. This is assumed to be the case if the proportion is below 10 percent.

Cost is depreciated using the straight-line method over a period of between 10 and 50 years. The same measurement method is applied as for property, plant and equipment.

Goodwill

Goodwill arising from business mergers is recognized as an intangible asset.

Goodwill is tested for impairment at segment level at least once a year and also if any of the cash-generating units with goodwill are showing signs of impairment. In fiscal year 2019, the Executive Board of GEA, in its capacity as a control and monitoring organ, decided that it would pay greater attention to the subsidiary Pavan in the future. Due to this change in the monitoring structure and the associated reorganization of internal reporting, the reference date for the impairment test for goodwill was moved from December 31 to October 31. The reorganization in fiscal year 2019 meant that since October 31, 2019, GEA maintained the following three groups of cash-generating units bearing goodwill:



As a consequence of the change in control in fiscal year 2019, the goodwill of Pavan was reallocated. The goodwill was reallocated in accordance with IAS 36.87 and IAS 36.86. Historical values from the original Pavan acquisition were used as the benchmark for the allocation. This method results in a more appropriate allocation than a distribution according to relative values due to the proximity of the acquisition date of Pavan in November 2017.

For the purpose of impairment testing, the recoverable amount of the cash-generating units bearing goodwill is compared with its carrying amount including goodwill. The recoverable amount corresponds to the higher of the two amounts – value in use or fair value less costs of disposal.

The value in use of the cash-generating units carrying goodwill is determined annually using the discounted cash flow method. The estimate of the fair value less costs of disposal is only necessary if the value in use is lower than the carrying amount. Fair value less costs of disposal is generally the yardstick for measuring the impairment of business units classified as "held for sale."

If the carrying amount of the assets of a cash-generating unit with goodwill exceeds the recoverable amount, an impairment loss in the amount of the difference is recognized in profit or loss. An impairment loss initially reduces the carrying amount of goodwill. Any amount exceeding goodwill is allocated proportionately to the carrying amounts of non-current non-financial assets.

Other intangible assets

Other intangible assets include both internally generated and purchased assets. Internally generated intangible assets comprise capitalized development costs and internally developed software. In addition to contract-based rights, purchased intangible assets mainly contain technologies, brand names, and customer relationships. Technologies, brand names and customer relationships are usually acquired in connection with takeovers. Internally generated and purchased intangible assets are recognized at cost.

If the useful life of an intangible asset can be determined, the asset is amortized on a straight-line basis over its useful life. Intangible assets whose useful life cannot be determined are recognized at cost.

The carrying amount of an intangible asset is reviewed if it is likely to have been impaired by events or changes in circumstances. Intangible assets with an indefinite useful life are tested for impairment at least once a year. This requires the recoverable amount of the assets to be determined. The recoverable amount corresponds to the higher of the two amounts – value in use or fair value less costs of disposal. If the carrying amount is higher than the recoverable amount, the asset is written down to the recoverable amount. Previously recognized impairment losses are reversed if the reasons for the impairment no longer apply. Impairment losses are reversed up to a maximum of the amortized historical cost.

Indefinite-lived intangible assets are also examined each year to determine whether the classification of the asset as indefinite-lived can be retained. Any change to a finite useful life is applied prospectively.

Other financial assets

Other financial assets include investments in unconsolidated subsidiaries and other equity investments, other securities, financial receivables (except trade receivables) and derivative financial instruments.

Financial assets are recognized as soon as GEA receives a cash payment or is entitled to receive cash flows. In the case of regular way purchases of non-derivative financial assets, the settlement date, i.e. the delivery date of the financial assets, is decisive. Assets are derecognized as soon as the right to receive cash payments or other financial assets expires as a result of payment, waiver, statutory limitation, offsetting, or any other factor, or the right is transferred to another person, with the risks passing in full to the purchaser. In the case of regular way sales of non-derivative financial assets, the settlement date is taken to be the date of derecognition, in line with the principle used for recognition.

Items are originally recognized at fair value or, in the case of financial assets not measured at fair value, including directly attributable transaction costs.

Other equity investments not held for sale are allocated to the “at fair value through other comprehensive income” (FVOCI) measurement category. In some cases, the acquisition costs can be an appropriate estimate of the fair value. This can be the case if there is not enough current information available to measure fair value, or if there is a wide range of potential measurements for the fair value and the acquisition costs correspond to the best estimate of the fair value within that range.

Securitized debt instruments and other financial assets are to be classified on the basis of the company's business model for managing these assets and on the assets' contractual cash flow characteristics, and measured at amortized cost or at fair value. Any fluctuation in values during fair-value measurement are carried either through profit or loss or through other comprehensive income.

Financial assets measured at amortized cost are measured using the effective interest method in subsequent periods, and are to be checked for impairments. Gains and losses are recognized in profit or loss if the asset is derecognized, modified or impaired.

In the case of debt instruments measured at fair value through other comprehensive income, any interest income, remeasurements of currency translation gains/losses, and impairment losses/reversals of impairment losses are carried in the income statement and calculated in the same way as financial assets measured at amortized cost. The remaining changes in fair value are recognized in other comprehensive income. When the asset is derecognized, the accumulated gain or loss resulting from changes in fair value are reclassified to the income statement.

Derivative financial instruments are used exclusively for hedging purposes, in particular to hedge currency risk and to mitigate the risk of interest rate fluctuations resulting from financing transactions. They are always carried at fair value. If derivative financial instruments are not included in a designated hedging relationship, they are allocated to the "financial assets at fair value through profit or loss" (FVTPL) measurement category, and their fair value changes are recognized through profit or loss.

Deferred taxes

Deferred tax assets and liabilities are recognized for all temporary differences between the carrying amounts in the respective national tax accounts and those in the IFRS financial statements that are included in the consolidated financial statements. Deferred tax assets are also recognized for tax loss carryforwards. Deferred tax assets arising from deductible temporary differences and tax loss carryforwards are recognized only to the extent that there is likely to be sufficient taxable income available in future.

Deferred tax liabilities are not recognized on taxable temporary differences arising from investments in subsidiaries, associates, or joint ventures as long as the reversal of temporary differences is unlikely in the foreseeable future.

Inventories

Inventories are recognized at the lower of cost and net realizable value. Acquisition cost is calculated at average cost or using the first-in, first-out (FIFO) method. Production cost includes direct costs plus materials and production overheads, depreciation, and production-related administrative costs. Net realizable value is calculated as the estimated sale proceeds less costs incurred until completion, and selling expenses. Previously recognized impairment losses must be reversed if the reasons for the impairment no longer apply. Impairment losses are reversed up to a maximum of the amortized historical cost.

Costs of obtaining customer-specific project contracts (which are to be capitalized under IFRS 15) are carried in inventories and subject to scheduled amortization over the contract term. In cases where the amortization period would amount to one year or less, the incremental costs of obtaining a contract are expensed immediately.

Trade receivables

Trade receivables include no interest component and are recognized in the balance sheet at their principal amount less appropriate impairments.

Trade receivables that are sold to financial services companies under factoring agreements are derecognized once substantially all the risks and rewards have been transferred to the financial services company.

The classification and measurement of trade receivables are subject to the same criteria used for the other financial assets. Due to existing factoring arrangements, certain trade receivables are classified as "measured at fair value through other comprehensive income" (FVOCI).

Details of bad debt allowances on trade receivables are presented in section 3 of the notes to the consolidated financial statements.

Construction contracts

Revenues from construction contracts are recognized over time in accordance with the percentage-of-completion method pursuant to IFRS 15. This is so because customers can oversee such contracts per their specifications as contracted work progresses and because GEA is entitled to reimbursement of the costs incurred so far, plus an appropriate margin, if a customer cancels a contract. The percentage of completion is determined using the cost-to-cost method, which is derived from the ratio of contract costs incurred to the total estimated contract costs. Contracts are measured at production cost plus a profit in proportion to the stage of completion. Losses on construction contracts are immediately recognized in full in the fiscal year in which they are identified, regardless of the stage of completion. Provisions are set up for expected losses. If the contract costs incurred and the gains recognized exceed the progress billings and advance payments received or due, the excess amount is capitalized. This is reported under contract assets. If the advance payments received or due exceed the capitalized costs and recognized gains, less the progress billings at the reporting date, they are reported as a liability under contract liabilities.

If, when a performance obligation is being satisfied, the contract costs incurred are not proportionate to the progress of the performance of said contract, revenues will be recognized only in the amount of the contract costs incurred ("zero-profit method"). A profit is only recognized when the contract costs incurred are matched by corresponding progress of the performance of the contract.

Payments for differences in the overall contract, claims, and premiums are included in the contract revenue as variable components. The size of such payments is prudently calculated at contract inception using either the "expected-value" or the "most probable amount" method, depending on which of these is the more reliable for estimating the income.

Cash and cash equivalents

Cash and cash equivalents comprise cash, demand deposits, and financial assets that can be converted into cash at any time and that are subject to only slight fluctuations in value. Depending on the company's business model for managing these financial assets and on the assets' contractual cash flow characteristics, cash equivalents are recognized using the effective interest method, either at amortized cost or at fair value. Any fluctuation in values during fair-value measurement are carried either through profit or loss or through other comprehensive income.

Assets held for sale, liabilities held for sale, and discontinued operations

Non-current assets or groups of assets classified as "held for sale" within the meaning of IFRS 5 are recognized at the lower of carrying amount and fair value less costs of disposal. Classification as "held for sale" is made when the carrying amount of a non-current asset or disposal group will be recovered principally through a sale transaction rather than through continuing use, and the criteria defined in IFRS 5 have been met overall. The corresponding assets as well as the liabilities of a disposal group are reported separately in the balance sheet as "assets held for sale" and "liabilities held for sale." On initial classification as held for sale, non-current assets or assets and liabilities of disposal groups are first measured in accordance with the applicable IFRSs. They are measured at the lower of their carrying amount and fair value less costs of disposal, with disposal groups being measured as a whole. As the carrying amount of held-for-sale depreciable assets is principally realized by the disposal rather than the use of these assets, they are no longer depreciated once they have been reclassified.

If a disposal group represents a separate major line of business or geographical area of operation, it qualifies as a discontinued operation. The results of discontinued operations are reported separately in the income statement as profit or loss after tax from discontinued operations. In addition, the prior-year comparatives are adjusted in the income statement so that the results of these operations are also reported under discontinued operations. Cash flows from discontinued operations are reported separately in the cash flow statement; in this case as well the prior-year comparatives are adjusted accordingly. Revenue and expenditures from intragroup transactions are taken into account when presenting results from discontinued operations if they will continue to arise after the disposal of a discontinued operation.

As a general principle, the disclosures in the notes to the consolidated financial statements relate to the assets or liabilities recognized in the corresponding line items and to continuing operations. Where disclosures relate to GEA including assets held for sale, as well as the associated liabilities, and discontinued operations, this is indicated either by a statement that the disclosures refer to the complete group, or by another comment.

Subscribed capital

Ordinary shares are classified as equity. Treasury shares are deducted from the equity attributable to the shareholders of GEA Group Aktiengesellschaft.

Obligations under pension plans

Obligations under pension plans relate to post-employment benefit obligations. Defined benefit obligations are calculated using the projected unit credit method. The present value of these obligations reflects expected future salary and pension trends, since the entitlements earnable in the period up to the retirement age depend on these. Claims under supplementary healthcare benefit insurance are included in the actuarial measurement of assumptions made in respect of healthcare cost trends. The pension obligations are measured on the basis of actuarial reports by independent actuaries.

In order to provide these pension benefits, the company in some cases holds financial assets in long-term funds outside GEA and qualifying insurance policies. Insofar as the entitlements are funded by such external assets (plan assets), their fair value is offset against the present value of the defined benefit obligation. The resulting balance is reported under non-current employee benefit obligations or other non-current financial assets (net carrying amount).

Actuarial gains and losses from the remeasurement of the net carrying amount are recognized in other comprehensive income in the year in which they arise and reported in retained earnings after adjustment for tax effects. This also applies to the recognition of the difference between the actual returns on plan assets and the returns calculated using the discount factor. Costs from unwinding the discount on the net carrying amount are recognized in interest expenses; income is recognized in interest income. Current and past service cost for the period, as well as gains and losses from settlements, are recognized in the relevant function costs.

Other employee benefit obligations

Other employee benefit obligations comprise other long-term benefits and all short-term benefits. Short-term employee benefit obligations are expected to be settled in full no more than 12 months after completion of the service rendered. They include wages, salaries, social insurance contributions, paid vacation, and profit-sharing arrangements. They are recognized as an expense at the same time as the remunerated work or service is discharged. Any expenditure in excess of the payments already made is reported as a deferred liability at the reporting date. Other long-term employee benefits, such as jubilee payments or partial retirement arrangements, are recognized at the actuarial present value of the obligation at the reporting date. Securities are pledged to the beneficiaries to protect vested partial retirement credits against the employer’s insolvency. The fair value of these securities is offset against the corresponding liability.

Also reported under other employee benefit obligations are liabilities in respect of severance payments and redundancy plans resulting from, among other things, obligations in connection with restructuring provisions.

Provisions

Provisions for uncertain liabilities are recognized where there is a legal or constructive obligation to a third party, a future outflow of resources is likely, and the expected settlement value can be estimated reliably. The present value of the settlement amount is recognized if the time value of money is material. Amounts are discounted at the market rates for the appropriate maturity and currency. Discount unwinding costs are reported in interest expense.

When establishing warranty provisions, the warranty expense at the time when the reserve is recognized is reported in cost of sales. In all other cases, provisions are recognized when the product is accepted. The provision is measured on the basis of both the warranty expense actually incurred in the past and on the evaluated overall risk inherent in the system or product. Provisions are also recognized if a claim is made under a warranty and a loss is likely. Recourse claims against suppliers are capitalized if their services are subject to a warranty and it is highly likely that the claim can be enforced.

Provisions for expected losses from onerous contracts are recognized if the unavoidable costs of meeting the obligations under the contract exceed the economic benefits expected to be received under it. The unavoidable costs also include the unavoidable overheads needed to meet the contractual obligations.

Financial liabilities

Financial liabilities comprise bonds, bank loans, and lease liabilities (financial years beginning on or after January 1, 2019), and liabilities under finance leases (previous year). Initial recognition is at fair value, less transaction costs incurred. They are subsequently measured at amortized cost using the effective interest method. Lease liabilities are initially measured at the present value of the future leasing payments. The financial liabilities also include derivative financial instruments that are measured at fair value.

Other liabilities

The recognition and subsequent measurement of other liabilities is the same as for financial liabilities. Advance payments on orders, and the gross amount due to customers for contract work are carried under contract liabilities.

Contract liabilities

Advance payments on orders and the gross amount due to customers for contract work are carried under "contract liabilities." Advance payments on orders are stated at their principal amount. Please see the information provided on the recognition of construction contracts for the measurement of the gross amount due to customers for contract work.

Trade payables

Trade payables also include liabilities for goods received or services rendered that have not yet been invoiced, as there is only slight uncertainty as to the amount of the liability. Trade payables are recognized at fair value. This corresponds to the settlement amount in the case of liabilities due within one year.

Revenue recognition

Revenues from the sale of goods are recognized when such goods are transferred to the customer and the contractual performance obligations, therefore, met. Performance obligations are satisfied as the customer obtains control over the sold goods, i.e. when he can direct the use of and obtain substantially all of the remaining benefits from the goods. This normally occurs when the goods are handed over to the customer. Revenue from services is recognized when the service is rendered. Revenue is measured at the fair value of the consideration received or to be received. Customer bonuses, discounts, or rebates reduce the amount of revenue recognized. The effects of significant financing components can be ignored if the vendor expects, at contract inception, that the period between the transfer of a promised good or service to the customer and the date of payment will be one year or less.

Revenue from construction contracts is recognized using the percentage-of-completion method. The percentage of completion is determined using the cost-to-cost method, which is derived from the ratio of contract costs incurred to the total estimated contract costs. Contract costs include direct costs plus materials and construction overheads, depreciation, production-related administrative costs, and such other costs that are specifically chargeable to the customer under the terms of the contract. Adjustments are made for variations in contract work, claims, and incentive payments insofar as these will probably result in revenue that is capable of being reliably estimated. In addition, estimation limits must be observed.

In line with this method, construction contracts are measured at the amount of the contract costs incurred as of the reporting date plus the profit attributable to the proportion of work completed. Recognized revenue is reported under contract assets, less progress billings and advance payments received or due.

If the contract costs incurred are not proportionate to the progress of the performance while a performance obligation is being satisfied, revenues will be recognized only in the amount of the contract costs incurred. Contract costs are recognized as an expense in the period in which they are incurred. If it is foreseeable that total contract costs will exceed contract revenue, the expected loss is expensed as an impending loss according to IAS 37.

Share-based payment

In the first half of 2019, GEA still had a share-based payment program under which selected managers have been granted performance shares. The fair value of these rights was calculated at the grant date and allocated as an expense over the vesting period using the straight-line method; a corresponding provision was recognized. The provision was remeasured at each reporting date and at the payment date. The last tranche expired on June 30, 2019. Another share-based payment program is the long-term share price component anchored in the remuneration system for one of the Executive Board members. Payment from this remuneration component is dependent on the performance of GEA shares compared with a benchmark index. An additional share-based payment program was established for the Executive Board on January 1, 2019. The key performance targets of this Performance Share Plan are growth in earnings per share adjusted for the effects of restructuring measures and transactions, and share price growth plus the fictitious reinvestment of gross dividends (relative to a benchmark index). The entitlement from both the long-term share price component and the Performance Share Plan is measured at fair value at the reporting date. Changes in the fair value of the provision for share-based payment programs are recognized as interest expense or income (see section 6.3.3).

Research and development

Research expenditures are recognized immediately as an expense. Development costs that are designed to significantly enhance a product or process are capitalized if completion of the product or process is technically and economically feasible, the development is marketable, the expenditures can be measured reliably, and adequate resources are available to complete the development project. All other development expenditures are recognized immediately as expenses. Capitalized development expenditures for completed projects are reported at cost less cumulative amortization and impairment losses. Capitalized development costs for intangible assets not yet available for use are tested for impairment once a year.

Development costs that are required under construction contracts are capitalized as part of the cost of the asset.

Government grants

Government grants are recognized at fair value, provided that the group meets the conditions necessary to receive the grant. Government grants to cover expenses are recognized over the period in which the costs for which the grants were awarded are incurred. Government grants for capital expenditure are deducted from the cost of purchasing the corresponding asset.

Accounting in high-inflation economies

Financial statements are adjusted on the basis of historical costs of acquisition and sales, whereby line items in the balance sheet that are not yet expressed in a monetary unit must be translated using a general price index. The same applies to income and expenses. Monetary assets and liabilities do not need to be translated if they are subject to changes in price per contractual arrangements or are expressed as current values.

2.2 Estimates and management judgment

Preparation of financial statements requires management to make certain estimates and exercise judgment that may affect the company's assets, liabilities, provisions, and deferred tax assets and liabilities, as well as its income and expenses and contingent liabilities.

Factors that may cause amounts to fall below estimates might include a deterioration in the global economy, a substantial drop in demand from relevant customer industries, shifts between these industries with a negative impact on margins, movements in exchange rates and interest rates, as well as material litigation and changes in environmental or other legislation. Production errors, the loss of key customers, and rising borrowing costs may also adversely affect the group's future performance.

The recognition and measurement of the following assets and liabilities are in some cases based on management judgment. All assumptions represent the best of management's knowledge and belief in order to convey a true and fair view of the company's net assets, financial position, and results of operations. If actual circumstances subsequently differ from those forecast, this will affect the recognition and measurement of assets and liabilities. Depending on the item concerned, earnings may also be affected.

Acquisitions

Goodwill is reported in the balance sheet as a result of acquisitions. When an acquired company is initially consolidated, all its identifiable assets, liabilities, and contingent liabilities are recognized at their acquisition-date fair value. A basic problem is estimating these fair values. As a rule, land and buildings are measured on the basis of independent appraisals. If intangible assets are identified, their fair values are calculated using an appropriate measurement method. These measurements are made on the basis of assumptions by management with respect to the future value of the relevant assets and the discount rate. Obligations for contingent consideration are recognized on the basis of the current planning.

Goodwill and other intangible assets

The group tests goodwill for impairment annually. The recoverable amounts calculated for this purpose for the cash-generating units with goodwill are determined according to the higher of value in use and fair value less costs of disposal. The recoverable amount is calculated using assumptions by management (see section 5.3). As a consequence of the change of the reporting and monitoring structure in fiscal year 2019, the goodwill of Pavan was reallocated. By way of comparison, please refer to the supplementary disclosures on page 190 of section 2.1. Description of accounting policies.

In addition, the recognition and measurement of other intangible assets are based on management assumptions because they are also measured using the discounted cash flow method for the cash generating unit in whose balance sheet the asset is recognized.

Leases

GEA has concluded several leasing agreements, mainly in the real estate area, that include renewal and termination options, while some of its vehicle lease arrangements feature purchase options. Contractual terms of this kind offer GEA maximum operational flexibility. In assessing whether GEA is reasonably certain or not to exercise such options, GEA takes all facts and circumstances into consideration that are relevant in financial terms.

Taxes

GEA operates in a large number of countries and is therefore subject to different tax jurisdictions. Calculating tax liabilities requires management to make various estimates. Management believes that it has made a reasonable estimate of tax uncertainties. However, no assurance can be given that the actual outcome of these uncertainties will correspond to the estimates made. Any deviations may have an impact on the level of tax liabilities or deferred taxes in the year of the decision.

When assessing the recoverability of deferred tax assets, management judges the extent to which realization of the deferred tax assets is sufficiently likely. The question of whether the deferred tax assets can actually be realized depends on whether sufficient future taxable income can be generated against which the temporary differences or tax loss carryforwards can be offset. Management therefore analyzes the times at which the deferred tax liabilities reverse, and expected future taxable income. Management forecasts whether deferred tax assets can be realized on the basis of expected future taxable income. Deferred tax assets decline if the estimate of planned taxable income decreases, if tax benefits available as a result of tax strategies are reduced, or if the amount or timing of future tax benefits is restricted by changes in the law (see section 7.7).

Restructuring provisions

Restructuring provisions are recognized as soon as the company has a constructive obligation to carry out restructuring measures, having given notice of the restructuring plan to the parties affected. In assessing whether the criteria for recognition have been met, the management must make certain assumptions as to whether the announcement has given rise to valid expectations among the parties affected that the company will carry out the restructuring, and whether major changes to the restructuring plan are anticipated.

In order to determine the amount of the restructuring provisions, management must, above all, estimate the amount of the expected severance payments. To this end, the management must make assumptions with regard to the wage structure and length of service of the employees affected by the cuts, as well as to the manner in which the downsizing program is to be implemented.

Provisions and contingent liabilities

Changes in estimates of the probability of a present obligation, in the outflow of resources embodying economic benefits, and in the interest rate applicable could mean that items previously classified as contingent liabilities must be reported as provisions, or that the amount of provisions must be adjusted (see section 6.2). This also applies in particular to environmental obligations. In some cases, the duration of the expected obligations is far longer than the period for which interest rates with corresponding residual terms are available on the market. GEA therefore derives the interest rate to be applied for the appropriate term on the basis of reliable and most recently available historical market data over an extended period under review.

Obligations under pension plans

The present value of pension obligations depends on actuarial assumptions. These assumptions comprise discount rates, expected wage and salary increases, as well as the pension increase rate and mortality rates. These assumptions could differ significantly from actual future outcomes as a result of changes in market and economic conditions, and could therefore have a material effect on the level of the obligation and the related expenses.

The discount rate used to measure the net carrying amount is calculated at the end of each year. This is the rate used to calculate the present value of future cash outflows expected to be required to settle the obligation. In order to calculate the discount rate, the group uses the interest rate on high-quality corporate bonds denominated in the same currency in which the benefits are paid and whose terms to maturity correspond to those of the pension obligations.

Other significant assumptions relating to pension obligations are partly based on market conditions (see section 6.3.1).

Trade receivables

Individual trade receivables are tested for indications of impairment at each reporting date. The assessment of impairment risks is subject to uncertainty. Impairment losses are recognized in profit or loss. An impairment is recognized in the amount of the expected lifetime credit defaults. More information on credit risks in connection with trade receivables can be found in section 3.

Construction contracts

Due to the regulations in IFRS 15, discretion must be applied when judging whether revenues are to be recognized "over time" or not. GEA has come to the conclusion that revenue from construction contracts is to be recognized over time, since customers regularly obtain control over the sold goods if they direct the use as per their specifications as contracted work progresses and because GEA is entitled to reimbursement of the costs incurred so far, plus an appropriate margin, if a customer cancels a contract. GEA has determined that the input-based method is the most suitable for measuring service performance, since there is a direct connection between the construction work and the transfer of the service to the customer. GEA recognizes revenues on the basis of the contract costs incurred in relation to the total expected contract costs for the completion of the contract (cost-to-cost method). The recognition of construction contracts is also based on management's estimates of the cost of such contracts. Changes in estimates or differences between the estimated cost and the actual cost have a direct effect on recognized earnings from construction contracts. The operating units continuously review the estimates and adjust them if required.

Litigation

In some cases, GEA companies are parties to litigation. The outcome of this litigation could have a material effect on the group's net assets, financial position, and results of operations. Management regularly analyzes current information on these legal disputes and recognizes provisions for probable obligations, including estimated legal costs. Both internal counsel and external lawyers are used to make this assessment. When deciding on the need to recognize provisions, management takes into account the probability of an unfavorable outcome and its ability to estimate the amount of the obligation with sufficient reliability. The filing of a suit or the formal assertion of a claim against a GEA company does not necessarily mean that a provision must be recognized for the related risk (see section 8.3).

3. Financial Risk Management

The Executive Board has put in place an effective set of guidelines to manage and hence largely limit or hedge financial risks throughout the group. The objectives with regard to protecting assets, eliminating gaps in security, and improving efficiency in identifying and analyzing risks are clearly defined, as are the relevant organizational structures, powers, and responsibilities. The guidelines are based on the principles of system security, the separation of functions, transparency, and immediate documentation. For further information, please see the discussion of the risk management system in the management report.

GEA is exposed to currency, interest rate, commodity price, credit, and liquidity risk in the course of its ordinary activities because it operates worldwide. Financial risk management aims to reduce this risk through the appropriate use of derivative and nonderivative hedging instruments.

Currency risk

Because GEA operates internationally, its cash flows are denominated not only in euros, but also in a number of other currencies, particularly U.S. dollars. Hedging the resulting currency risk is a key element of risk management.

The group guideline requires all group companies to hedge foreign currency items as they arise in order to fix prices on the basis of hedging rates. Currency risks are hedged for recognized hedged items, unrecognized firm commitments, and highly probable transactions. The hedging periods are determined by the maturity of the hedged items and are usually up to 12 months, but in exceptional cases may exceed that period significantly. Despite the hedging requirement, changes in exchange rates may affect sales opportunities outside the eurozone.

As a general rule, affiliated group companies are obliged to tender all outstanding exposures relating to transactions in goods and services in major transaction currencies to GEA's central Treasury and Corporate Finance unit. Most of these exposures are passed on directly to banks at matching maturities, depending on the hedging objective of the derivatives and the related accounting treatment. They may also be hedged as part of a portfolio. In addition, most intra-group borrowing arrangements in foreign currencies managed via the central Treasury & Corporate Finance unit are hedged directly to banks.

The hedging of financial transactions and transactions conducted by subsidiaries outside the eurozone is also coordinated with the central Treasury and Corporate Finance unit.

Interest rate risk

Because GEA operates worldwide, liquidity is raised and invested in the international money and capital markets in different currencies (but mainly in euros) and at different maturities. The resulting financial liabilities and investments are exposed to interest rate risk, which must be assessed and managed by central financial risk management. Derivative financial instruments may be used on a case-by-case basis to hedge interest rate risk and reduce the interest rate volatility and financing costs of the hedged items. Only the central Treasury and Corporate Finance unit is permitted to enter into such interest rate hedges.

Commodity price risk

GEA requires various metals such as aluminum, copper, and steel, whose purchase prices can be subject to substantial fluctuations depending on the market situation. Long-term supply agreements have been entered into with various suppliers in order to hedge commodity price risk.

Credit risk

The credit risk or default risk is the risk of a commercial partner no longer being in a position to meet obligations arising from a financial instrument or customer contract, with this event leading to financial loss. The Group is exposed to default risk from both its operative business (especially in the case of trade receivables) and its financing operations (including bank deposits, foreign exchange transactions and other financial instruments).

The maximum default risk is limited to the carrying amount of the financial instruments and the contract assets.

Impairments on financial instruments measured at fair value through other comprehensive income amounted to EUR 7,281 thousand (previous year: EUR 8,364 thousand) as of the reporting date.

Trade receivables and contract assets

The financial standing of potential customers is ascertained via an internal risk board procedure before orders are accepted. Active receivables management, including nonrecourse factoring and credit insurance, is also performed. In the case of export transactions, confirmed and unconfirmed letters of credit are used alongside sureties, guarantees, and cover notes, including from export credit agencies such as Euler Hermes. An addition to local monitoring by the subsidiary, GEA oversees the main credit risks at group management level so that any accumulation of risk can be better managed. Since trade receivables and contract assets are usually due from a large number of customers spanning different industries and regions, there is no concentration of risk.

GEA applies the “simplified approach” to trade receivables and contract assets, and recognizes lifetime credit losses as soon as they accrue. In the context of this simplified approach, GEA calculates expected credit losses according to risk category, while taking historic loss rates into account. Assignment to a specific risk category is based on common credit risk attributes. For GEA, these are the customer’s geographical location and whether the related assets are overdue or not. In order to take forward-looking information into account, historic loss rates were adjusted using scaling factors based on predictions of the gross domestic product (GDP) of the corresponding regions.

Contract assets relate to ongoing work that has yet to be invoiced. Essentially, they exhibit the same risk characteristics as trade receivables for the same types of contract. GEA has thus concluded that the predicted loss rates for trade receivables that are not overdue constitute a best estimate with which to represent the loss rates pertaining to contract assets.

An individual impairment is made when one or more events have occurred that adversely affect the debtor’s financial standing. These events include delays in payment, threat of insolvency, and concessions made by the debtor due to payment difficulties.

Trade receivables and contract assets are derecognized immediately when there is reasonable doubt as to their realizability, for instance, if the debtor is found to be insolvent.

The table below shows the expected credit losses on trade receivables and contract assets not credit-impaired as of December 31, 2019:

(EUR thousand)	Gross carrying amount	Weighted average loss rate	Range of loss rates	Loss allowance
Not overdue	1,011,975	0.07%	0.02% - 0.16%	694
of which contract assets	407,928	0.03%	0.02% - 0.16%	130
of which trade receivables	604,047	0.09%	0.02% - 0.16%	564
Overdue (trade receivables)	257,289	0.27%	0.07% - 0.46%	692
Total	**1,269,264**			**1,386**

The table below shows the expected credit losses on trade receivables and contract assets not credit-impaired as of December 31, 2018:

(EUR thousand)	Gross carrying amount	Weighted average loss rate	Range of loss rates	Loss allowance
Not overdue	1,066,227	0.06%	0.02% - 0.13%	658
of which contract assets	461,278	0.03%	0.02% - 0.13%	139
of which trade receivables	604,949	0.09%	0.02% - 0.13%	519
Overdue (trade receivables)	247,270	0.30%	0.05% - 0.34%	751
Total	**1,313,497**			**1,409**

The table below reconciles the impairments on trade receivables and contract assets as of January 1 with the impairments as of December 31:

	2019	2018
Impairments as of January 1 according to IAS 39	**–**	**59,654**
adjustment initial application of IFRS 9	–	709
Impairments as of January 1 according to IFRS 9	**66,424**	**60,363**
Derecognition	–9,593	–11,369
Expenses from remeasurement of impairments (Reversal)	–12,303	–1,844
Income from remeasurement of impairments (Addition)	30,116	19,079
Exchange rate effects	361	–523
Other changes	241	718
Impairments as of December 31	**75,246**	**66,424**

The other changes concern effects from the change in the basis of consolidation.

The change in the impairments is essentially related to credit-impaired trade receivables and contract assets. In fiscal year 2019, impairments in the Asia Pacific region rose by EUR 5,545 thousand. In the remaining regions, impairments rose by EUR 3,277 thousand. In the previous year, impairments in the North America region rose by EUR 3,514 thousand and in the remaining regions by EUR 2,547 thousand.

In fiscal year 2019, trade receivables with a contractual amount of EUR 274 thousand (previous year: EUR 3,734 thousand) are still subject to enforcement activity.

Any collateral for trade receivables or contract assets had no material effect on the scale of the impairments calculated.

Cash and cash equivalents

The counterparty limit system for cash and cash equivalents used by GEA for financial risk management aims to continuously assess and manage counterparty default risk. A maximum risk limit has been defined for each counterparty, which in most cases is derived from the ratings from recognized credit rating agencies and credit default swaps. Appropriate action is taken if the individual limit is exceeded. These measures serve to avoid a concentration of risks.

Cash and cash equivalents are deposited with banks and financial institutions rated BB- through AA- by Standard and Poor's (S&P) as of the reporting date.

The estimated impairment on cash and cash equivalents was calculated on the basis of expected losses within a 12-month period. External ratings and short remaining maturities lead GEA to believe that the credit risk pertaining to its cash and cash equivalents is low. No significant impairments on cash and cash equivalents were identified in fiscal year 2019.

Other financial assets

GEA calculates expected credit losses on its other financial assets according to risk category, while taking published credit ratings and credit default swaps into account. Assignment to a specific risk category is based on the geographical location of the counterparty. When losses accrue, the estimated impairment is calculated on the basis of expected losses within a 12-month period. GEA assumes that the credit risk has increased significantly if the credit risk deteriorates by two rating levels within a fiscal year. In that case, the expected credit losses over the entire remaining maturity are recorded.

The procedures for effecting individual impairments and derecognizing other financial assets are comparable with those applied to trade receivables and contract assets.

So as to reduce the credit risk involved, derivative financial instruments are only entered into with reputable financial institutions.

As of December 31, 2019, impairments on other financial assets totaled EUR 3,980 thousand (previous year: EUR 1,881 thousand). The increase of EUR 2,099 thousand was mainly due to the addition of impairments on credit-impaired financial assets. In the previous year, the impairment fell by EUR 1,345 thousand. This was mainly due to the derecognition of credit-impaired financial assets.

Liquidity risk

GEA is exposed to liquidity risk in that it may be unable to meet payment obligations because it has insufficient cash funds at its disposal. GEA is responsible for managing this risk. The funds are made available to the companies by group management. Cash flow from operating activities is the most important source of liquidity. Cash pools have been established in 17 countries in order to optimize borrowing and the use of cash funds within GEA. To achieve this, the cash pools automatically balance the accounts of the participating group companies every day by crediting or debiting a target account at GEA Group Aktiengesellschaft. This prevents separate cash investments and borrowings by these companies to a large extent. Any additional liquidity requirements are generally borrowed by the GEA Group Aktiengesellschaft, which also invests surplus liquidity.

The following tables show the undiscounted contractually agreed interest and principal payments for financial liabilities, including derivative financial instruments with negative fair values:

		Cash flows					
(EUR thousand)	Carrying amount	< 1 year	1-2 years	2-3 years	3-4 years	4-5 years	> 5 years
2019							
Trade payables	741,956	740,086	1,870	–	–	–	–
Borrower's note loan	251,796	2,702	2,702	2,702	130,631	1,580	123,507
Liabilities to banks	74,343	23,624	71	493	282	–	50,000
Liabilities under finance leases	182,154	59,988	46,858	28,701	17,744	14,419	26,867
Liabilities to investees	209	9	200	–	–	–	–
Currency derivatives not included in a recognized hedging relationship	5,513	474,966	11,414	428	–	–	–
Other financial liabilities	97,344	82,651	12,740	1,865	1,947	131	6,307
2018							
Trade payables	723,334	722,702	632	–	–	–	–
Borrower's note loan	251,712	2,700	2,700	2,700	2,700	130,629	125,086
Liabilities to banks	68,391	18,730	983	301	47	47	50,093
Liabilities under finance leases	6,395	2,413	1,346	2,166	887	122	–
Liabilities to investees	426	226	200	–	–	–	–
Currency derivatives not included in a recognized hedging relationship	6,794	560,099	7,182	–	–	–	–
Other financial liabilities	97,139	73,675	19,648	126	128	131	6,307

All financial liabilities outstanding as of December 31, 2019, are included in the table above on the basis of expected contractual cash flows. Projected figures for future new liabilities are not taken into account. Foreign currency amounts are translated at the closing rates. In the case of financial liabilities that can be repaid at any time, it is assumed that they will be repaid within one year.

Payments for derivative financial instruments totaling EUR 486,808 thousand (previous year: EUR 567,281 thousand) were partially offset by payments received from these instruments of EUR 481,826 thousand (previous year: EUR 563,764 thousand).

As of December 31, 2019, the group held cash credit lines of EUR 1,133,689 thousand (previous year: EUR 1,123,694 thousand), of which EUR 324,269 thousand had been utilized (previous year: EUR 318,207 thousand). The cash credit lines are composed of the following items:

(EUR thousand)	Maturity	12/31/2019 approved	12/31/2019 utilized	12/31/2018 approved	12/31/2018 utilized
Borrower's note loan (2023)	February 2023	128,000	128,000	128,000	128,000
Borrower's note loan (2025)	February 2025	122,000	122,000	122,000	122,000
European Investment Bank	December 2025	150,000	50,000	150,000	50,000
Bilateral credit lines	until further notice	83,689	24,269	73,694	18,207
Syndicated credit line ("Club Deal")	August 2022	650,000	–	650,000	–
Total		**1,133,689**	**324,269**	**1,123,694**	**318,207**

Section 6.4 contains more information on GEA's financial liabilities.

As of December 31, 2019, guarantee lines for the performance of contracts, advance payments, and warranty obligations of EUR 1,316,415 thousand were available to the group as a whole (previous year: EUR 1,321,007 thousand), EUR 425,688 thousand of which has been utilized (previous year: EUR 536,053 thousand). The guarantees are generally payable at first demand. As is generally the case for this type of order collateral and financing instrument, GEA Group Aktiengesellschaft drew on guarantees only in extremely rare cases in recent years.

As of December 31, 2019, EUR 4,731 thousand (previous year: 11,211 thousand) of bank guarantees under GEA Group Aktiengesellschaft credit lines were granted to customers of the GEA Heat Exchangers Segment (HX), which was sold as of October 31, 2014, to collateralize the segment's contractual obligations. The purchaser of the GEA HX segment has granted bank guarantees of EUR 1,523 thousand (previous year: EUR 3,363 thousand) in favor of GEA Group Aktiengesellschaft to cover the unlikely event of default.

In addition, GEA Group Aktiengesellschaft has issued group guarantees of EUR 41,215 thousand (previous year: EUR 46,235 thousand) to collateralize the GEA HX segment's contractual obligations. To hedge the risk of claims being made under the guarantees, GEA Group Aktiengesellschaft has received bank guarantees from the purchaser of the GEA HX segment in the amount of EUR 12,292 thousand (previous year: EUR 14,189 thousand).

As of the year-end, EUR 0 thousand (previous year: EUR 0 thousand) of bank guarantees under GEA Group Aktiengesellschaft credit lines and EUR 96,300 thousand (previous year: EUR 94,483 thousand) of group guarantees were granted to Lurgi AG's customers to collateralize that company's contractual obligations in the unlikely event of default.

Foreign currency sensitivity analysis

GEA companies are always exposed to foreign currency risk if their cash flows are denominated in a currency other than their own functional currency. As a general principle, foreign currency risks must be hedged using appropriate financial instruments so that fluctuations arising from the hedged item (underlying) and the hedging transaction are neutralized over their duration.

The foreign currency risk presented in the sensitivity analysis results from the following transactions:

- From recognized foreign currency transactions:
  The translation of foreign currency receivables or liabilities at the closing rate has a direct effect on profit or loss.
- From currency derivatives:
  If the hedge has been effected for economic reasons and is not included in a documented hedging relationship, a corresponding currency risk exposure will have a direct effect on earnings.

The currency pairs in which the major part of the foreign currency cash flows are settled are included as relevant risk variables in the foreign currency sensitivity analysis. The following table shows the sensitivity of a 10 percent increase or decrease in the euro from the perspective of the group:

(EUR thousand)		net risk exposure	Profit/loss for the year	
Base currency	Foreign currency		2019	
			+ 10 %	- 10 %
EUR	USD	–59,757	5,400	–6,600
EUR	GBP	52,312	–4,763	5,822
EUR	CNY	44,143	–3,998	4,887
EUR	INR	16,497	–1,500	1,833
EUR	CHF	–16,248	1,479	–1,807
EUR	HKD	–14,765	1,371	–1,676

(EUR thousand)		net risk exposure	Profit/loss for the year	
Base currency	Foreign currency		2018	
			+ 10%	- 10%
EUR	USD	–67,147	6,692	–8,179
EUR	DKK	–72,870	6,637	–8,112
EUR	CNY	49,977	–4,519	5,524
EUR	GBP	39,260	–3,548	4,337
EUR	HKD	–24,591	2,237	–2,734
EUR	INR	14,765	–1,343	1,642

The net risk relates to all contractually agreed foreign currency cash flows, collated into a single net item, and translated into euros at the closing rate. Net positions with a positive sign represent future cash inflows in foreign currency. Net positions with a negative sign represent future cash outflows.

Interest rate sensitivity analysis

The interest rate sensitivity analysis presents the effects of changes in market interest rates on interest income and expenses, and equity. The sensitivity analyses are based on the following assumptions:

- Nonderivative fixed-rate financial instruments are exposed to on-balance-sheet interest rate risk only if they are measured at fair value. GEA measures such financial instruments at amortized cost.
- Nonderivative variable-rate financial instruments whose interest payments are not included as hedged items in a hedging relationship that is recognized as a cash flow hedge are subject to interest rate risk in the income statement.
- Interest rate derivatives included in a hedging relationship that is recognized as a cash flow hedge are subject to equity-related interest rate risk in the amount of the effective portion of the hedging relationship.
- Interest rate derivatives not included in a hedging relationship that is recognized as a cash flow hedge are subject to interest rate risk in the income statement.
- Currency derivatives are not subject to material interest rate risk and therefore have no effect on interest rate sensitivity.

The sensitivity analysis assumes a linear shift in the yield curves for all currencies of +100 or -100 basis points as of the reporting date. This results in the following effects for the simulated scenarios:

	12/31/2019		12/31/2018	
(EUR thousand)	+ 100 basis points	- 100 basis points	+ 100 basis points	- 100 basis points
Interest rate risk recognized in profit or loss	–969	22	–952	117

The calculation is based on a net volume of EUR 122,647 thousand (previous year: EUR 106,999 thousand).

Capital management

GEA Group Aktiengesellschaft's key financial objective is to sustainably increase its enterprise value in the interests of investors, employees, customers, and suppliers, while safeguarding and securing the group's solvency at all times.

Improving profitability and, as a result, increasing the return on capital employed therefore takes priority in all business decisions. Our strict focus on contract margin quality is also derived from this. Equally, external growth through potential acquisitions is viewed from the perspective of this goal.

Capital management, in the form of generating sufficient liquidity reserves, plays a crucial role in the pursuit of these enterprise goals. Not only does it ensure GEA's long-term existence, it also creates the entrepreneurial flexibility needed to enhance and update current business activities and to take advantage of strategic opportunities. It is achieved by managing liquidity reserves and available credit lines on an ongoing basis using short- and medium-term forecasts of future liquidity trends and borrowing requirements.

The group's financial management encompasses liquidity management, group financing, and the management of interest rate and exchange rate risks. The central financial management operations within GEA Group Aktiengesellschaft are responsible for reducing financing costs as far as possible, optimizing interest rates for financial investments, minimizing counterparty credit risk, leveraging economies of scale, hedging interest rate and exchange rate risk exposures as effectively as possible, and ensuring that loan covenants are complied with. The goal of GEA's financing strategy is not only to be able to meet its payment obligations whenever they fall due, but also to ensure that sufficient cash reserves are always available in the form of credit lines, in addition to maintaining a strategic cash position. The centralized liquidity portfolio is managed mainly for capital preservation and risk reduction by diversifying the cash investments.

The capital structure is monitored regularly using various key financial indicators so as to optimize capital costs. Core indicators include the equity ratio and the net debt to equity ratio (gearing). Net debt for the complete group is calculated as follows:

(EUR thousand)	12/31/2019	12/31/2018
Liabilities to banks	–74,343	–68,391
Borrower's note loan	–251,796	–251,712
Cash and cash equivalents	354,559	247,900
Net liquidity (+)/Net debt (-)	**28,420**	**–72,203**
Equity	**2,090,094**	**2,449,436**
Equity ratio	**36.6%**	**42.8%**
Gearing	–1.4%	2.9%

Net liquidity rose by EUR 100,623 thousand in the course of the financial year, closing the year at EUR 28,420 thousand on December 31, 2019.

Two international rating agencies, Moody's and Fitch, again rated GEA Group Aktiengesellschaft's ability to meet its financial obligations. The ratings for GEA are as follows:

	2019		2018	
Agency	Rating	Outlook	Rating	Outlook
Moody's	Baa2	negative	Baa2	stable
Fitch	BBB	negative	BBB	negative

GEA's investment grade rating in the "BBB" range ensures that it has good financing opportunities both with banks and directly on the capital markets. The current ratings reflect GEA's strong solvency and ensure access to the international financial markets.

4. Divestments

4.1 Companies sold

In fiscal year 2019, GEA sold the following corporate group via the sale of shares:

Business	Head office	Sale Date	Percentage of voting interest (%)	Consideration received (EUR)
GEA de Klokslag Engineering B.V.	Bolsward (Netherlands)	November 6, 2019	100.0	1
GEA de Klokslag Automatisering B.V.	Bolsward (Netherlands)	November 6, 2019	100.0	1
GEA de Klokslag Machinefabriek B.V.	Bolsward (Netherlands)	November 6, 2019	100.0	1

On November 6, 2019, GEA completed the sale of its shares in the Dutch corporate group de Klokslag; all shares in the group's parent company, GEA de Klokslag Engineering B.V., were sold.

The de Klokslag group specialized in manufacturing large-scale equipment for semi-hard cheese production, and was allocated to the Business Area Solutions. The transaction comprised the sale of the business for manufacturing production systems, specifically pressing and salting solutions for semi-hard cheeses. The sale of the de Klokslag group is another step forward in GEA's efforts to streamline its global production footprint.

The de Klokslag group, which comprises the parent company GEA de Klokslag Engineering B.V. and the two subsidiaries GEA de Klokslag Automatisering B.V. and GEA de Klokslag Machinefabriek B.V., was sold for EUR 3, i.e. EUR 1 for each of the companies. The sale produced deconsolidation losses of EUR 14,387 thousand for GEA's account, plus additional expenses of EUR 2,247 thousand. Restructuring expenses of EUR 16,104 thousand were recognized in connection with the sale of the de Klokslag group.

4.2 Assets and liabilities sold

At the time of the sale, the following assets and liabilities were sold:

(EUR thousand)	2019
Property, plant and equipment	–1,789
Deferred taxes	–1,737
Inventories	–387
Contract assets	–3,417
Trade receivables	–959
Other current financial assets	–879
Cash and cash equivalents	–12,630
Total assets	**–21,799**
Non-current financial liabilities	1,514
Deferred taxes	2,987
Current provisions	834
Trade payables	1,021
Other current liabilities	1,056
Total equity and liabilities	**7,412**
Net assets and liabilities	–14,387
Consideration received, satisfied in cash	0
Cash and cash equivalents disposed of	–12,630
Net cash outflows	–12,630

5. Consolidated balance sheet disclosures: Assets

5.1 Property, plant and equipment

Property, plant and equipment changed as follows:

(EUR thousand)	Land and buildings (owner-occupied)	Technical equipment and machinery	Other equipment, operating and office equipment	Assets under construction	Total
Jan. 1, 2018					
Cost	553,908	499,138	343,215	35,858	**1,432,119**
Cumulative depreciation and impairment losses	–274,571	–376,686	–272,298	–3,691	**–927,246**
Carrying amount	**279,337**	**122,452**	**70,917**	**32,167**	**504,873**
Changes in 2018					
Additions	5,586	21,921	28,322	35,254	**91,083**
Disposals	–5,273	–2,850	–1,516	–299	**–9,938**
Depreciation	–15,657	–23,460	–21,845	–45	**–61,007**
Impairment losses	–101	–162	–34	–	**–297**
Changes in consolidated group and business combinations	1,381	408	916	1	**2,706**
Currency translation	–499	–81	–425	–360	**–1,365**
Other changes	4,729	7,615	835	–20,528	**–7,349**
Carrying amount at Dec. 31, 2018	**269,503**	**125,843**	**77,170**	**46,190**	**518,706**
Jan. 1, 2019					
Cost	551,382	506,920	355,740	47,826	**1,461,868**
Cumulative depreciation and impairment losses	–281,879	–381,077	–278,570	–1,636	**–943,162**
Carrying amount	**269,503**	**125,843**	**77,170**	**46,190**	**518,706**
Right-of-Use assets due to initial application of IFRS 16	133,569	937	42,612	–	**177,118**
Adjusted carrying amount	**403,072**	**126,780**	**119,782**	**46,190**	**695,824**
Changes in 2019					
Additions	52,376	17,755	48,663	35,654	**154,448**
Disposals	–2,587	–563	–1,017	–1,508	**–5,675**
Depreciation	–52,732	–26,054	–46,601	–167	**–125,554**
Impairment losses	–366	–781	–121	–167	**–1,435**
Changes in consolidated group and business combinations	8	74	277	–	**359**
Currency translation	1,876	583	360	582	**3,401**
Other changes	9,717	12,444	2,296	–27,301	**–2,844**
Carrying amount at Dec. 31, 2019	**411,364**	**130,238**	**123,639**	**53,283**	**718,524**
Dec. 31, 2019					
Cost	728,224	527,976	433,394	55,170	**1,744,764**
Cumulative depreciation and impairment losses	–316,860	–397,738	–309,755	–1,887	**–1,026,240**
Carrying amount	**411,364**	**130,238**	**123,639**	**53,283**	**718,524**

As in the previous year, items of property, plant and equipment are depreciated on a straight-line basis using the relevant residual values and the following useful lives:

	Useful life in years
Buildings and parts of buildings	2 to 50
Technical equipment and machinery, other equipment	2 to 25
Operating and office equipment	2 to 40

The underlying residual values and useful lives are reviewed at each reporting date and adjusted if necessary.

Leasing

Material lease agreements are to be found primarily in the areas of real estate and vehicles. The average residual term of real-estate lease agreements is around three years, for vehicle leases it is around two years

The carrying amounts of the right-of-use assets, including changes during the reporting period, are shown below.

(EUR thousand)	Land and buildings	Technical equipment and machinery	Other equipment, operating and office equipment	Vehicles	Computer Hardware	Other IT Equipment	Right-of-use-assets in property, plant and equipment	Right-of-use-assets in investment property	Total
Jan. 1, 2019									
Carrying amount	140,399	937	2,743	37,249	89	6,145	187,562	97	**187,659**
Changes in 2019									
Additions	37,268	927	606	23,940	87	23	62,851	–	**62,851**
Disposals	–1,551	–2	–	–	–	–	–1,553	–	**–1,553**
Depreciation	–40,205	–707	–1,341	–21,517	–96	–1,867	–65,733	–53	**–65,786**
Currency translation	617	1	7	157	–	–	782	–	**782**
Other changes	52	–	–145	–	–	–	–93	–40	**–133**
Carrying amount at Dec. 31, 2019	**136,580**	**1,156**	**1,870**	**39,829**	**80**	**4,301**	**183,816**	**4**	**183,820**

The following amounts were recognized in the income statement in the reporting period:

(EUR thousand)	01/01/2019 - 12/31/2019
Interest expenses for Lease Liabilities	4,997
Income from sublease contracts	41
Expense from short-term leases	3,862
Expense for low value assets	4,835
Expense from variable lease payments	4,357

The following amounts were recognized in the cash flow statement:

(EUR thousand)	01/01/2019 - 12/31/2019
Total payments for lease agreements	81,534

As a lessor GEA leases out real estate. The underlying lease agreements were classified as operating leases. Please refer to the disclosures in section 5.2.

5.2 Investment property

The following table shows the changes in investment property:

(EUR thousand)	Land	Buildings	Total
Jan. 1, 2018			
Cost	5,708	6,028	**11,736**
Cumulative depreciation and impairment losses	–3,688	–5,633	**–9,321**
Carrying amount	**2,020**	**395**	**2,415**
Changes in 2018			
Disposals	–	–	**–**
Depreciation	–	–54	**–54**
Other changes	–7	–	**–7**
Carrying amount at Dec. 31, 2018	**2,013**	**341**	**2,354**
Jan. 1, 2019			
Cost	5,701	6,028	**11,729**
Cumulative depreciation and impairment losses	–3,688	–5,687	**–9,375**
Carrying amount	**2,013**	**341**	**2,354**
Right-of-Use assets due to initial application of IFRS 16		97	**97**
Adjusted carrying amount	**2,013**	**438**	**2,451**
Changes in 2019			
Disposals	–134	–	**–134**
Depreciation	–	–76	**–76**
Other changes	–	–40	**–40**
Carrying amount at Dec. 31, 2019	**1,879**	**322**	**2,201**
Dec. 31, 2019			
Cost	5,567	6,047	**11,614**
Cumulative depreciation and impairment losses	–3,688	–5,725	**–9,413**
Carrying amount	**1,879**	**322**	**2,201**

The fair value of investment property is EUR 5,000 thousand (previous year: EUR 4,700 thousand). Since these fair values are calculated on the basis of comparable market-based prices that are determined internally, they are categorized within Level 2 of the fair value hierarchy.

The following amounts are reported in the income statement in connection with investment property:

(EUR thousand)	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
Rental income	816	733
Operating expenses	219	260
thereof: properties used to generate rental income	219	260
Total	**597**	**473**

5.3 Goodwill

The following table shows the allocation of goodwill to the cash-generating units bearing goodwill:

(EUR thousand)	BA Equipment (in 2019 without Pavan)	BA Solutions	Pavan (in 2019)	Total
Carrying amount at Dec. 31, 2017*	**1,120,088**	**614,318**	**–**	**1,734,406**
Additions	2,637	15,197	–	17,834
Disposals	–534	–	–	–534
Impairment losses	–	–	–	–
Currency translation	3,248	336	–	3,584
Reclassification	1,244	–1,244	–	–
Carrying amount at Dec. 31, 2018	**1,126,683**	**628,607**	**–**	**1,755,290**
Additions	–	–	–	–
Disposals	–	–	–	–
Impairment losses	–	–	–247,589	–247,589
Currency translation	2,733	1,747	–	4,480
Reclassification	–247,589	–	247,589	–
Carrying amount at Dec. 31, 2019	**881,827**	**630,354**	**–**	**1,512,181**

*) The purchase price allocation for the Pavan group acquired in fiscal year 2017 was finalized in the fourth quarter of 2018 resulting in changes to the comparative figures as of December 31, 2017.

Impairment test

Due to the change of the reporting and monitoring structure in fiscal year 2019, the cash-generating units with goodwill, Business Area Equipment and Business Area Solutions, were tested for impairment just before goodwill was reallocated. The test did not identify a need for impairment. After the Business Area Equipment and the Business Area Solutions had been tested, the cash-generating units with goodwill, Business Area Equipment (excluding Pavan), Business Area Solutions, and Pavan were tested for impairment as of October 31, 2019. For the purpose of impairment testing, the recoverable amounts of the cash-generating units with goodwill are compared with their carrying amounts, including goodwill.

The recoverable amount for these units is determined by calculating the value in use and the fair value less costs of disposal using the discounted cash flow method. The cash flows used are the after-tax operating cash flows from the consolidated medium-term planning prepared by the Executive Board. Besides the budget for 2020, this covers two further planning years. The corresponding planning values were extrapolated using a bottom-up approach. The Supervisory Board has taken note of the corresponding plans. Assumptions for the period beyond the planning horizon are based on the cash flows in the previous planning year, extrapolated using a uniform growth rate of 1.0 percent (previous year: 1.5 percent). The underlying growth rates do not exceed the average long-term growth rates for the markets in which GEA operates.

The planning assumes continued stable growth in the food and drink sales markets. This assumption is based on an expectation of growing demand for processed foods. All three cash-generating units of GEA with goodwill stand to profit from this assumed trend. Growth is also assumed for the other customer industries. These trends thus apply to the three units under review. In addition, planned growth for individual areas also takes account of actual past growth rates.

With regard to raw material prices, it is assumed that any increase can be offset by increased selling prices. Future acquisitions are not included in the planning process.

Overall, a moderate increase in earnings is assumed.
Differences between historic planning figures for Pavan and the cash flows subsequently observed were accounted for by applying an appropriate planning discount.

The total cost of capital assumed for discounting is based on a risk-free interest rate of 0.00 percent (previous year: 1.00 percent) and a market risk premium of 8.00 percent (previous year: 6.75 percent). In addition, beta factors derived from the respective peer group, a borrowing risk premium and capital structure were taken into account for each measurement object. Accordingly, specific tax rates, country risk premiums and inflation differentials are also applied to the cash-generating units with goodwill.

Cash flows for the individual areas are discounted using the following after-tax interest rates:

Discount rate (%)	10/31/2019	12/31/2018
BA Equipment (without Pavan)[1]	8.01	7.27
BA Solutions[2]	7.29	6.96
Pavan[3]	9.00	–

1) The pre-tax interest rate relevant for BA Equipment is 10.81 percent (previous year: 9.71 percent).
2) The pre-tax interest rate relevant for BA Solutions is 9.21 percent (previous year: 8.67 percent).
3) The pre-tax interest rate relevant for Pavan is 10.69 percent.

The impairment tests confirmed the recoverability value of the two cash-generating units with goodwill:

- Business Area Equipment (excluding Pavan)
- Business Area Solutions

Even if the above-mentioned parameters were to change, neither of the two cash-generating units discussed in the previous passage would be impaired. As such, GEA was able to confirm the recoverability of the goodwill even on the basis of the latest capital market parameters as of December 31, 2019.

The special impairment test conducted for Pavan for the first time in 2019 was necessary on account of the change in the way the business activities of this unit are monitored. Please refer to the disclosures on page 190 of section 2.1. Description of accounting policies.

The goodwill of EUR 247.6 million identified during the impairment test for the Pavan unit was fully written down. The recoverable amount of EUR 103.5 million is the fair value of Pavan less costs of disposal, and corresponds to the unit's carrying amount after recognition of impairment losses. Based on the input factors of the discounted cash-flow procedure, the fair-value measurement was classified as "level 3 fair value" according to the IFRS 13 hierarchy, and carried out using the above-mentioned key assumptions.

After recognition of the impairment losses for Pavan, the recoverable amount of this unit corresponds to its carrying amount. As such, further impairment may arise should unfavorable trends have an adverse effect on any of the key assumptions. GEA was able to confirm the impairment losses identified on Pavan's goodwill even on the basis of the latest capital market parameters as of December 31, 2019.

5.4 Other intangible assets

The carrying amount of intangible assets changed as follows:

(EUR thousand)	Market-related intangible assets	Customer-related intangible assets	Contract-based intangible assets	Technology-based intangible assets	Internally generated intangible assets	Total
Jan. 1, 2018						
Cost	126,842	296,632	123,566	162,590	240,949	**950,579**
Cumulative amortization and impairment losses	–15,363	–138,512	–89,688	–81,087	–97,777	**–422,427**
Carrying amount	**111,479**	**158,120**	**33,878**	**81,503**	**143,172**	**528,152**
Changes in 2018						
Additions	–	–	5,391	3,252	41,156	**49,799**
Disposals	–	–	–13	–129	–489	**–631**
Amortization	–946	–35,961	–11,017	–10,869	–25,859	**–84,652**
Impairment losses	–5,674	–8,977	–4,485	–2,367	–3,058	**–24,561**
Changes in consolidated group and business combinations	1,701	3,750	66	1,361	–	**6,878**
Currency translation	105	–72	7	194	37	**271**
Other changes	–	–	753	583	6,080	**7,416**
Carrying amount at Dec. 31, 2018	**106,665**	**116,860**	**24,580**	**73,528**	**161,039**	**482,672**
Jan. 1, 2019						
Cost	128,691	299,897	124,500	166,760	286,902	**1,006,750**
Cumulative amortization and impairment losses	–22,026	–183,037	–99,920	–93,232	–125,863	**–524,078**
Carrying amount	**106,665**	**116,860**	**24,580**	**73,528**	**161,039**	**482,672**
Changes in 2019						
Additions	–	–	6,086	5,567	39,294	**50,947**
Disposals	–	–	–13	–34	–208	**–255**
Amortization	–944	–21,315	–10,503	–10,710	–33,155	**–76,627**
Impairment losses	–8,304	–334	–20	–3,744	–19,630	**–32,032**
Changes in consolidated group and business combinations	–	–	–	6	–	**6**
Currency translation	863	204	96	418	75	**1,656**
Other changes	–	–	272	1,120	1,563	**2,955**
Carrying amount at Dec. 31, 2019	**98,280**	**95,415**	**20,498**	**66,151**	**148,978**	**429,322**
Dec. 31, 2019						
Cost	120,729	288,080	128,857	168,724	321,092	**1,027,482**
Cumulative amortization and impairment losses	–22,449	–192,665	–108,359	–102,573	–172,114	**–598,160**
Carrying amount	**98,280**	**95,415**	**20,498**	**66,151**	**148,978**	**429,322**

The additions to internally generated intangible assets are primarily attributable to the Business Area Equipment and to the Global Corporate Center. In the former, costs relating to developments in automated milking, in particular, were capitalized. The additions in the Global Corporate Center are largely the result of the Customer Relationship Management System (OneGEA CRM) launched in mid-2017, the Concur project (travel expense accounting tool), and of capitalized expenses in connection with the "One ERP" project.

In 2019, expenditure on research and development amounted to EUR 127,854 thousand (previous year: EUR 119,889 thousand). These figures include refunded expenses totaling EUR 16,794 thousand (previous year: EUR 18,151 thousand) that are recorded in the cost of sales. Please see the section "Research and Development" in the consolidated financial statements for more information.

The impairment on market-related intangible assets of EUR 8,304 thousand is fully attributable to brands with an indeterminate useful life and is explained in more detail later on in this section.

The impairment on internally generated intangible assets resulted from write-downs on internally generated technologies and internally generated software.

Intangible assets with finite useful lives are amortized on a straight-line basis using the following useful lives:

	Useful life in years
Market-related intangible assets	2 to 20
Customer-related intangible assets	2 to 15
Contract-based intangible assets	2 to 20
Technology-based intangible assets	2 to 25
Internally generated intangible assets	2 bis 10

Amortization of intangible assets in the amount of EUR 76,627 thousand in fiscal year 2019 (previous year: EUR 84,652 thousand) is reported in cost of sales and, where this relates to discontinued operations, in profit or loss from discontinued operations.

An indefinite useful life is assumed for market-related intangible assets of EUR 87,646 thousand (previous year: EUR 95,244 thousand). These assets are company and product names of the acquired companies. These are established brands in their respective sectors and will continue to be used indefinitely after the company in question has been acquired, which is why there are no indications of a limited useful life.

The carrying amount of intangible assets with indefinite useful lives is broken down as follows:

	12/31/2019		12/31/2018	
Segment	Carrying amount (EUR thousand)	Proportion of total carrying amount (%)	Carrying amount (EUR thousand)	Proportion of total carrying amount (%)
BA Equipment	36,746	41.9	39,259	41.2
BA Solutions	50,900	58.1	55,985	58.8
Total	**87,646**	**100.0**	**95,244**	**100.0**

These brands are tested for impairment at least once a year. For this purpose, as of this year, the value in use is initially verified on the basis of the recoverable amount of the cash-generating unit to which the brand belongs. With regard to the procedure and key assumptions for determining the value in use, reference is made to the assumptions on goodwill impairment testing (see section 5.3).

If the value in use of the cash-generating unit is less than its carrying amount, the brand is tested for impairment on the basis of its fair value less costs of disposal (Fair Value Hierarchy Level 3) using the relief from royalty method. Under this approach, the value of a brand is calculated on the basis of the future royalties that GEA would have to pay if it had to license the brands from third parties. The brand-related revenue is multiplied by the estimated license fee installments. The brand-related revenue is derived from the medium-term planning prepared by the Executive Board. The Supervisory Board has taken note of the corresponding plans. The assumed license fee installments are derived from the information available. The savings calculated in this way are then discounted using a brand-specific after-tax discount rate.

Measurement of the value in use and of the fair value less costs of disposal is based on the following assumptions:

(%)	10/31/2019	10/31/2018
Discount rate	6,08 - 8,45	6,48 - 8,30
Royalty rate	0,20 - 1,00	0,50 - 3,00

In the current business year, the brand-specific discount rates (before tax) used were between 7.36 and 11.09 percent. The impairment test performed at the end of the year produced a writedown of EUR 2,862 thousand (previous year: EUR 5,674 thousand) attributable to the Business Area Equipment. Also, during the year, an impairment loss of EUR 5,442 thousand was recognized on a brand whose cash-generating unit had been disposed of. This impairment loss was recognized in the Business Area Solutions.

5.5 Equity-accounted investments

The relevant figures for equity-accounted investments are based on the most recently available annual financial statements.

The respective carrying amounts and the share of the profit of equity-accounted investments are insignificant in relation to the group’s total assets and profit.

Associates

As of December 31, 2019, equity-accounted associates are reported at a carrying amount of EUR 72 thousand (previous year: EUR 70 thousand).

The share of the profit or loss of equity-accounted associated companies is as follows:

(EUR thousand)	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
Profit/loss from continuing operations	–32	16
Total profit/loss	**–32**	**16**

Joint ventures

As of December 31, 2019, equity-accounted joint ventures are reported at a carrying amount of EUR 5,600 thousand (previous year: EUR 11,813 thousand).

The share of the profit or loss of equity-accounted joint ventures is as follows:

(EUR thousand)	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
Profit/loss from coninuing operations	860	1,675
Total profit/loss	**860**	**1,675**

5.6 Other financial assets

Other financial assets are composed of the following items:

(EUR thousand)	12/31/2019	12/31/2018
Investments in unconsolidated subsidiaries and other equity investments	31,468	20,618
Other securities	8,963	8,146
Derivative financial instruments	156	46
Miscellaneous other financial assets	6,598	9,473
Other noncurrent financial assets	**47,185**	**38,283**
Derivative financial instruments	3,700	4,456
Miscellaneous other financial assets	183,423	179,512
Other current financial assets	**187,123**	**183,968**
Total	**234,308**	**222,251**

Investmets in unconsolidated subsidiaries and other equity investments

The increase in investments in unconsolidated subsidiaries results from the acquisition of all shares in a subsidiary previously measured using the equity method.

Derivative financial instruments

Derivative financial instruments are explained in section 6.9.

Miscellaneous other financial assets

Miscellaneous other financial assets with a carrying amount of EUR 190,021 thousand (previous year: EUR 188,985 thousand) were recognized as of the reporting date. They are broken down into noncurrent and current assets as follows:

(EUR thousand)	12/31/2019	12/31/2018
Other receivables from equity investments	409	700
Receivables from tax authorities	209	424
Sundry miscellaneous other financial assets	5,980	8,349
Miscellaneous other noncurrent financial assets	**6,598**	**9,473**
Other receivables from unconsolidated subsidiaries	2,921	4,838
Other receivables from equity investments	5,531	8,110
Other receivables from tax authorities	71,456	61,903
Sundry miscellaneous other financial assets	103,515	104,661
Miscellaneous other current financial assets	**183,423**	**179,512**
Total	**190,021**	**188,985**

Other receivables from tax authorities primarily comprise VAT receivables.

Miscellaneous other financial assets include prepaid expenses totaling EUR 35,138 thousand (previous year: EUR 31,191 thousand).

Information on credit risks in connection with other financial assets can be found in section 3.

5.7 Inventories

Inventories are composed of the following items:

(EUR thousand)	12/31/2019	12/31/2018
Raw materials, consumables, and supplies	148,567	172,861
Work in progress	170,242	168,631
Assets for third parties under construction	17,494	14,799
Finished goods and merchandise	320,865	312,022
Advance payments	83,945	72,383
Cost to obtain a contract	87	648
Total	**741,200**	**741,344**

Inventories of EUR 3,135 million were recognized as an expense in fiscal year 2019 (previous year: EUR 3,089 million). Impairment losses on inventories were EUR 21,696 thousand in the reporting period (previous year: EUR 17,822 thousand). In the current reporting period, prior-year impairment losses on inventories amounting to EUR 982 thousand (previous year: EUR 3,496 thousand) were reversed due to changes in estimates. The reversals were recognized in cost of sales. The incremental costs of obtaining a contract included in the cost of sales amounted to EUR 160 thousand in the year under review (previous year: EUR 216 thousand).

5.8 Contract assets

The contract assets are composed of the following items:

(EUR thousand)	12/31/2019	12/31/2018
Capitalized production cost of construction contracts	2,909,027	3,046,108
plus net gain from construction contracts	520,710	547,497
plus capitalized borrowing costs allocated to construction contracts	–	620
less progress billings	–3,313,700	–3,417,588
less advance payments received and invoiced on construction contracts	–110,342	–119,070
less impairment	–5,240	–1,648
Reclassification credit balance	412,583	406,868
Total contract assets	**413,038**	**462,787**

In the reporting year, impairment losses of EUR 3,827 thousand (previous year: EUR 1,537 thousand) were recognized for contract assets. In the current reporting period, impairments on contract assets amounting to EUR 12 thousand (previous year: EUR 13 thousand) were reversed.

Please see section 7.1 for a more extensive description of the contract assets.

5.9 Trade receivables

Trade receivables are composed of the following items:

(EUR thousand)	12/31/2019	12/31/2018
Trade receivables from third parties	898,782	897,420
Trade receivables from unconsolidated subsidiaries and other equity investments	16,296	26,464
Total	**915,078**	**923,884**

Trade receivables include receivables of EUR 13,790 thousand (previous year: EUR 15,579 thousand) that will not be realized until more than one year after the reporting date. Impairments on trade receivables totaled EUR 70,006 thousand (previous year: EUR 64,776 thousand).

5.10 Income tax receivables

At the reporting date, income tax receivables amounted to EUR 32,779 thousand (previous year: EUR 40,214 thousand). As in the previous year, the full amount is due within one year.

5.11 Cash and cash equivalents

Cash and cash equivalents were composed of the following items at the reporting date:

(EUR thousand)	12/31/2019	12/31/2018
Unrestricted cash	354,179	247,475
Restricted Cash	380	425
Total	**354,559**	**247,900**

Cash and cash equivalents comprise cash funds and overnight deposits. Restricted cash mainly consists of bank deposits.

During the year, the standard market interest rate for short-term bank deposits in the eurozone was 0.0 percent (previous year: 0.0 percent). The average interest rate at the end of the year was 0.0 percent, the same as in the previous year.

5.12 Assets held for sale

Assets held for sale are reported at a carrying amount of EUR 158 thousand (previous year: EUR 3,700 thousand) as of December 31, 2019. In the previous year, these assets were the associated company Merton Wohnprojekt GmbH and a property in Canada, both of which belonged to the Global Corporate Center. Plans to sell Merton were withdrawn, while the property in Canada was sold in 2019.

6. Consolidated Balance Sheet Disclosures: Equity and Liabilities

6.1 Equity

Subscribed capital

The subscribed capital of GEA Group Aktiengesellschaft as of December 31, 2019, was EUR 520,376 thousand (previous year: EUR 520,376 thousand). The shares are bearer shares and are divided into 180,492,172 (previous year: 180,492,172) no-par value shares. All the shares are fully paid up.

As in the previous year, the shares have a notional value (rounded) of EUR 2.88 each (previous year: EUR 2.88).

All shares convey the same rights. Shareholders are entitled to receive dividends as declared and are entitled to one vote per share at the Annual General Meeting. Treasury shares held by the company on the day of the Annual General Meeting do not carry voting rights and are not eligible for dividends.

Authorized capital

(EUR thousand)	Annual General Meeting resolution	Expiring on	Amount (EUR thousand)
Authorized Capital I	April 20, 2017	April 19, 2022	77,000
Authorized Capital II	April 16, 2015	April 15, 2020	130,000
Authorized Capital III	April 16, 2015	April 15, 2020	52,000
Total			**259,000**

In the case of the **Authorized Capital I** and in accordance with Article 4(3) of the Articles of Association, the Executive Board is authorized, with the approval of the Supervisory Board, to increase the share capital by up to EUR 77 million by issuing new no-par value shares against cash contributions until April 19, 2022 (Authorized Capital I) and, in accordance with Article 5(4) of the Articles of Association, to define a starting date for profit rights in this case that differs from the date stipulated by law. The authorization may be exercised fully or in partial amounts, on one or several occasions. Shareholders are generally entitled to subscribe to the new shares. The statutory subscription right may also be granted by the new shares being underwritten by one or more banks with the obligation of offering them to the shareholders for subscription (indirect subscription right). The Executive Board is authorized, with the approval of the Supervisory Board, to disapply shareholders' preemptive rights (i) insofar as this is necessary to eliminate fractional amounts, and/or (ii) in order to grant the creditors of convertible or option bonds with option or conversion privileges or obligations issued by GEA Group Aktiengesellschaft or a subordinate group company of the Company a right to subscribe to new shares to the extent to which they would be entitled after exercising the option or conversion rights or after fulfilling conversion obligations. Furthermore, the Executive Board is authorized, with the approval of the Supervisory Board, to stipulate the further details of capital increases from Authorized Capital I and the terms and conditions of the share issue.

In the case of the **Authorized Capital II** and in accordance with Article 4(4) of the Articles of Association, the Executive Board is authorized, with the approval of the Supervisory Board, to increase the share capital, wholly or in part, by up to EUR 130 million by issuing new no-par value shares against cash and/or non-cash contributions on one or more occasions until April 15, 2020 (Authorized Capital II), and, in accordance with Article 5(4) of the Articles of Association, to define a starting date for profit rights in this case that differs from the date stipulated by law. The statutory subscription right may also be granted by the new shares being underwritten by one or more banks with the obligation of offering them to the shareholders for subscription (indirect subscription right). Furthermore, the Executive Board is authorized, with the approval of the Supervisory Board, to disapply shareholders' preemptive rights in the case of capital increases against noncash contributions for the purpose of business combinations or the acquisition of companies, parts of companies, or equity interests in companies or other assets. The Executive Board is further authorized, with the approval of the Supervisory Board, to disapply shareholders' preemptive rights (i) in order to implement a so-called scrip dividend where the shareholders of GEA Group Aktiengesellschaft are given the option of contributing their dividend entitlement either wholly or partially to the company as a noncash contribution in return for the granting of new shares, (ii) insofar as it is necessary to eliminate fractional amounts, and (iii) in order to grant the creditors of convertible or option bonds with option or conversion privileges or obligations issued by GEA Group Aktiengesellschaft or a subordinate group company of the company a right to subscribe to new shares to the extent to which they would be entitled after exercising the option or conversion rights or after fulfilling conversion obligations. The total proportionate amount of GEA Group Aktiengesellschaft's share capital allocable to shares issued against cash and/or noncash contributions under disapplication of shareholders' preemptive rights must not exceed 10 percent of the company's share capital at the time when the resolution was adopted by the Annual General Meeting. Finally, the Executive Board is authorized, with the approval of the Supervisory Board, to stipulate the further details of the capital increases from Authorized Capital II and the terms and conditions of the share issue.

In the case of the **Authorized Capital III** and in accordance with Article 4(5) of the Articles of Association, the Executive Board is authorized, with the approval of the Supervisory Board, to increase the share capital by up to EUR 52 million by issuing new no-par value shares against cash contributions on one or more occasions until April 15, 2020 (Authorized Capital III) and, in accordance with Article 5(4) of the Articles of Association, to define a starting date for profit rights in this case that differs from the date stipulated by law. The statutory subscription right may also be granted by the new shares being underwritten by one or more banks with the obligation of offering them to the shareholders for subscription (indirect subscription right). The Executive Board is authorized, with the approval of the Supervisory Board, to exclude shareholders' subscription rights if the issue price of the new shares is not significantly lower than the stock exchange price for company shares of the same kind at the time of setting the issue price. In line with the modalities of this disapplication of preemptive rights, the shares issued in accordance with section 203(1) and section 186(3) no. 4 of the AktG (German Stock Corporation Act) may not exceed 10% of the share capital of the Company either at the time at which this authorization takes effect or at the time at which it is exercised (upper limit). The upper limit of 10 percent shall be reduced by the proportionate amount of the share capital allocable to shares (i) issued during the term of the Authorized Capital III under disapplication of preemptive rights in accordance with section 71(1) no. 8 sentence 5, and Section 186(3) sentence 4 of the AktG (German Stock Corporation Act) or (ii) issued to service convertible or option bonds with option or conversion privileges or obligations issued by GEA Group Aktiengesellschaft or a subordinate group company of the company, as long as the convertible or option bonds have been issued during the term of the Authorized Capital III under disapplication of preemptive rights in accordance with section 186(3) sentence of the 4 AktG. The Executive Board is further authorized, with the approval of the Supervisory Board, to disapply shareholders' preemptive rights (i) insofar as it is necessary to eliminate fractional amounts, and (ii) in order to grant the creditors of convertible or option bonds with option or conversion privileges or obligations issued by GEA Group Aktiengesellschaft or a subordinate group company of the Company a right to subscribe to new shares to the extent to which they would be entitled after exercising the option or conversion rights or after fulfilling conversion obligations. Finally, the Executive Board is authorized, with the approval of the Supervisory Board, to stipulate the further details of the capital increases from Authorized Capital III and the terms and conditions of the share issue.

Contingent capital

(EUR thousand)	12/31/2019	12/31/2018
Bonds with warrants and convertible bonds according Annual General Meeting resolution 16. April 2015	51,904	51,904
Total	**51,904**	**51,904**

Under a resolution adopted by the Annual General Meeting on April 16, 2015, the share capital was contingently increased by up to EUR 51,903,633.82, comprising up to 19,200,000 bearer shares (Article 4(6) of the Articles of Association, Contingent Capital 2015). The contingent capital increase will only be implemented to the extent that the holders of conversion or option privileges from convertible bonds or option bonds, profit participation rights or profit participating bonds or a combination of these instruments issued against cash contributions by GEA Group Aktiengesellschaft or a subordinate group company of the Company on the basis of the authorization by the Annual General Meeting resolution dated April 16, 2015 exercise their conversion or option privileges, or, if they are obliged to convert or exercise options, satisfy their obligation to convert or exercise options, and if no cash settlement is granted or own shares or shares of another listed company are used in settlement. New shares will be issued at the conversion or option price to be determined in each case in accordance with the authorizing resolution referred to above. The new shares bear dividend rights from the beginning of the fiscal year in which they were created as a result of the exercising of conversion or option privileges or the fulfillment of conversion or option obligations. The Executive Board is authorized, with the approval of the Supervisory Board, to determine the further details of the implementation of the contingent capital increase.

As in the previous year, no bonds with warrants or convertible bonds were issued in fiscal year 2019.

Capital reserves

Capital reserves primarily reflect the effects from the business combination of the former Metallgesellschaft Aktiengesellschaft and the former GEA AG as well as premiums from issuing shares of the former Metallgesellschaft AG.

Capital reserves were unchanged compared with the previous year at EUR 1,217,861 thousand.

Retained earnings

The changes in retained earnings and net retained profits are reported in the statement of changes in equity. Actuarial gains and losses on the measurement of noncurrent employee benefit obligations are included in retained earnings.

The distribution of profits is based on the annual financial statements of GEA Group Aktiengesellschaft prepared in accordance with the HGB.

Accumulated other comprehensive income

Changes in equity outside profit or loss are reported in accumulated other comprehensive income if they do not relate to capital transactions with shareholders. Other comprehensive income comprises the gains or losses on financial assets measured at fair value and recognized directly in equity, the effective portion of the change in fair value of derivatives designated as cash flow hedges, and exchange rate gains or losses from the translation of the financial statements of foreign subsidiaries.

Noncontrolling interests

Noncontrolling interests in GEA companies amounted to EUR 421 thousand (previous year: EUR 568 thousand). The change was largely the result of an impairment loss recognized within Pelacci S.R.L. i.L., in which GEA Procomac S.p.A. holds a 67% stake.

6.2 Provisions

The following table shows the composition of and changes in provisions in 2019:

(EUR thousand)	Guarantees, warranties	Financial guarantee contracts	Litigation risks	Follow-up costs	Environ-mental protection, mining	Impending Losses	Other provisions	Provisions
Balance at Jan. 1, 2019	**59,027**	**2,798**	**13,052**	**27,391**	**109,549**	**35,648**	**70,540**	**318,005**
thereof non-current	6,329	–	8,495	3,354	109,483	398	29,176	**157,235**
thereof current	52,698	2,798	4,557	24,037	66	35,250	41,364	**160,770**
Additions	38,368	–	9,943	34,776	7,161	6,812	60,149	**157,209**
Utilization	–23,293	–175	–11,256	–10,853	–2,012	–33,335	–37,966	**–118,890**
Reversal	–6,475	–	–239	–5,245	–139	–54	–12,980	**–25,132**
Changes in consolidated group	–75	–	–	–285	–	–107	1,363	**896**
Compounding and change in interest rate	1	–	–	–	–30,740	–	–	**–30,739**
Exchange differences	828	–	–26	84	3	108	194	**1,191**
Balance at Dec. 31, 2019	**68,381**	**2,623**	**11,474**	**45,868**	**83,822**	**9,072**	**81,300**	**302,540**
thereof non-current	7,519	–	5,518	2,043	83,754	1,610	24,212	**124,656**
thereof current	60,862	2,623	5,956	43,825	68	7,462	57,088	**177,884**

Provisions for guarantees and warranties

Provisions for guarantees and warranties relate to warranty commitments for products and equipment. As is customary in the industry, the guarantees and warranties on which they are based are granted in connection with certain performance criteria relating to products or equipment (e.g., guaranteed output volume, quality of product manufactured). Warranties usually have a contractual term of between one and two years from the date on which the products or equipment are accepted. In addition to warranties explicitly agreed under contract, product liability rules apply in many sales countries and may also stipulate that the manufacturer is liable beyond the contractually defined term of the warranty. In some cases, recourse claims exist in the form of insurance refunds or subcontractor guarantees. The level of provisions is based on management's best estimate. GEA expects to settle most of the provisions for guarantees and warranties in the coming year.

Provisions for financial guarantee contracts

Provisions for financial guarantee contracts comprise obligations under indemnification agreements as well as warranties and undertakings relating to the sale of business activities. The changes in these provisions in fiscal year 2019 are due to utilization.

Litigation risks

Provisions are recognized for risks arising from expected or pending litigation against GEA companies if it is believed that there is likely to be an unfavorable outcome to the proceedings. Assessments by counsel for the Company or legal experts were used to determine the likelihood of such litigation. The probable obligations related to damages or sanctions have been recognized as provisions. The timing of cash outflows relating to provisions for litigation risks often cannot be reliably determined.

Follow-up costs

This item comprises the cost of residual work that is incurred after a contract has already been invoiced and the profit from the contract has been recognized. The amount of the expected cost is stated. Payments are made almost in their entirety in the following year.

Environmental protection, mining

This item mainly comprises provisions for the clean-up of pit water from past mining activities and for the clean-up of other instances of groundwater contamination. The amount and duration of the company's obligation to clean up pit and ground water has not been legally clarified yet. The obligations are expected to extend to well beyond 2035.

In fiscal year 2019, the method of deriving the rate of interest to be used for measurement was modified. The estimate was modified mainly as a consequence of a reassessment of long-term interest levels.

Thus, as of December 31, 2019, this provision was EUR 25.8 million lower than it was on December 31, 2018. This trend is largely the result of a change in the way the applicable rate of interest is derived, and it gave rise to interest income of EUR 32.7 million. Of this amount, EUR 11.5 million was attributable to earnings from continuing operations, while EUR 21.2 million affected earnings from discontinued operations. Compared with the prior method of interest derivation, the change in estimate produced a EUR 148.1 million increase in the profit for the period in 2019, EUR 37.1 million of which was attributable to earnings from continuing operations and EUR 111.0 million to earnings from discontinued operations.

The above-mentioned provisions are expected to produce average annual cash outflows of EUR 1.1 million between 2020 and 2022.

Provisions for impending losses

This item mainly comprises impending losses resulting from customer contracts for which revenue is recognized over time pursuant to IFRS 15. As soon as an impending loss becomes known, its expected amount is reported immediately.

Other provisions

Other provisions comprise provisions for a range of individual items. As of December 31, 2019, other provisions included provisions for restructuring measures within the meaning of IAS 37 of EUR 4.1 million (previous year: EUR 0 million).

6.3 Employee benefit obligations

Employee benefit obligations comprise the following items:

(EUR thousand)	Section	12/31/2019	12/31/2018
Obligations under pension plans and supplementary healthcare benefits		837,295	766,213
thereof defined benefit pension plans	6.3.1	822,574	751,824
thereof obligations under supplementary healthcare benefits	6.3.1	14,578	14,320
thereof defined contribution pension plans	6.3.2	143	69
Other employee benefit obligations		2,380	3,056
Partial retirement		9,439	10,345
Jubilee benefits		10,414	9,360
Redundancy plan and severance payments		505	607
Other non-current obligations to employees		6,167	1,681
Non-current employee benefit obligations		**866,200**	**791,262**
Redundancy plan and severance payments		48,315	8,985
Outstanding vacation, flexitime/overtime credits		63,778	60,549
Bonuses		105,899	77,284
Other current obligations to employees		17,222	17,427
Current employee benefit obligations		**235,214**	**164,245**
Total employee benefit obligations		**1,101,414**	**955,507**

The rise in current employee benefit obligations was largely due to restructuring measures within the meaning of IAS 37. As of December 31, 2019, provisions amounting to EUR 44,283 thousand (previous year: EUR 3,926 thousand) had been established for severance payments in connection with these restructuring measures, EUR 44,023 thousand of which are be reported in current employee benefit obligations. The calculation of the provision is based on findings from comparable restructuring measures in the past.

6.3.1 Obligations under defined benefit pension plans and supplementary healthcare benefits

Wherever possible, defined benefit pension obligations and obligations under supplementary healthcare benefits are disclosed below in the aggregate and explained together.

All obligations were actuarially valued as of December 31, 2019, and as of December 31, 2018.

Defined benefit pension plans

GEA employees are offered various benefit options, mainly in the form of defined benefit and defined contribution pension plans.

Defined benefit pension plan obligations exist in Germany and, outside of Germany, mainly in the U.S.A. and the United Kingdom. In addition, other foreign companies have typical country-specific pension plans that are funded in part by plan assets. Benefits and investments correspond to the country-specific economic environment and requirements.

GEA views granting pension benefits as an opportunity to foster employee loyalty and engagement. It is therefore a standard feature of the remuneration concept and has an employee contribution component, where this is appropriate. In connection with this, GEA monitors developments on the human resources market and regularly checks that the benefits it grants are appropriate and in line with the market.

GEA does not believe that the pension obligations pose any risks over and above the customary extent and the general risks described.

Pension benefits in Germany

In Germany, GEA grants old-age, disability, and survivors' benefits to many of its employees. New employees are generally only granted benefits that are partly funded by employee contributions.

As part of the general benefits provided, all employees have the opportunity to voluntarily defer part of their compensation. Under this arrangement, an agreed amount of their salary plus an employer contribution of up to 100 percent of the deferred amount is converted into a pension benefit. A corresponding collective bargaining agreement was entered into in 2002 and revised in 2008. In this case, the post-retirement benefits are adjusted by 1 percent each year.

According to GEA's new executive pension scheme, executives are granted benefits in the form of an asset-backed defined benefit plan. The plan assets are managed under a Contractual Trust Arrangement (CTA) and invested in mixed funds. The size of the employer's contributions to the plan assets depends on the size of the fixed salaries of the beneficiaries. Beneficiaries can also contribute from their own income by means of deferred compensation. The beneficiaries are then entitled to the net earnings generated by the plan assets. There is also a notional premium guarantee.

In addition to the currently open benefit plans, there are a number of historical pension plans in the company. These plans are generally closed to new employees, but are maintained unchanged for employees who were members at the time the plan was closed. These include obligations under "Bochumer Verband" and "Essener Verband" as well as obligations established independently by their predecessors. Entitlements also exist from the earlier executive pension scheme, which has been closed to new members since the end of the fiscal year 2014. Post-retirement benefits from the earlier executive pension scheme are adjusted by 1 percent each year.

The pension obligations are partly funded by pension liability insurances.

Pension benefits outside Germany

Pension benefits outside Germany mainly exist in the U.S. and the United Kingdom.

In the U.S. there are pension obligations from various pension plans that were closed in succession up to December 31, 2000. No further benefits are earned from a defined benefit pension plan for periods of service after the respective closure date. Old-age and survivors' benefits accrued at the closure date of the respective plan were fixed on the basis of pensionable income at the closure date. Benefits may be paid out in the form of annuities or lump-sum payments. Existing pension obligations are partly funded by plan assets. The assets are held separately from the company in an external trust. The companies have appointed independent trustees in accordance with statutory provisions to manage the funding of obligations and the investment of assets according to the company's specifications. Any funding deficit is established annually in accordance with legal requirements and spread over a fixed time period if required. The statutory basis for minimum funding was last amended in 2012 by the Moving Ahead for Progress in the 21st Century Act (MAP–21).

In the United Kingdom, there are pension obligations from two UK pension plans, one of which has been closed for a number of years and applies exclusively to former employees. The second plan is closed to new employees, but continues to provide old-age and survivors' benefits to the currently active participants based on pensionable income in the year before the employment relationship ends; these benefits are funded by salary-dependent employee contributions to plan assets. The accrued entitlements and current benefits in the United Kingdom are adjusted in accordance with statutory requirements on the basis of inflation. Pension obligations from both plans are partly funded by plan assets. The companies appointed independent trustees in accordance with statutory provisions to manage the funding of obligations and the investment of assets according to the company's specifications. Company pension plans are valued every three years in accordance with legal requirements, and any deficit is established. If the plan is underfunded, the trustee prepares a funding plan to regulate the funding of the deficit, taking account of the actuary's recommendation and the type and circumstances of the respective plan.

Supplementary healthcare benefits

In addition to occupational pension benefits, certain retired employees are granted health insurance subsidies. New entitlements to health insurance subsidies are no longer granted in Germany. There are now only a few employees with such benefits in active employment. Existing obligations from supplementary healthcare plans are not funded by plan assets. GEA does not see these benefits posing a particular risk due to the low level of the obligations.

Obligations under supplementary healthcare benefits relate mainly to Germany.

Provisions and funded status

The changes in the present value of the defined benefit obligation, the plan assets, and the provisions were as follows:

	12/31/2019		12/31/2018	
(EUR thousand)	Germany	Other countries	Germany	Other countries
Present value of defined benefit obligation at beginning of fiscal year	**744,852**	**149,517**	**732,799**	**155,673**
Current service cost	11,865	2,550	10,965	2,888
Interest Cost from discounting unwinding on obligations	12,380	4,191	12,064	3,978
Employee contributions	–	418	–	407
Remeasurement of present value of obligation	77,304	14,674	20,203	–6,656
Actuarial gains/ losses from changes in demographic assumptions	–	–662	5,271	–1,226
Actuarial gains/ losses resulting from changes in financial assumptions	77,531	15,071	6,728	–6,028
Actuarial gains/ losses resulting from experience adjustments	–227	265	8,204	598
Past service cost	–	–73	–	562
Gains and losses from settlements	–28	–1,389	–	–
Payments without settlements	–30,428	–9,338	–31,179	–9,875
Payments in respect of any settlements	–155	–10,663	–	–
Changes in combined group due to acquisitions	–	–	–	–970
Other changes in combined group	–	808	–	502
Currency translation	–	3,248	–	3,008
Present value of defined benefit obligation at end of fiscal year	**815,790**	**153,943**	**744,852**	**149,517**
Fair value of plan assets at beginning of the fiscal year	**36,053**	**93,479**	**31,258**	**96,113**
Interest income on plan assets	644	2,614	416	2,506
Employer contributions	5,223	4,375	5,077	4,617
Employee contributions	–	418	–	407
Remeasurement: return from plan assets in excess/ shortage of interest income	1,495	6,938	176	–3,730
Payments without settlements	–837	–7,787	–874	–8,403
Payments in respect of any settlements	–155	–10,663	–	–
Currency translation	–	2,380	–	1,969
Fair value of plan assets at the end of fiscal year	**42,423**	**91,754**	**36,053**	**93,479**
Net carrying amount	**773,367**	**62,189**	**708,799**	**56,038**
thereof net asset	–	1,603	–	1,314
thereof net liability	773,367	63,792	708,799	57,352

The net carrying amount of obligations under defined benefit pension plans and supplementary healthcare benefits changed as follows in fiscal years 2019 and 2018:

	12/31/2019		12/31/2018	
(EUR thousand)	Germany	Other countries	Germany	Other countries
Net carrying amount at beginning of fiscal year	**708,799**	**56,038**	**701,541**	**59,560**
Changes through profit or loss	23,573	2,665	22,613	4,922
Current service cost	11,865	2,550	10,965	2,888
Past service cost	–	–73	–	562
Gains and losses on settlements	–28	–1,389	–	–
Net interest on net defined benefit liability	11,736	1,577	11,648	1,472
Changes through OCI	75,809	7,736	20,027	–2,926
Return from plan assets in excess interest income	–1,495	–6,938	–176	3,730
Actuarial gains/ losses from changes in demographic assumptions	–	–662	5,271	–1,226
Actuarial gains/ losses resulting from changes in financial assumptions	77,531	15,071	6,728	–6,028
Actuarial gains/ losses resulting from experience adjustments	–227	265	8,204	598
Cash-effective changes	–34,814	–5,926	–35,382	–6,089
Employer contributions	–5,223	–4,375	–5,077	–4,617
Payments without settlements	–29,591	–1,551	–30,305	–1,472
Other changes	–	1,676	–	571
Changes in combined group due to acquisitions	–	–	–	–970
Other changes in combined group	–	808	–	502
Currency translation	–	868	–	1,039
Funded status/ Net carrying amount	**773,367**	**62,189**	**708,799**	**56,038**

The following overview shows the net carrying amount broken down into plans with and without plan assets:

	12/31/2019		12/31/2018	
(EUR thousand)	Germany	Other countries	Germany	Other countries
Present value of funded obligations	204,063	131,990	180,873	131,701
Fair value of plan assets	42,423	91,754	36,053	93,479
Funded status/ Net carrying amount of funded obligations	**161,640**	**40,236**	**144,820**	**38,222**
Present value of unfunded obligations	611,727	21,953	563,979	17,816
Funded status/ Net carrying amount of unfunded obligations	**611,727**	**21,953**	**563,979**	**17,816**
Funded status/ Net carrying amount	**773,367**	**62,189**	**708,799**	**56,038**

As in the previous year, no asset ceiling in accordance with IAS 19.64 (b) applies. In addition, there are no reimbursement claims within the meaning of IAS 19.116.

The following overview shows the present value of the defined benefit obligation broken down into active employees, former employees with terminated vested benefits, and benefit recipients:

	12/31/2019		12/31/2018	
(EUR thousand)	Germany	Other countries	Germany	Other countries
Active employees	273,825	65,219	232,205	66,977
Vested terminated employees	137,228	30,070	119,730	29,061
Pensioners	404,737	58,654	392,917	53,479
Total	**815,790**	**153,943**	**744,852**	**149,517**

Plan assets

The plan assets used to cover the pension obligations were as follows at the respective reporting dates:

	12/31/2019		12/31/2018	
(Percent)	Germany	Other countries	Germany	Other countries
Quoted prices in active marktes	38.1	86.1	28.3	75.8
Equity instruments	–	35.0	–	27.9
Debt instruments	38.1	44.9	28.3	41.6
Other	–	6.2	–	6.3
No quoted prices in active marktes	61.9	13.9	71.7	24.2
Equity instruments	–	1.1	–	0.9
Debt instruments	–	0.8	1.3	0.7
Real estate	–	0.1	–	0.1
Insurance	60.3	11.8	68.3	22.4
Other	1.6	0.1	2.1	0.1
Total	**100.0**	**100.0**	**100.0**	**100.0**

Particularly in Germany, GEA has decided to utilize the internal financing effect of the pension provisions and supplementary healthcare benefits and only to fund a relatively small proportion of the pension obligations using plan assets.

In the U.S. and the United Kingdom, a large proportion of the pension obligations is funded by plan assets in accordance with the legal framework. The above table shows how the plan assets have been invested. A proportion of both the German and foreign plan assets is managed by insurance companies in accordance with their specific investment guidelines. In Germany, this is the predominant form of investment for plan assets. Part of the plan assets of German pension plans is also managed by pension funds and an endowment fund, and is mainly invested in fixed-income securities and term deposits, with only a relatively small proportion invested in equities. The objective of these external investments is to ensure secure returns and preserve the value of the underlying assets in order to fund current and future pension benefits. There are currently no plans to change this investment strategy.

Assets invested in the capital markets are exposed to general capital market and investment risk. GEA continually monitors market trends and has developed corresponding investment policies that adequately balance risk and income expectations, while taking the respective statutory and regulatory frameworks into account.

In fiscal year 2020, EUR 4,511 thousand is expected to be added to the plan assets of German pension plans and EUR 6,703 thousand to plans outside Germany.

The actual return on plan assets in 2019 was EUR 11,691 thousand (previous year: EUR –631 thousand).

Actuarial assumptions

As of the relevant reporting date, the following weighted actuarial assumptions were used to calculate the present value of the defined benefit obligations. These assumptions are used to calculate net pension expenses in the following year.

	12/31/2019		12/31/2018	
(Percent)	Germany	Other countries	Germany	Other countries
Discount factor	1.00	2.11	1.70	2.93
Inflation	1.70	1.19	1.80	1.26
derived: wage and salary growth rate	2.70	1.30	2.80	1.33
derived: pension growth rate	1.46	0.28	1.33	0.31
derived: growth rate in cost of health care benefits	3.45	6.92	3.55	7.12

The actuarial measurement factors for German plans are established by GEA in consultation with actuarial experts. The corresponding assumptions for plans outside Germany are determined taking into account country-specific conditions with the help of local experts in consultation with the global experts and GEA. The discount rate is established using a recognized method based on the return on high quality corporate bonds determined as of the reporting date, taking into account the currency and maturities of the underlying liabilities. For countries that do not have a liquid market in corporate bonds that are suitable for setting the discount rate, interest rates on government bonds are referred to instead to define the rate.

All other assumptions correspond to the long-term expectations of GEA. The nominal rate of wage and salary increases is calculated based on expected inflation and a real rate of increase. The rate of pension increases in Germany is also determined based on inflation, provided that the pension adjustments are determined in accordance with the rise in the cost of living. In addition, the financial position of the relevant company is also taken into account. If a firm pension adjustment commitment has been made, this is taken into account accordingly. Outside of Germany, the pension adjustment is also generally determined on the basis of inflation. The growth rate assumed for the costs of supplementary healthcare benefits in Germany equates to forecast inflation plus a growth rate based on historical data. Based on this data, the growth rate is not expected to change in the future.

Klaus Heubeck's 2018G mortality tables were used as a basis for measuring all German plans as of December 31, 2019. On this basis, the life expectancy of a 65-year-old pensioner as of the reporting date is 20.37 years for men and 23.85 years for women (previous year: 20.22 years/23.73 years). Country-specific measurement bases were used for pension liabilities outside Germany.

The sensitivities presented below apply to the discount rate and inflation, which have been identified as actuarial assumptions that have a significant influence on GEA's benefit obligations. Since the wage and salary increase rate, the pension increase rate and the growth rate in the cost of supplementary health benefits are derived from inflation, sensitivity to inflation was used to measure the sensitivity of these assumptions together. The same calculation methods were used for sensitivities as for the recognized provisions. The ranges used to compute the sensitivities of the assumptions are based on the changes that are deemed possible until the next reporting date, given historical experience. The meaningfulness of historical experience for forecasts of future outcomes and neglecting to update a number of assumptions simultaneously may represent limitations of these methods.

(EUR thousand)	12/31/2019	
Increase (+)/ Decrease (-) of DBO	Germany	Other countries
Increase of discount factor by 50 basis points	–61,778	–9,268
Decrease of inflation by 25 basis points	–18,213	–1,588

A one-year increase in life expectancy results in an increase of around 4.35 percent in the present value of the defined benefit obligations, on average.

Future cash flows

The following benefit payments are expected to be made under the German and foreign plans in the coming years:

(EUR thousand)	2020	2021	2022	2023	2024	2025 - 2029
German plans	33,434	33,137	33,018	32,645	33,145	167,165
Foreign plans	9,864	8,130	8,344	7,487	7,816	42,073

The average weighted duration of pension obligations and supplementary healthcare benefits is:

	12/31/2019		12/31/2018	
(Years)	Germany	Other countries	Germany	Other countries
Duration	16.0	12.8	15.0	13.3

6.3.2 Defined contribution pension plans

Various companies – especially in the U.S. and Scandinavia – operate defined contribution pension plans. Under these plans, the obligation does not lie with GEA, but with the respective pension funds. Contributions totaling EUR 22,984 thousand were made in fiscal year 2019 (previous year: EUR 15,450 thousand). Contributions of EUR 74,789 thousand were made to state pension insurance systems (previous year: EUR 59,382 thousand). These contributions are recognized as personnel expenses at the same time as the relevant service is rendered.

Two nationwide, joint pension plans operated by several employers in the Netherlands were recognized as defined contribution pension plans since the obligation on the part of the employers is limited to the payment of contributions, as set out in the terms and conditions of the pension plans. The employers are neither liable for any underfunding, nor do they participate in any plan overfunding.

The terms and conditions of both plans require a minimum funding level to be maintained. If this level is not met, a stabilization plan must be submitted to the Dutch Central Bank. Neither a surplus nor a deficit would result in additional payments from or into the plan for the participating companies. However, if the minimum funding level is not met, pension benefits may be reduced or future contributions payable by the participating companies may be increased.

The first mutual pension plan has around 600,000 beneficiaries, of whom around 400 belong to GEA. Contributions amounting to EUR 2,025 thousand (previous year: EUR 2,329 thousand) were made to this multi-employer pension plan in fiscal year 2019.

The second joint pension plan has around 1.2 million beneficiaries, of whom around 500 belong to GEA. Contributions amounting to EUR 3,508 thousand (previous year: EUR 3,217 thousand) were made to this plan in fiscal year 2019.

6.3.3 Share-based payment

Share-based payments in fiscal year 2019 for the group as a whole totaled EUR 4,034 thousand (previous year: EUR 484 thousand). The carrying amount of liabilities arising from share-based payment transactions in the group as a whole amounted to EUR 4,059 thousand as of December 31, 2019 (previous year: EUR 166 thousand).

Performance Share Program

Effective July 1, 2006, GEA Group Aktiengesellschaft launched a long-term remuneration program entitled “GEA Performance Share Program,” a cash-settled share-based payment plan for all first- and second-level managers below the Executive Board. Third-level managers were also eligible to participate starting with the third tranche of the program as of July 1, 2008. The goal of the GEA Performance Share Program is to link managers’ remuneration with the long-term success of the company and to align their interests with those of the shareholders.

Under the program, participants are granted a defined number of Performance Shares at the beginning of the performance period. The number of Performance Shares allotted is determined by the participants’ management level. To participate in the plan, managers must invest 20 percent of the amount of the allotted Performance Shares in shares of GEA Group Aktiengesellschaft. The personal investment must then be held for three years (performance period).

The performance of GEA Group Aktiengesellschaft’s shares relative to the companies included in a benchmark index over the three-year performance period is measured on the basis of their total shareholder return (TSR). The benchmark for the tranches issued since 2014 is the STOXX® Europe TMI Industrial Engineering (TMI IE). This change in the benchmark index has harmonized the plan with the share-based payments for Executive Board members. TSR is a suitable indicator for investors to compare the performance and appeal of different companies. It measures the total percentage return that an investor earns from a share over a certain period. In addition to share price performance, dividends and adjustments such as share splits are included in the calculation of TSR. This method of comparison eliminates share price performance that is due to general market volatility and enables the effects of different profit retention strategies to be compared. The relative performance of GEA Group Aktiengesellschaft's shares determines the number of Performance Shares finally paid out (between 0 percent and 300 percent).

The Performance Shares are paid out once the three-year performance period has expired. At that time, the performance of GEA Group Aktiengesellschaft's shares relative to the benchmark determines how many Performance Shares are paid out: If the performance of the company's shares equals the median in the TSR comparison, 50 percent of the Performance Shares are issued; if it reaches the third quartile, 100 percent of the Performance Shares are paid out. If GEA Group Aktiengesellschaft's shares outperform the benchmark index companies, 300 percent of the Performance Shares are issued. Other performance figures are interpolated between these values.

The total amount paid out corresponds to the number of Performance Shares allotted to a participant multiplied by the average share price over the last quarter of the three-year performance period. Once the performance period has expired, participants may freely dispose of their personal investment in GEA Group Aktiengesellschaft shares.

The last 2016 tranche expired on June 30, 2019. The TSR comparison over the three-year performance period resulted in a payout ratio of 0 percent (previous year: Tranche 2015 0 percent), meaning that there was a payment of EUR 0 thousand (previous year: EUR 0 thousand) in the year under review.

The number of Performance Shares changed as follows in fiscal year 2019:

(Number of shares)	12/31/2018	Additions	Expired	Paid Out	Changes in consolidated group	12/31/2019
2016 tranche	89,493	–	89,493	–	–	–
Total	**89,493**	**–**	**89,493**	**–**	**–**	**–**

Taking into account the fair value as of December 31, 2019, of EUR 0 thousand (previous year: EUR 0 thousand) for the 2016 tranche at the payment date, the group as a whole incurred no expenses in this regard in fiscal year 2019 (previous year: income of EUR 41 thousand).

	2019	2018	
Tranche	n/a	2016	2017
Share price (EUR)		23.55	
Dividend yield (%)		4.00	
Risk-free interest rate (%)		–0.800	
Volatility GEA shares (%)		34.71	

As the payout ratio of GEA Group Aktiengesellschaft's Performance Shares is linked to the MDAX or TMI IE, the volatilities of all MDAX or TMI IE shares and their correlations to GEA Group Aktiengesellschaft shares are also calculated. The calculation of volatilities and correlations is based on historical market data. Risk-free interest rates were determined from German government bond yields.

Long-term share price component

The long-term share price component was introduced as part of the revision of the variable remuneration system for Executive Board members in fiscal year 2012. The payout from the long-term share price component is measured over a three-year performance period that includes the relevant fiscal year and the two subsequent years.

Performance is measured by comparing the performance of the GEA share price, adjusted for dividends, with the performance of the STOXX® Europe TMI Industrial Engineering (TMI IE) index over a three-year performance period. This comparison is computed on the basis of the respective arithmetic mean closing prices on the last 20 trading days preceding the start of the three-year performance period. 100 percent of the target is achieved if the performance of the arithmetic mean of the GEA share daily closing prices is equal to 100 percent of the corresponding TMI performance over the three-year performance period. In the event of outperformance greater than 100 percent, the amount paid out rises to a maximum of 300 percent of the target amount. If the increase in GEA's share price over the three-year period is less than 100 percent of the growth in the TMI IE, the amount payable is reduced accordingly down to a performance level of 75 percent. The degree of target achievement increases or decreases by 4 percent for each percentage point greater than or less than a performance level of 100 percent. The total degree of target achievement and thus the payout level for the long-term share price component is limited to 300 percent of this target amount (cap).

Starting from a target amount of EUR 1,517 thousand (previous year: EUR 2,015 thousand), the fair value of claims arising from the long-term share price component amounted to EUR 142 thousand (previous year: EUR 166 thousand) as of the reporting date. There was a payment of EUR 141 thousand (previous year: EUR 670 thousand) in fiscal year 2019. These were the payments in connection with the 2016 tranche.

The fair value of the claims arising from the long-term share price component is determined using a Monte Carlo simulation. The following valuation assumptions are applied:

	2019		2018	
	2019 tranche	2018 tranche	2018 tranche	2017 tranche
Share price (arithmetic mean) (EUR)	25.39	29.22	32.32	36.00
STOXX® TMI IE (arithmetic mean) (index points)	485.28	489.92	494.17	489.57
Risk-free interest (percent)	–0.626	–0.686	–0.652	–0.698
Volatility GEA share (percent)	35.96	35.96	34.71	34.71
Volatility STOXX® TMI IE (percent)	18.97	18.97	20.94	20.94
Correlation between GEA share and STOXX® TMI IE (percent)	52.55	52.55	58.94	58.94

The calculation of volatilities and correlation is based on historical market data. Risk-free interest rates were determined from German government bond yields.

Performance Share Plan

With effect from January 1, 2019, as part of its new remuneration system, GEA launched a tranche with the name "Performance Share Plan" for members of the Executive Board who had signed up for the plan. This is a cash-settled, share-based payment plan whereby members of the Executive Board are granted a certain number of phantom shares on a preliminary basis.

The Performance Shares are paid out at the end of a three-year performance period. With this scheme, the Total Shareholder Return (TSR) of GEA Group Aktiengesellschaft relative to the benchmark index (STOXX® Europe TMI Industrial Engineering), together with growth in EPS (Earnings per Share), adjusted for effects of restructuring measures and transactions, determine how many Performance Shares are ultimately paid out.

The TSR performance of all peer companies is ranked, whereupon the relative position of GEA Group Aktiengesellschaft is determined by referring to its ranking within this peer group. If the performance of the company's shares equates to the median in the TSR comparison, 100 percent of the performance shares are issued; if the score is at the bottom quartile or below, the degree of target achievement is equivalent to 0 percent. If GEA Group Aktiengesellschaft's shares outperform the benchmark index companies, 200 percent of the Performance Shares are issued. Other performance figures are interpolated between these values.

The total amount paid out corresponds to the number of Performance Shares allotted to a participant multiplied by the average share price over the last quarter of the three-year performance period.

The number of "Performance Shares" granted since the start of the issuance is 93,206. Taking into account the fair value as of December 31, 2019, of EUR 3,917 for the 2019 tranche, the group as a whole incurred an expense of the same order in fiscal year 2019.

6.4 Financial liabilities

Financial liabilities as of December 31, 2019, were composed of the following items:

(EUR thousand)	12/31/2019	12/31/2018
Borrower's note loan	249,653	249,569
Liabilities to banks	50,719	51,094
Lease liabilities	123,266	4,160
Liabilities from derivatives	137	223
Liabilities to equity investments	200	200
Noncurrent financial liabilities	**423,975**	**305,246**
Borrower's note loan	2,143	2,143
Liabilities to banks	23,624	17,297
Lease liabilities	58,888	2,235
Liabilities from derivatives	5,376	6,571
Liabilities to equity investments	9	226
Current financial liabilities	**90,040**	**28,472**
Total financial liabilities	**514,015**	**333,718**

The financing of GEA as of December 31, 2019 consisted mainly of the following items:

(EUR thousand)	Carrying amount 12/31/2019	Carrying amount 12/31/2018	Notional value 12/31/2019	Fair value 12/31/2019	Interest basis	Maturity
Borrower's note loan - tranche I	100,701	100,661	100,000	102,811	fix	February 26, 2023
Borrower's note loan - tranche II	101,063	101,036	100,000	105,156	fix	February 26, 2025
Borrower's note loan - tranche III	28,014	28,003	28,000	28,490	variable	February 26, 2023
Borrower's note loan - tranche IV	22,018	22,012	22,000	22,772	variable	February 26, 2025
European Investment Bank	50,000	50,000	50,000	50,816	variable	December 17, 2025
Bilateral credit lines	24,343	18,391	24,269	24,343	fix/variable	until further notice

Borrower's note loan

In February 2018, GEA Group Aktiengesellschaft issued a borrower's note loan with a volume of EUR 250,000 thousand. The borrower's note loan comprises four separate tranches with maturities of five and seven years, each divided into a fixed and a variable-interest part. The borrower's note loan was placed with institutional investors both at home and abroad.

Liabilities to banks

The maturities of liabilities to banks are as follows:

(EUR thousand)	12/31/2019	12/31/2018
< 1 year	23,624	17,297
1 - 2 years	–	888
2 - 3 years	437	206
3 - 4 years	282	–
4 - 5 years	–	–
> 5 years	50,000	50,000
Total	**74,343**	**68,391**

Liabilities to banks mainly comprise the EUR 50,000 thousand loan from the European Investment Bank (EIB) drawn in December 2018. The loan is scheduled for repayment in 2025.

Transaction costs for the unused syndicated credit line (club deal) as of the end of the year are allocated on a straight-line basis over the term.

GEA has undertaken in the loan agreements to comply with a certain covenant. Compliance with the covenant must be reviewed at the end of each quarter. The covenant was met as of December 31, 2019.

Liabilities to banks totaling EUR 1,353 thousand (previous year: EUR 1,415 thousand) were secured as of December 31, 2019.

Cash credit and guarantee credit lines

Including the syndicated credit line, the group as a whole had cash credit lines of EUR 1,133,689 thousand as of December 31, 2019 (previous year: EUR 1,123,694 thousand). Of this amount, cash credit lines of EUR 809,420 thousand (previous year: EUR 805,487 thousand) are unutilized (see section 3). In addition, guarantee credit lines for the performance of contracts, advance payments, and warranty obligations of EUR 1,316,415 thousand (previous year: EUR 1,321,007 thousand) were available to the group as a whole, of which EUR 890,727 thousand (previous year: EUR 784,954 thousand) has not been utilized.

Derivative financial instruments

Derivative financial instruments are explained in section 6.9.

6.5 Trade payables

Trade payables were as follows as of December 31, 2019:

(EUR thousand)	12/31/2019	12/31/2018
Trade payables	741,956	723,334
thereof to unconsolidated companies	689	2,064

Trade payables of EUR 740,086 thousand (previous year: EUR 722,702 thousand) are due within one year. The balance of EUR 1,870 thousand (previous year: EUR 632 thousand) is due after more than one year.

Trade payables in the amount of EUR 11,808 thousand (previous year: EUR 12,134 thousand) are secured.

6.6 Contract liabilities

Liabilities arising from contracts with customers were composed of the following items as of 12/31/2019:

(EUR thousand)	12/31/2019	12/31/2018
Advance payments for orders	272	364
Non-current contract liabilities	**272**	**364**
Advance payments for orders	226,852	216,080
Gross amount due to customers for contract work	412,583	406,868
Current contract liabilities	**639,435**	**622,948**
Total contract liabilities	**639,707**	**623,312**

Payments on account received for orders amounting to EUR 8,675 thousand (previous year: EUR 10,642 thousand) are secured.

Please see section 7.1 for a more extensive description of the contract liabilities.

6.7 Income tax liabilities

Income tax liabilities relate to current taxes and amounted to EUR 34,005 thousand (previous year: EUR 31,152 thousand) at the reporting date.

6.8 Other liabilities

Other liabilities as of December 31, 2019, comprised the following items:

(EUR thousand)	12/31/2019	12/31/2018
Other noncurrent liabilities	**21,438**	**23,744**
Other liabilities to unconsolidated subsidiaries	31,195	29,218
Liabilities from other taxes	39,663	43,832
Other liabilities	90,266	84,801
thereof social security	17,854	15,760
thereof other liabilities to employees	20,397	18,471
Other current liabilities	**161,124**	**157,851**
Total other liabilities	**182,562**	**181,595**

Payments on account amounting to EUR 3,746 thousand (previous year: EUR 3,191 thousand) are secured.

6.9 Financial instruments

The following tables provide an overview of the composition of financial instruments by class within the meaning of IFRS 7 as well as by measurement category.

		Measurement in accordance with IFRS 9				
(EUR thousand)	Carrying amount 12/31/2019	Amortized cost	Fair value through profit or loss	Fair value recognized in other comprehensive income	Measurement in accordance with other IFRSs	Fair value 12/31/2019
Assets						
Trade receivables	915,078	802,612	–	112,466	–	915,078
Cash and cash equivalents	354,559	354,559	–	–	–	–
Other financial assets	234,308	83,218	12,819	244	138,027	234,308
By IFRS 9 measurement category						
Financial assets measured at amortized cost	1,240,389	1,240,389	–	–	–	–
of which trade receivables	802,612	802,612	–	–	–	–
of which cash and cash equivalents	354,559	354,559	–	–	–	–
of which other financial assets	83,218	83,218	–	–	–	–
Financial assets measured at fair value recognized in other comprehensive income	112,710	–	–	112,710	–	112,710
of which trade receivables	112,466	–	–	112,466	–	112,466
of which other financial assets	244	–	–	244	–	244
Financial assets measured at fair value through profit or loss	12,819	–	12,819	–	–	12,819
of which other financial assets	8,963	–	8,963	–	–	8,963
of which derivatives not included in hedging relationships	3,856	–	3,856	–	–	3,856
Liabilities						
Trade payables	741,956	741,956	–	–	–	–
Financial liabilities	514,015	326,348	5,513	–	182,154	522,264
of which lease liabilities	182,154	–	–	–	182,154	–
Other liabilities	182,562	98,810	434	–	83,318	190,281
By IFRS 9 measurement category						
Financial liabilities measured at amortized cost	1,167,114	1,167,114	–	–	–	–
of which trade payables	741,956	741,956	–	–	–	–
of which bonds and other securitized liabilities	251,796	251,796	–	–	–	259,229
of which liabilities to banks	74,343	74,343	–	–	–	75,159
of which loan liabilities to unconsolidated subsidiaries	209	209	–	–	–	–
of which other liabilities to affiliated companies	31,195	31,195	–	–	–	–
of which other liabilities	67,615	67,615	–	–	–	75,334
Financial liabilities at fair value through profit or loss (derivatives not included in a hedging relationship and contingent consideration)	5,947	–	5,947	–	–	5,947

		Measurement in accordance with IFRS 9				
(EUR thousand)	Carrying amount 12/31/2018	Amortized cost	Fair value through profit or loss	Fair value recognized in other comprehensive income	Measurement in accordance with other IFRSs	Fair value 12/31/2018
Assets						
Trade receivables	923,884	827,050	–	96,834	–	923,884
Cash and cash equivalents	247,900	247,900	–	–	–	–
Other financial assets	222,251	95,000	13,115	245	113,891	222,251
By IFRS 9 measurement category						
Financial assets measured at amortized cost	1,169,950	1,169,950	–	–	–	–
of which trade receivables	827,050	827,050	–	–	–	–
of which cash and cash equivalents	247,900	247,900	–	–	–	–
of which other financial assets	95,000	95,000	–	–	–	–
Financial assets measured at fair value recognized in other comprehensive income	97,079	–	–	97,079	–	97,079
of which trade receivables	96,834	–	–	96,834	–	96,834
of which other financial assets	245	–	–	245	–	245
Financial assets measured at fair value through profit or loss	13,115	–	13,115	–	–	13,115
of which other financial assets	8,613	–	8,613	–	–	8,613
of which derivatives not included in hedging relationships	4,502	–	4,502	–	–	4,502
Liabilities						
Trade payables	723,334	723,334	–	–	–	–
Financial liabilities	333,718	320,529	6,794	–	6,395	330,292
of which Liabilities under finance leases	6,395	–	–	–	6,395	–
Other liabilities	181,595	96,545	594	–	84,456	187,108
By IFRS 9 measurement category						
Financial liabilities at amortized cost	1,140,408	1,140,408	–	–	–	–
of which trade payables	723,334	723,334	–	–	–	–
of which bonds and other securitized liabilities	251,712	251,712	–	–	–	247,595
of which liabilities to banks	68,391	68,391	–	–	–	69,082
of which loan liabilities to unconsolidated subsidiaries	426	426	–	–	–	–
of which other liabilities to affiliated companies	29,218	29,218	–	–	–	–
of which other liabilities	67,327	67,327	–	–	–	72,840
Financial liabilities at fair value through profit or loss (derivatives not included in a hedging relationship and contingent consideration)	7,388	–	7,388	–	–	7,388

In cases where the carrying amount of a financial instrument presents a reasonable approximation of its fair value, the latter is not disclosed separately.

The other financial assets measured at fair value through equity are all equity instruments, and these were designated as such upon initial recognition.

Financial assets and liabilities that are measured at fair value, or for which a fair value is disclosed in the notes to the consolidated financial statements, are required to be categorized according to the fair value hierarchy described in the following. Categorization within the levels of the fair value hierarchy is based on the measurement of the underlying inputs:

Level 1 inputs: quoted prices (unadjusted) in active markets for identical financial assets and liabilities.

Level 2 inputs: quoted market prices that are observable as direct (prices) or indirect (derived from prices) inputs used to measure fair value and that are not quoted prices as defined by Level 1.

Level 3 inputs: inputs that are not based on observable market data.

The following tables show the categorization of financial assets and financial liabilities into the three-level fair value hierarchy:

Recurring fair value measurements	12/31/2019			
	Carrying amount	Fair value		
(EUR thousand)		Level 1	Level 2	Level 3
Financial assets measured at fair value				
Trade receivables	112,466	–	112,466	–
Derivatives not included in hedging relationships	3,856	–	3,856	–
Other securities	8,963	–	–	8,963
Other financial assets	244	–	–	244
Financial liabilities measured at fair value				
Derivatives not included in hedging relationships	5,513	–	5,513	–
Contingent consideration	434	–	–	434
Financial liabilities not measured at fair value				
Borrower's note loan	251,796	–	259,229	–
Liabilities to banks	74,343	–	75,159	–
Other financial liabilities	26,440	–	13,571	20,588

Recurring fair value measurements	12/31/2018			
	Carrying amount	Fair value		
(EUR thousand)		Level 1	Level 2	Level 3
Financial assets measured at fair value				
Trade receivables	96,834	–	96,834	–
Derivatives not included in hedging relationships	4,502	–	4,502	–
Other securities	8,146	–	–	8,146
Other financial assets	712	–	–	712
Financial liabilities measured at fair value				
Derivatives not included in hedging relationships	6,794	–	6,794	–
Contingent consideration	594	–	–	594
Financial liabilities not measured at fair value				
Promissory note bonds	251,712	–	247,595	–
Liabilities to banks	68,391	–	69,082	–
Other financial liabilities	28,685	–	11,331	22,867

There were no transfers into or out of the levels of the fair value hierarchy in fiscal year 2019.

The fair values of trade receivables, cash and cash equivalents, term deposits, and other financial receivables essentially correspond to the carrying amounts; this is due to the predominantly short remaining maturities.

In the case of certain trade receivables measured at fair value due to existing factoring arrangements, that fair value is calculated on the basis of yield curves observable in the market. These are categorized within Level 2 of the fair value hierarchy.

The fair value of derivatives is determined using quoted exchange rates and yield curves observable in the market. Accordingly, these are categorized within Level 2 of the fair value hierarchy.

A receivable relating to the former raw material activities of Metallgesellschaft AG that had previously been written off was allocated to Level 3 financial instruments; its fair value is determined by means of a present value calculation on the basis of the debtor's payment plan. As the debtor operates a copper mine, its payment plan is influenced by the price of copper. Gains and losses from the subsequent measurement of the receivable are carried in profit or loss from discontinued operations.

The following table shows the changes in fair value in fiscal year 2019:

(EUR thousand)	
Fair value 12/31/2018	**8,146**
Interest income	253
Currency translation	564
Fair value 12/31/2019	**8,963**

As of December 31, 2019, the key, non-observable input factors of the above-mentioned receivable consisted of expected annual cash inflows of between EUR 229 thousand and EUR 2,496 thousand and an average, risk adjusted discount rate of 4.7 percent.

A potential change in one of the key, non-observable input factors could have affected the fair value of the receivable as follows (the other input factors remaining the same):

	12/31/2019 Profit or loss	
(EUR thousand)	Increase	Decrease
Expacted cash flows (10 % movement)	897	–897
Risk-adjusted discount rate (movement 100 basis points)	–244	255

GEA's other equity investments are also categorized within Level 3 of the hierarchy. The fair value is determined using inputs that are not based on observable market data.

Financial liabilities resulting from contingent purchase price considerations are assigned to Level 3 of the fair value hierarchy. The fair value of these liabilities is determined by means of present value calculations, taking into account various inputs that are not observable in the market, and that are based in particular on corporate planning, as specified in the respective purchase price clauses.

The fair value of borrower's note loans and liabilities to banks is measured on the basis of the yield curve, taking into account credit spreads. They are therefore categorized within Level 2 of the fair value hierarchy. The interest deferred as of the reporting date is included in the fair values.

Included in other financial liabilities is a contractual obligation undertaken in the context of a company acquisition. The fair value of this instrument is measured using contractual cashflows on the basis of the yield curve, taking into account credit spreads. Accordingly, these were categorized within Level 2 of the fair value hierarchy.

Certain other financial liabilities resulting from the sale of the GEA HX segment are categorized within Level 3 of the fair value hierarchy, since their fair value is measured on the basis of the present value of future cash outflows expected on the basis of contractual obligations associated with the sale.

GEA Group Aktiengesellschaft has entered into netting agreements with banks under the German Master Agreement for Financial Derivatives Transactions. As a general rule, the amounts owed under such agreements by each counterparty from all outstanding transactions in the same currency on a single day are aggregated to a single net amount payable by one party to the other. In the event of a credit event, such as late payment, all outstanding transactions under the agreement will be terminated, the value on termination calculated, and one single net amount paid to settle all transactions.

The following table shows the financial assets and liabilities for which the group as a whole has entered into netting agreements:

(EUR thousand)	Gross amounts of financial assets/ liabilties	Net amounts of financial assets/ liabilties, presented in the balance sheet	Respective amounts not netted in the balance sheet	Net amounts
12/31/2019				
Receivables from derivatives	3,734	3,734	3,470	264
Liabilities from derivatives	5,433	5,433	3,470	1,963
12/31/2018				
Receivables from derivatives	4,324	4,324	3,345	979
Liabilities from derivatives	6,283	6,283	3,345	2,938

The assets and liabilities shown are carried under other financial assets and other financial liabilities respectively.

Nonderivative financial assets

The carrying amount of the trade receivables and other financial assets that are subject to the IFRS 9 measurement requirements corresponds largely to their fair value.

Nonderivative financial liabilities

The carrying amount of the trade payables and other current liabilities that are subject to the measurement rules of IFRS 9 corresponds to their fair value. The fair value of non-current liabilities is the present value of their expected future cash flows. They are discounted at the rates prevailing at the reporting date.

Derivative financial instruments

The fair value of currency forwards at the reporting date is calculated on the basis of the spot exchange rate, taking into account forward premiums and discounts corresponding to the relevant remaining maturities. Forward premiums and discounts are derived from yield curves observable at the reporting date. The fair value of currency options is calculated on the basis of recognized valuation models. Fair value is affected by the remaining term of the option, the current exchange rate, the volatility of the exchange rate, and the underlying yield curves.

The fair value of interest rate swaps and options is determined on the basis of discounted expected future cash flows. Market interest rates applicable to the remaining maturities of these financial instruments are used. Cross-currency swaps also include the exchange rates of the relevant foreign currencies in which the cash flows are generated.

GEA uses derivative financial instruments, including currency forwards, interest rate swaps, and cross-currency swaps. Derivative financial instruments serve to hedge foreign currency risk and interest rate risk for existing or planned underlying transactions.

The following table presents the notional values and fair values of the derivative financial instruments in use as of the reporting date. The notional value in foreign currency is translated at the closing rate.

	12/31/2019		12/31/2018	
(EUR thousand)	Notional value	Fair value	Notional value	Fair value
Assets				
Currency derivatives not included in a hedging relationship	424,452	3,856	535,672	4,502
Total	**424,452**	**3,856**	**535,672**	**4,502**
Equity and liabilities				
Currency derivatives not included in a hedging relationship	486,577	5,513	570,005	6,794
Total	**486,577**	**5,513**	**570,005**	**6,794**

Derivative financial instruments included in recognized hedging relationships

As of December 31, 2019, the group as a whole had designated derivatives neither as cash flow hedges nor or as fair-value hedges. The same applies to the previous year.

Derivative financial instruments not included in recognized hedging relationships

If the criteria for recognizing a hedging relationship are not met, any change in fair value is recognized in profit or loss.

Income and expenses

The measurement effects from financial instruments have largely been recognized in profit or loss. The following table shows net income from financial instruments, broken down by the IFRS 9 measurement categories:

	12/31/2019			12/31/2018		
(EUR thousand)	Net income	thereof interest income/ expense	thereof impairment losses/ reversals of impairment losses	Net income	thereof interest income/ expense	thereof impairment losses/ reversals of impairment losses
Financial assets measured at amortized cost	21,851	2,538	–14,954	39,906	2,524	–14,315
Financial assets measured at fair value recognized in other comprehensive income	993	–	982	–1,388	–	–1,396
Equity instruments measured at fair value recognized in other comprehensive income	17	–	–	17	–	–
Financial assets / liabilities measured at fair value through profit or loss	24,452	–	–	22,207	–	–
Financial liabilities measured at amortized cost	–43,224	–10,903	–	–37,634	–7,644	–
Total	**4,089**	**–8,365**	**–13,972**	**23,108**	**–5,120**	**–15,711**

7. Consolidated income statement disclosures

7.1 Revenue

Revenue is composed of the following items:

(EUR thousand)	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
From construction contracts	1,972,845	2,040,228
From sale of goods and services	1,332,880	1,297,616
From service agreements	1,573,977	1,490,366
Total	**4,879,702**	**4,828,210**

Classification of revenues

GEA is classifying its revenues from contracts with customers according to revenue elements as well as geographical regions. The classification of the revenues corresponds with the presentation in segment reporting (see section 9.1).

Account balances

The table below provides information on receivables and contract assets/liabilities arising from contracts with customers.

(EUR thousand)	12/31/2019	12/31/2018	01/01/2018
Trade receivables	915,078	923,884	904,514
Contract assets	413,038	462,787	492,145
Contract liabilities	639,707	623,312	641,469

Trade receivables are unconditional claims for payment asserted by the group in respect of services rendered and invoiced. Trade receivables do not generally have an interest component and are due within 30 days as a rule.

Contract assets are claims for consideration asserted by the group in respect of services arising from production orders that had not been invoiced as of the reporting date. Amounts recognized as contract assets are reclassified to trade receivables as soon as the group obtains an unconditional right to payment.

Contract liabilities are essentially advance payments from customers for the construction of customer-specific plant and equipment for which revenues are realized over time.

The following material changes occurred with regard to our contract assets in the reporting period:

(EUR thousand)	01/01 - 12/31/2019	01/01 - 12/31/2018
Transfer from contract assets recognized at the beginning of the period to trade receivables	–437,698	–394,228
Due to changes in measure of progress	3,769	–
Due to business combinations	–	808
Due to deconsolidation of subsidiaries	–3,417	–
Due to impairment	–3,827	–1,537

During the year under review, the following changes had a material effect on contract liabilities:

(EUR thousand)	01/01 - 12/31/2019	01/01 - 12/31/2018
Revenue recognized that was included in contract liability balance at the beginning of the period	–561,989	–507,950
Due to business combinations	–	4,351

In the 2019 fiscal year, revenues in connection with performance obligations satisfied either fully or in part in earlier reporting periods amounted to EUR 5,575 thousand (previous year: EUR 8,493 thousand). This was mainly due to changes to contracts.

Contract assets comprise services in the amount of EUR 5,712 thousand (previous year: EUR 1,318 thousand), the invoicing of which had been subject to contractual delays as of December 31, 2019.

The following revenue expectations for subsequent periods are connected with existing performance obligations from contracts with customers that had either not been processed at all or only in part as of December 31, 2019:

(EUR thousand)	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
Revenue recognition < 1 year	2,212,078	2,208,195
Revenue recognition > 1 year	200,275	185,137
Total	**2,412,353**	**2,393,332**

Performance obligations

The group’s revenues are founded on the performance obligations summarized below:

Construction contracts

GEA Group manufactures customized turnkey production lines and engineering components for the food processing industry and a wide range of other processing industries for integration in complex production processes on the customer’s premises. Performance obligations arising from production orders are satisfied as the order progresses, and the underlying revenues recognized over time.

As a rule, an order is commenced upon receipt of an initial advance payment by the customer. Thereafter, work is billed according to the contractual arrangements, these progress billings normally being payable within 30 days. Advance payments received are recognized as contract liabilities if they are not matched by a corresponding service. Services that have not been invoiced are recognized as contract assets. If a customer cancels a contract, the group is entitled to reimbursement of the costs incurred so far, plus an appropriate margin.

The duration of the order depends on the size of the plant or equipment and the complexity of the design. Application areas vary from industry to industry and although orders can run over several months, the time to completion is rarely more than twelve months. In project business, which comprises the development and construction of process solutions, the time taken to complete plant and equipment is typically more than twelve months.

Obligations arising from guarantees and warranty assurances are reflected in the provisions and do not normally constitute distinct performance obligations (see section 6.2).

Components business

The group’s components business comprises the sale of both standardized and modular equipment for a large number of process industries. Depending on the terms of delivery, customers normally gain control over the individual machines and components when they take delivery of and accept the items at the point of destination, or earlier if the goods are transferred to a shipping agent.

It is at this point that invoices are generated and revenues realized. The invoices are normally payable within 30 days. In components business, discounts are granted that are deducted from the consideration payable.

Obligations arising from guarantees and warranty assurances are reflected in the provisions and do not normally constitute distinct performance obligations (see section 6.2).

Services

The group's service portfolio comprises services spanning the entire life cycle of customer plant and equipment. Performance obligations such as assembly, commissioning, maintenance, and plant modernization are satisfied in line with the performance completed to date.

Work such as this is normally invoiced when the service is completed and has been accepted by the customer, with payment due within 30 days. In service business, discounts are granted that are deducted from the consideration payable.

Obligations arising from guarantees and warranty assurances are reflected in the provisions and do not normally constitute distinct performance obligations (see section 6.2).

7.2 Other income

Other income is composed of the following items:

(EUR thousand)	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
Exchange rate gains	239,516	195,236
Gains on the measurement of foreign currency derivatives	65,127	82,027
Income from the release of provisions	–	26,272
Rental and lease income	1,144	1,114
Income from disposal of non-current assets	4,879	5,466
Income from compensation payments and cost reimbursements	1,641	1,904
Miscellaneous other income	26,522	24,376
Total	**338,829**	**336,395**

7.3 Other expenses

Other expenses are composed of the following items:

(EUR thousand)	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
Exchange rate losses	248,463	217,912
Goodwill impairment Pavan	247,589	–
Losses on the measurement of foreign currency derivatives	41,809	59,697
Expenses on the disposal of consolidated subsidiaries	16,634	21,150
Restructuring expenses according to IAS 37	586	1,054
Cost of money transfers and payment transactions	1,063	1,066
Losses on the disposal of non-current assets	1,337	1,422
Miscellaneous other expenses*	51,266	30,441
Total	**608,747**	**332,742**

*) This includes expenses for the settlement of legal disputes.

The losses recognized in the reporting year from the disposal of consolidated companies concern the GEA de Klokslag group, which was sold on November 6, 2019. This event gave rise to restructuring expenses of EUR 16,104 thousand (previous year: EUR 21,150 thousand) including deconsolidation losses of EUR 14,387 thousand (previous year: EUR 16,511 thousand).

7.4 Presentation of selected income and expenses by cost type

Cost of materials

The cost of materials included in cost of sales fell by EUR 45,700 thousand in the reporting period to EUR 2,354,315 thousand (previous year: EUR 2,400,015 thousand). Cost of materials was 47.9 percent of gross revenue and was therefore lower than the previous year's figure of 49.2 percent.

Personnel expenses

Personnel expenses increased by EUR 137,565 thousand in 2019 to EUR 1,517,528 thousand (previous year: EUR 1,379,963 thousand). The cost of unwinding the discount on expected pension obligations is not recognized under personnel expenses, but under financial and interest expenses. Personnel expenses include wages and salaries in the amount of EUR 1,251,220 thousand (previous year: EUR 1,125,061 thousand) as well as social security contributions and expenses for post-employment benefits of EUR 266,308 thousand (previous year: EUR 254,902 thousand). The ratio of personnel expenses to gross revenue thus rose to 30.9 percent (previous year: 28.3 percent).

Depreciation, amortization and impairment losses

Depreciation, amortization, and impairment losses totaling EUR 483,313 thousand (previous year: EUR 170,571 thousand) were charged on property, plant, equipment, investment property and intangible assets, especially goodwill, in the reporting period. For the most part, depreciation, amortization, and impairment losses are largely included in the cost of sales or, in the case of goodwill, in other expenses.

Impairments on nonderivative financial assets excluding trade receivables amounted to EUR 333 thousand in the reporting period (previous year: EUR 845 thousand). Of this amount, EUR 333 thousand (previous year: EUR 845 thousand) was attributable to noncurrent financial assets. Impairment losses on equity investments and marketable securities are contained in the financial expenses item. In the current reporting year, reversals of impairment losses on current financial assets were recognized in the amount of EUR 171 thousand (previous year: EUR 0 thousand). Inventories were adjusted to the tune of EUR 21,696 thousand (previous year: EUR 17,822 thousand). These impairment losses and the remaining impairment losses were recognized in cost of sales.

7.5 Financial and interest income

Other financial income

Financial income comprises the following items:

(EUR thousand)	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
Income from reversal of impairment losses on financial assets	171	–
Income from profit transfer agreements from non consolidated companies	186	249
Income from other equity investments	1,593	1,611
thereof from unconsolidated subsidiaries	1,576	1,594
Total	**1,950**	**1,860**

Interest income

Interest and similar income is composed of the following items:

(EUR thousand)	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
Interest income on receivables, cash investments, and marketable securities	2,538	2,524
thereof from unconsolidated subsidiaries	571	155
Interest income from changes in interest rates other provisions	11,533	–
Other interest income	1,262	2,134
Total	**15,333**	**4,658**

The following table shows the interest income on financial instruments broken down by the IFRS 9 measurement categories, along with the interest income on assets measured in accordance with other requirements:

(in T EUR)	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
Financial assets measured at amortized cost	2,538	2,524
Financial assets not measured in accordance with IFRS 9	12,795	2,134
Summe	**15,333**	**4,658**

7.6 Financial and interest expenses

Other financial expenses

Financial expenses are composed of the following items:

(EUR thousand)	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
Impairment loss on equity investments in unconsolidated companies	188	845
Impairment losses on financial assets	145	–
Losses transferred under profit and loss transfer agreements	1,087	1,415
Loss on net monetary positions (hyper inflation)	1,691	4
Other remaining financial expense	–	283
Summe	**3,111**	**2,547**

Interest expense

Interest and similar expenses comprised the following items:

(EUR thousand)	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
Interest expenses on liabilities to banks	5,850	5,007
Interest expenses on lease liability	4,997	300
Interest cost from discount unwinding on pension and medical care obligations	12,628	12,954
Interest cost from discount unwinding on discounted provisions and other employee benefit obligations	2,803	12,209
Other interest expenses	5,492	3,277
thereof to unconsolidated subsidiaries	18	14
Total interest expenses	**31,770**	**33,747**

The following table shows the interest expenses on financial instruments broken down by the IFRS 9 measurement categories, along with the interest expenses on liabilities measured in accordance with other requirements:

(EUR thousand)	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
Financial liabilities at amortized cost	10,903	7,644
Financial liabilities not measured in accordance with IFRS 9	20,867	26,103
Total	**31,770**	**33,747**

If finance can be allocated to a specific investment, the actual borrowing costs are capitalized as part of the cost of the investment. Where no direct relationship can be established, the average interest rate for group borrowings in the current period is used as the capitalization rate due to GEA's central financing function. This amounted to 1.2 percent in 2019 (previous year: 0.8 percent). Interest income generated on advance payments and progress payments received reduces the cost of the asset. No material borrowing costs were capitalized in fiscal year 2019 or in the previous year.

In fiscal year 2019, expenses totaling EUR 1,063 thousand (previous year: EUR 1,066 thousand) were incurred for fees that were not included in the calculation of the effective interest rate.

Due to high inflation, business activity in Argentina is no longer accounted for on the basis of historical costs of acquisition and sales, but adjusted for the effects of inflation. The consumer price index IPC (Índice de precios al consumidor) is used for this purpose. The value of the index applied on the reporting date amounted to 967.8 (January 1, 2019: 629.1); the previous year it was 629.1 (January 1, 2018: 426.7).

7.7 Taxes on income

Income taxes for continuing operations are composed of the following items:

(EUR thousand)	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
Current taxes	82,332	64,203
Germany	11,380	9,105
Other countries	70,952	55,098
Deferred taxes	–21,300	51,338
thereof related to temporary dfferences	–28,365	–6,059
Total	**61,032**	**115,541**

The expected tax expense is calculated using the tax rate of 30.00 percent (previous year: 30.00 percent) applicable to German group companies. This includes an average trade tax rate of 14.17 percent (previous year: 14.17 percent) in addition to the uniform corporate income tax rate of 15.00 percent (previous year: 15.00 percent) and the solidarity surcharge of 0.825 percent (previous year: 0.825 percent). The following table shows a reconciliation of the expected tax rate to the effective tax rate of –48.62 percent (previous year: 50.08 percent):

	01/01/2019 - 12/31/2019		01/01/2018 - 12/31/2018	
	(EUR thousand)	(%)	(EUR thousand)	(%)
Profit before tax	**–125,522**		**230,692**	
Expected tax expense	–37,657	30.00	69,208	30.00
Non-tax deductible expense	76,920	–61.28	11,104	4.81
Tax-exempt income	–3,191	2.54	–1,068	–0.46
Change in valuation allowances	–3,703	2.95	46,236	20.04
Change in tax rates	2,461	–1.96	–1,161	–0.50
Foreign tax rate differences	9,998	–7.97	–10,520	–4.56
Taxes relating to other periods	8,574	–6.83	–7,039	–3.05
Other	7,630	–6.07	8,781	3.80
Income tax and effective tax rate	**61,032**	**–48.62**	**115,541**	**50.08**

The non-tax-deductible expenses of EUR 76,920 thousand include, among other items, non-deductible expenses from recognizing a goodwill impairment loss of EUR 59,424 thousand on Pavan S.p.A. and a non-deductible loss of EUR 4,220 thousand on the disposal of GEA de Klokslag Engineering B.V.

The change in valuation allowances is mainly attributable to a reassessment of the recoverable amount of deferred tax assets on tax loss carryforwards. The amount of EUR –3,703 thousand (previous year: EUR 46,236 thousand) includes, among other items, valuation allowances recognized on deferred tax assets on tax loss carryforwards in the U.S. (EUR 10,343 thousand), because a smaller amount of loss carryforwards is expected to be usable due to the subdued provisional outlook for business development. The item further includes an offsetting amount of income (EUR –15,935 thousand) from the reversal of valuation allowances in Germany, because GEA believes that tax loss carryforwards, on which valuation allowances had previously been recognized, will be utilized in the future due to an intragroup restructuring.

The tax rate change, which had an effect of EUR 2,461 thousand, is mainly due to the reduction of tax rates in the Netherlands.

The foreign tax rate differences are due to different tax rates outside Germany in comparison to the German tax rate of 30.00 percent. The tax rates for foreign companies vary between 0.00 percent (UAE) and 34.00 percent (Brazil).

Taxes relating to other periods amounted to EUR 8,574 thousand; they comprise prior-period current taxes of EUR 4,488 thousand and prior-period deferred taxes of EUR 4,086 thousand.

Other reconciliation effects mainly include withholding tax and other foreign tax expense of EUR 9,040 thousand (previous year: EUR 7,660 thousand).

Deferred tax assets and liabilities as of the reporting date can be broken down by maturity as follows:

(EUR thousand)	12/31/2019	12/31/2018
Current deferred tax assets	102,760	69,035
Non-current deferred tax assets	248,795	237,047
Total deferred tax assets	**351,555**	**306,082**
Current deferred tax liabilities	34,041	37,080
Non-current deferred tax liabilities	70,241	65,928
Total deferred tax liabilities	**104,282**	**103,008**
Net deferred tax assets	**247,273**	**203,074**

GEA recognized within the deferred tax assets an amount of EUR 3,049 thousand which refers to the French tax group and is attributable in particular to the capitalisation of deferred taxes on tax losses carried forward, which were recognised at a GEA subsidiary in France. GEA concludes for these recognized deferred tax assets, that it is probable that future taxable profit will be available against which the unused tax losses can be utilized. The tax loss carryforwards in France can be carried forward for an indefinite period.

Deferred tax assets and liabilities as of December 31, 2019, and 2018, are composed of the following items:

	Deferred tax assets		Deferred tax liabilities	
(EUR thousand)	2019	2018	2019	2018
Property, plant and equipment	4,702	5,207	61,666	23,186
Investment property	–	–	1	–
Goodwill	3,724	4,628	32,275	31,733
Other intangible assets	121	211	85,725	102,891
Other non-current financial assets	985	1,890	3,899	3,889
Non-current assets	**9,532**	**11,936**	**183,566**	**161,699**
Inventories	121,926	31,849	4,033	6,218
Trade receivables and contract assets	29,065	15,355	99,256	67,168
Other current financial assets	15,011	14,253	12,210	14,897
Cash and cash equivalents	691	97	114	1
Current assets	**166,693**	**61,554**	**115,613**	**88,284**
Total assets	**176,225**	**73,490**	**299,179**	**249,983**
Non-current provisions	19,035	27,461	18	754
Non-current employee benefit obligations	129,387	115,217	109	592
Non-current financial liabilities	22,805	157	1,160	133
Other non-current liabilities and non-current contract liabilities	439	485	1,734	1,200
Non-current liabilities	**171,666**	**143,320**	**3,021**	**2,679**
Current provisions	24,349	23,930	18,514	3,366
Current employee benefit obligations	15,861	9,303	68	92
Current financial liabilities	10,723	1,009	678	117
Trade payables	41,506	15,974	16,175	7,427
Other current liabilities and current contract liabilities	21,201	5,494	69,968	6,576
Current liabilities	**113,640**	**55,710**	**105,403**	**17,578**
Total equity and liabilities	**285,306**	**199,030**	**108,424**	**20,257**
Valuation allowances on temporary differences	–2,732	–1,711	–	–
Deferred taxes on temporary differences	**458,799**	**270,809**	**407,603**	**270,240**
Tax loss carryforwards	697,918	712,435	–	–
Valuation allowances on tax loss carryforwards	–501,841	–509,930	–	–
Offsetting of deferred taxes	–303,321	–167,232	–303,321	–167,232
Recognized deferred taxes	**351,555**	**306,082**	**104,282**	**103,008**

The following changes in deferred taxes were recognized through profit or loss in the reporting year:

(EUR thousand)	01/01/2019 - 12/31/2019
Property, plant and equipment	38,985
Investment property	1
Goodwill	1,446
Other intangible assets	–15,825
Other non-current financial assets	760
Non-current assets	**25,367**
Inventories	–92,262
Trade receivables and contract assets	22,925
Other current financial assets	–3,471
Cash and cash equivalents	–481
Current assets	**–73,289**
Total assets	**–47,922**
Non-current provisions	3,002
Non-current employee benefit obligations	10,675
Non-current financial liabilities	–21,621
Other non-current liabilities and non-current contract liabilities	580
Non-current liabilities	**–7,364**
Current provisions	14,591
Current employee benefit obligations	–6,583
Current financial liabilities	–8,660
Trade payables	–16,784
Other current liabilities and current contract liabilities	43,139
Current liabilities	**25,703**
Total equity and liabilities	**18,339**
Valuation allowances on temporary differences	1,021
Subtotal	**–28,562**
Other tax effects through profit and loss	197
Deferred taxes on temporary differences through profit and loss	**–28,365**
Valuation allowances on tax loss carryforwards	7,065
Total deferred taxes through profit and loss	**–21,300**

Deferred tax liabilities of EUR 1,328 thousand (previous year: EUR 1,696 thousand) were recognized as of December 31, 2019, for expected dividend payments from subsidiaries. In this context, as of December 31, 2019, deferred tax liabilities of EUR 1,786 thousand (previous year: EUR 1,510 thousand) were recognized for withholding taxes likely to be incurred.

As of December 31, 2019, no deferred taxes were recognized for taxable temporary differences arising from investments in subsidiaries in the amount of EUR 321,213 thousand (previous year: EUR 497,216 thousand) since the company is able to control their reversal and no reversals will be made in the foreseeable future.

Deferred tax assets and liabilities are offset if there is a legally enforceable right to set off current tax assets against current tax liabilities and if the deferred taxes relate to income taxes levied by the same taxation authority.

As of December 31, 2019, GEA recognized deferred tax assets in the amount of EUR 196,077 thousand (previous year: EUR 202,505 thousand) on tax loss carryforwards:

(EUR thousand)	12/31/2019	12/31/2018
Deferred tax assets on domestic tax loss carryforwards:		
Corporate income tax	67,000	54,955
Trade tax	57,000	61,248
Deferred tax assets on foreign tax loss carryforwards	72,077	86,302
Total	**196,077**	**202,505**

The total amount of the deferred tax assets on tax loss carryforwards largely relates to Germany and the U.S.

Deferred tax assets were fully impaired for corporate income tax loss carryforwards of EUR 1,245,966 thousand (previous year: EUR 1,305,094 thousand), trade tax loss carryforwards of EUR 876,558 thousand (previous year: 888,821 thousand), and loss carryforwards in connection with U.S. state taxes of EUR 1,872,370 thousand (previous year: EUR 1,820,631 thousand) as their utilization is not sufficiently certain.

Also, as a general rule, deferred tax assets are not recognized in Germany for corporate income tax loss carryforwards (EUR 86,364 thousand; previous year: EUR 85,657 thousand) and trade tax loss carryforwards (EUR 33,656 thousand; previous year: EUR 33,656 thousand) prior to fiscal unity. Overseas, deferred tax assets are not recognized for income tax loss carryforwards of EUR 20,460 thousand (previous year: EUR 12,502 thousand).

The tax loss carryforwards of the German companies can be carried forward for an indefinite period. Foreign tax loss carryforwards can generally only be utilized for a limited period. The significant tax loss carryforwards of the foreign companies are expected to expire in 2029.

7.8 Income on discontinued operations

Discontinued operations comprise the remaining risks from the 2014 sale of GEA Heat Exchangers and of the plant engineering activities in previous years, especially Lurgi and Lentjes, and the continued process of winding-up past discontinued operations, including individual legal disputes arising from them.

Earnings from discontinued operations in fiscal year 2019 amounted to EUR 19.2 million (previous year: EUR 13.8 million); this was largely attributable to a change in the interest rate used to measure a non-current provision, as well as to expenses of EUR 4.8 million (previous year: EUR 20.0 million). The pre-tax profit from discontinued operations thus amounted to EUR 14.3 million (previous year: EUR –6.3 million). This mainly resulted from the development of residual risks in connection with businesses sold by GEA in previous years.

All told, profit after tax from these discontinued operations of EUR 15,883 thousand (previous year: EUR –1,618 thousand) had an impact on consolidated profit. This profit will be allocated in full to the shareholders of GEA Group Aktiengesellschaft. Tax income attributable to discontinued operations amounted to EUR 1,548 thousand (previous year: EUR 4,642 thousand).

7.9 Earnings per share

Earnings per share are calculated as follows:

(EUR thousand)	01/01/2019 - 12/31/2019	01/01/2018 - 12/31/2018
Profit for the period attributable to shareholders of GEA Group Aktiengesellschaft	–170,575	113,435
thereof from continuing operations	–186,458	115,053
thereof from discontinued operations	15,883	–1,618
Weighted average number of shares outstanding (thousand)	180,492	180,528
Basic and diluted earnings per share (EUR)		
from profit for the period	–0.95	0.63
thereof attributable to continuing operations	–1.03	0.64
thereof attributable to discontinued operations	0.09	–0.01

7.10 Appropriation of net profit

GEA Group Aktiengesellschaft reported net income for the fiscal year of EUR 284,481 thousand in accordance with the HGB (previous year: EUR 32,035 thousand). Of this amount, EUR 131,000 thousand was transferred to other retained earnings (previous year: withdrawal of EUR 121,000 thousand). Including profit brought forward of EUR 752 thousand (previous year: EUR 1,135 thousand), the net retained profits amounted to EUR 154,233 thousand (previous year: EUR 154,170 thousand).

The Executive Board and Supervisory Board will propose to the Annual General Meeting that the net retained profits be appropriated as follows:

Appropriation (EUR thousand)	2019	2018
Dividend payment to shareholders	153,418	153,418
Profit carried forward	815	752
Total	**154,233**	**154,170**

The dividend payment corresponds to the payment of a dividend of EUR 0.85 per share for a total of 180,492,172 shares (previous year: 180,492,172 shares). The dividend will be paid from the contribution account for tax purposes (section 27 of the Körperschaftsteuergesetz (KStG – German Corporate Income Tax Act)) and therefore without deduction of investment income tax and the solidarity surcharge. In the case of shareholders in Germany, the dividend is not subject to current taxation in the year of payment. The opinion of the German tax authorities (see also the Federal Ministry of Finance (BMF) circular dated 1/18/2016, para. 92) is that the payment of dividends from the contribution account for tax purposes constitutes a repayment of shareholder contributions, which results in a retrospective reduction in the cost of the shares. This can lead to the imposition of higher capital gains taxes if the shares are sold at a later date.

8. Contingent Liabilities, other Financial Obligations, Contingent Assets, and Litigation

8.1 Contingent liabilities

GEA has issued or instructed the issue of both bank and group guarantees in favor of customers or lenders. The obligations presented in the following table relate to contingent liabilities for which the primary debtor is not a consolidated company of the group as a whole.

	Bank guarantees		Group guarantees	
(EUR thousand)	2019	2018	2019	2018
Guarantees for prepayments	3,134	5,539	–	561
Warranties	11	309	775	350
Performance guarantees	7,008	11,314	136,423	139,615
Other declarations of liability	1,088	2,671	14,233	6,133
Total	**11,241**	**19,834**	**151,431**	**146,659**
thereof attributable to GEA Heat Exchangers	4,731	11,211	41,215	46,235
thereof attributable to Lurgi	–	–	96,300	94,483

A significant proportion of the bank guarantees and most of the group guarantees are attributable to the GEA Heat Exchangers segment which was sold on October 31, 2014, as well as to the operating activities of Lurgi which were disposed of in previous years (see section 3).

The other guarantees relate mainly to customers of unconsolidated companies and to banks. The beneficiaries are entitled to asset claims under the guarantees if the primary debtor fails to meet its contractual obligations, for example, in the case of late or defective delivery, noncompliance with warranted performance parameters, or failure to repay loans in accordance with the contractual requirements.

The guarantees include contingent liabilities of EUR 6,466 thousand resulting from joint ventures (previous year: EUR 7,391 thousand); there is no further liability above and beyond this.

All guarantees issued by or on the instructions of GEA Group Aktiengesellschaft are issued on behalf of and with recourse against the relevant primary debtor.

In addition to the liability risks resulting from bank and group guarantees, there are risks in particular from court, arbitration, or out-of-court disputes (see section 8.3) that could result in cash outflows.

8.2 Other financial obligations

The other financial obligations of the group as a whole as of December 31, 2019, are composed of the following items:

(EUR thousand)	12/31/2019	12/31/2018
Purchase commitments	159,541	154,401
Total	**159,541**	**154,401**

EUR 151,585 thousand (previous year: EUR 140,426 thousand) of the purchase commitments is attributable to inventories.

8.3 Litigation

With regard to litigation, please refer to the section entitled “Legal risks” in the management report.

9. Segment Reporting

9.1 Operating segments

GEA's business activities are divided into the following two business areas:

Business Area Equipment

The Business Area Equipment brings together all activities ranging from largely standardized to customer-specific equipment offerings. The products are primarily manufactured as part of series production on a standardized and modular basis. Typical products of this business area include separators, valves, pumps, homogenizers and refrigeration equipment such as compressors. The equipment portfolio also includes process technology for food processing and packaging, for example extrusion and milling equipment. The product range also extends to dairy equipment, feeding systems and slurry engineering as well as an entire service portfolio.

Business Area Solutions

The Business Area Solutions encompasses all group activities related to customer-specific products, projects, after-sales and services. These range from small projects to complete systems and facilities tailored to specific applications and customer requirements. The offering primarily includes the engineering, design and delivery of customized process solutions for the dairy, food, beverage, pharma and chemical industries. This business area also provides process-critical, industrial refrigeration and sustainable energy solutions across all markets served.

Other companies

A Global Corporate Center provides centralized support to all management and administrative functions and performs the management functions for the entire group. This includes the groupwide management of strategy, human resources, legal and tax matters, mergers & acquisitions, the central financial organization, internal auditing, marketing & communication and IT. As of November 1, 2018, all functions previously combined under the independent Shared Service Center (SSC) have been integrated into the Global Corporate Center. The control and administrative functions bundled in the Global Corporate Center do not constitute independent operating segments. The operating expenses of the Global Corporate Center are allocated, where possible to the business areas.

Activities that are not part of core business are not disclosed in the data of the business areas. This includes investment property held for sale, pension obligations, and liabilities related to discontinued operations.

(EUR million)	BA-E	BA-S	Others	Consolidation	GEA
01/01/2019 - 12/31/2019					
Order intake[1]	2,690.3	2,517.4	–	–276.5	**4,931.1**
External revenue	2,472.1	2,407.6	–	–	**4,879.7**
Intersegment revenue	210.1	54.9	–	–265.0	**–**
Total revenue	2,682.2	2,462.5	–	–265.0	**4,879.7**
Gross profit before restructuring measures[2]	–	554.3	–	–	**–**
Share of profit or loss of equity-accounted investments	1.0	0.1	–0.4	–	**0.7**
EBITDA before restructuring measures	387.2	132.7	–43.6	2.9	**479.2**
as % of revenue	14.4	5.4	–	–	**9.8**
EBITDA	349.2	92.4	–70.1	2.9	**374.4**
EBIT before restructuring measures	271.0	62.0	–64.6	3.0	**271.4**
as % of revenue	10.1	2.5	–	–	**5.6**
EBIT	–33.7	12.7	–91.1	3.0	**–109.1**
as % of revenue	–1.3	0.5	–	–	**–2.2**
ROCE in %[3]	14.9	8.8	–	–	**10.6**
Interest income	6.0	7.2	27.4	–25.3	**15.3**
Interest expense	24.3	13.6	19.2	–25.3	**31.8**
Income taxes	30.1	14.2	17.7	–0.9	**61.0**
Profit or loss from discontinued operations	–	–	15.9	–	**15.9**
Segment assets	3,774.5	3,000.7	3,110.1	–4,174.7	**5,710.6**
Segment liabilities	2,056.2	1,832.9	2,088.5	–2,357.1	**3,620.5**
Carrying amount of equity-accounted investments	3.2	1.9	0.5	–	**5.7**
Working capital (reporting date)[4]	620.6	86.0	–15.0	–9.5	**682.0**
Additions in property, plant, and equipment, intangible assets, and goodwill	169.2	156.5	55.0	–	**380.7**
Depreciation and amortization	117.1	70.6	14.7	–0.1	**202.3**
Impairment losses	265.8	9.2	6.3	–	**281.2**
Additions to provisions	193.5	178.4	98.3	8.5	**478.7**

(EUR million)	BA-E	BA-S	Others	Consolidation	GEA
01/01/2018 - 12/31/2018					
Order intake[1]	2,662.4	2,499.1	–	–243.7	**4,917.7**
External revenue	2,442.0	2,386.2	–	–	**4,828.2**
Intersegment revenue	185.6	54.8	–	–240.4	**–**
Total revenue	2,627.6	2,441.1	–	–240.4	**4,828.2**
Gross profit before restructuring measures[2]	–	561.1	–	–	**–**
Share of profit or loss of equity-accounted investments	1.3	0.4	–	–	**1.7**
EBITDA before restructuring measures	386.7	121.4	–28.6	–7.8	**471.8**
as % of revenue	14.7	5.0	–	–	**9.8**
EBITDA	360.8	119.0	–40.9	–7.8	**431.2**
EBIT before restructuring measures	274.6	77.7	–37.9	–7.6	**306.8**
as % of revenue	10.5	3.2	–	–	**6.4**
EBIT	242.3	75.3	–50.2	–7.6	**259.8**
as % of revenue	9.2	3.1	–	–	**5.4**
ROCE in %[3]	15.2	11.8	–	–	**12.3**
Interest income	4.8	6.6	16.0	–22.8	**4.7**
Interest expense	21.2	9.2	26.2	–22.8	**33.7**
Income taxes	18.7	26.2	65.9	4.7	**115.5**
Profit or loss from discontinued operations	–	–	–1.6	–	**–1.6**
Segment assets	4,221.7	2,959.1	3,169.0	–4,630.8	**5,719.1**
Segment liabilities	1,954.7	1,695.5	2,394.7	–2,775.2	**3,269.6**
Carrying amount of equity-accounted investments	9.3	2.6	–	–	**11.9**
Working capital (reporting date)[4]	620.7	111.1	22.8	–7.6	**747.0**
Additions in property, plant, and equipment, intangible assets, and goodwill	99.9	57.9	10.6	–0.0	**168.3**
Depreciation and amortization	101.5	35.0	9.3	–0.1	**145.7**
Impairment losses	17.0	8.7	–	–	**25.7**
Additions to provisions	113.9	167.8	57.4	–15.6	**323.4**

1) Unaudited supplemental information.
2) Included in internal reporting of BA-S only.
3) ROCE = EBIT before restructuring measures/capital employed; EBIT before restructuring measures and capital employed both calculated as the average for the last 4 quarters and before effects relating to goodwill from the acquisition of the former GEA AG by the former Metallgesellschaft AG in 1999; capital employed = non-current assets less interest-bearing non-current assets + working capital + non-interest-bearing assets, liabilities and provisions less assets and liabilties in connection with income taxes.
4) Working capital = inventories + trade receivables + contract assets – trade payables – contract liabilities – provisions for anticipated losses (PoC)

Consolidation primarily comprises the elimination of investments in subsidiaries, intragroup receivables, liabilities, revenue, and income and expenses. Intersegment revenue is calculated using standard market prices.

In the presentation of segment disclosures by geographic region, revenue is allocated by the destination of the goods or place of performance of the services or by customer domicile.

(EUR million)	BA Equipment	BA Solutions	Consolidation	GEA
01/01/2019 - 12/31/2019				
Revenue by revenue element				
From construction contracts	300.7	1,724.5	–52.4	1,972.8
From sale of goods and services	1,344.2	142.1	–153.4	1,332.9
From service agreements	1,037.2	595.9	–59.1	1,574.0
Total	**2,682.2**	**2,462.5**	**–265.0**	**4,879.7**
Revenue by geografical region				
Germany	303.0	147.4	–25.9	424.6
Asia Pacific	559.2	629.1	–62.2	1,126.1
ACH & Eastern Europe	308.4	301.1	–34.3	575.2
Western Europe, Middle East & Africa	443.5	414.0	–43.3	814.2
North- and Central Europe	345.1	407.3	–68.0	684.4
Latin America	187.2	194.1	–16.0	365.3
North America	535.8	369.5	–15.3	890.0
Total	**2,682.2**	**2,462.5**	**–265.0**	**4,879.7**

In the reporting period, revenue of EUR 768.3 million (previous year: EUR 734.7 million) was attributable to the United States of America and EUR 439.9 million (previous year: EUR 379.7 million) was attributable to the People's Republic of China. There are no relationships with individual customers whose revenue can be considered material in comparison to total group revenue.

(EUR million)	BA Equipment	BA Solutions	Consolidation	GEA
01/01/2018 - 12/31/2018				
Revenue by revenue element				
From construction contracts	324.8	1,767.7	–52.3	2,040.2
From sale of goods and services	1,330.5	104.1	–136.9	1,297.6
From service agreements	972.3	569.3	–51.2	1,490.4
Total	**2,627.6**	**2,441.1**	**–240.4**	**4,828.2**
Revenue by geografical region				
Germany	305.5	159.9	–27.9	437.6
Asia Pacific	479.4	638.9	–37.5	1,080.8
ACH & Eastern Europe	300.5	330.1	–29.4	601.2
Western Europe, Middle East & Africa	468.0	427.6	–43.1	852.5
North- and Central Europe	354.3	356.5	–67.7	643.2
Latin America	173.0	187.9	–14.3	346.6
North America	546.8	340.0	–20.5	866.4
Total	**2,627.6**	**2,441.1**	**–240.4**	**4,828.2**

As stated in the 2018 Annual Report, since the start of the 2019 financial year – in line with its internal control system – GEA's management has been using the key indicator of "earnings before interest, taxes, depreciation and amortization" (EBITDA) before restructuring expenses in addition to revenue as a measure of its operating performance. "EBITDA before restructuring" is an indicator that has been adjusted for earnings effects attributable to restructuring measures outlined in terms of content and scope by the CEO, presented to the Chairman of the Supervisory Board, and – where required by the Board's rules of procedure – approved and finalized by the Supervisory Board. Only measures requiring funding in excess of EUR 2 million are taken into account.

In accordance with the above definition, adjustments for restructuring expenses in 2019 totaled EUR 380.5 million (previous year: EUR 47.0 million), with EBITDA accounting for EUR 104.9 million (previous year: EUR 40.6 million) of this amount. In this context, the term restructuring expenses relates to expenditures directly connected to restructuring measures (e.g. severance payments) that would therefore qualify as restructuring expenses under IAS 37 too. The restructuring measures defined by the Board also extend to impairment losses on assets, as well as to other expenses arising indirectly from the restructuring measures.

The restructuring expenses incurred in fiscal year 2019 can be allocated to the various business segments as follows:

(EUR million)	BA Equipment	BA Solutions	Sonstige	GEA
Restructuring according to IAS 37	24.9	21.2	9.2	55.3
Impairments and reversals of impairments	269.3	10.7	–	280.0
Gains and losses from the disposal of selected parts of operations	–	16.1	–	16.1
Others	10.5	1.4	17.3	29.2
Total	**304.6**	**49.4**	**26.5**	**380.5**

Since the start of the 2019 financial year, ROCE (Return on Capital Employed) has been deployed as a key financial performance indicator. This strategic indicator measures the relative profitability of a company in relation to the weighted cost of capital used (Weighted Average Cost of Capital, WACC). If the ROCE is above the WACC, this is an indication that the business is gaining in value.

Reconciliation of EBITDA before restructuring measures to EBIT (EUR million)	2019	2018	Change in %
EBITDA before restructuring measures	**479.2**	**471.8**	**1.6**
Depreciation of property, plant, and equipment, investment property, and amortization of intangible assets	–202.3	–145.7	–
Impairment losses and reversals of impairment losses on property, plant, and equipment, investment property, intangible assets, and goodwill	–5.4	–18.4	–
Other impairment losses and reversals of impairment losses	–0.1	–0.8	–
EBIT before restructuring measures	**271.4**	**306.8**	**–11.5**
Restructuring measures	–380.5	–47.0	–
EBIT	**–109.1**	**259.8**	**–**

The following table shows the reconciliation of EBITDA to EBIT:

Reconciliation of EBITDA to EBIT (EUR million)	2019	2018
EBITDA	**374.4**	**431.2**
Depreciation of property, plant, and equipment, investment property, and amortization of intangible assets (see notes 5.1, 5.3, 5.5)	–202.3	–145.7
Impairment losses and reversals of impairment losses on property, plant, and equipment, investment property, intangible assets, and goodwill (see notes 5.1, 5.3, 5.4, 5.5)	–281.1	–24.9
Impairment losses and reversals of impairment losses on non-current financial assets	–0.1	–0.8
EBIT	**–109.1**	**259.8**

9.2 Disclosures by geographic region

Assets are allocated by their location. The figures quoted relate to the group as a whole.

(EUR millions)	Germany	Asia Pacific	ACH & Eastern Europe	Western Europe, Middle East & Africa	North- and Central Eruope	Latin America	North America	**Total**
01/01/2019 - 12/31/2019								
Non-current assets (property, plant and equipment, intangible assets, and investment property)	1,023.0	158.0	92.5	459.6	736.7	5.9	186.5	**2,662.2**
01/01/2018 - 12/31/2018								
Non-current assets (property, plant and equipment, intangible assets, and investment property)	960.5	134.2	69.1	693.1	720.3	4.1	177.7	**2,759.0**

The carrying amounts of non-current assets (property, plant, and equipment, intangible assets, and investment property) in the Netherlands amounted to EUR 359.7 million (previous year: EUR 382.9 million) as of the reporting date, and in Italy to EUR 412.9 million (previous year: EUR 665.5 million).

10. Other Disclosures

10.1 Cash flow disclosures

Cash flow from operating activities in fiscal year 2019 included outflows of EUR 5,230 thousand (previous year: EUR 5,333 thousand) from other discontinued operations. Cash flow from investing activities of discontinued operations comprises cash flows in connection with operations sold in previous years.

Financial liabilities, the inflows and outflows of which appear in the cash flow statement under cash flow from financing activities, changed as follows in fiscal year 2019:

(EUR thousand)	Balance at 1/1/2019	Cash flow from financing activities	Changes in consolidated group	Exchange rate differences	Changes in fair value	**Other changes***	Balance at 12/31/2019
Bonds and debentures issued	249,569	–	–	–	–	**84**	249,653
Finance loans	51,294	–362	–	–13	–	**–**	50,919
Lease Liabilities	4,160	–	–1,022	661	–	**119,467**	123,266
Noncurrent financial liabilities	**305,023**	**–362**	**–1,022**	**648**	**–**	**119,551**	**423,838**
Bonds and debentures issued	2,143	–	–	–	–	**–**	2,143
Finance loans	17,523	6,240	–359	350	–	**–121**	23,633
Lease Liabilities	2,235	–63,483	–290	192	–	**120,234**	58,888
Current financial liabilities	**21,901**	**–57,243**	**–649**	**542**	**–**	**120,113**	**84,664**
Interest rate swap and forward exchange contracts used for hedging - liabilities	–	–	–	–	–	**–**	–
Total	**326,924**	**–57,605**	**–1,671**	**1,190**	**–**	**239,664**	**508,502**

*) Including EUR 121,932 thousand in noncurrent and EUR 58,390 thousand in current financial liabilities due to initial application of IFRS 16

(EUR thousand)	Balance at 1/1/2018	Cash flow from financing activities	Changes in consolidated group	Exchange rate differences	Changes in fair value	**Other changes**	Balance at 12/31/2018
Bonds and debentures issued	–	249,500	–	–	–	**69**	249,569
Finance loans	2,908	48,791	–	–605	–	**200**	51,294
Liabilities from finance leases	2,990	–2,912	–	45	–	**4,037**	4,160
Noncurrent financial liabilities	**5,898**	**295,379**	**–**	**–560**	**–**	**4,306**	**305,023**
Bonds and debentures issued	–	–	–	–	–	**2,143**	2,143
Finance loans	242,241	–221,680	121	–825		**–2,334**	17,523
Liabilities from finance leases	3,571	–1,365	–	29	–	**–**	2,235
Current financial liabilities	**245,812**	**–223,045**	**121**	**–796**	**–**	**–191**	**21,901**
Interest rate swap and forward exchange contracts used for hedging - liabilities	–	–	–	–	–	**–**	–
Total	**251,710**	**72,334**	**121**	**–1,356**	**–**	**4,115**	**326,924**

In the table shown, financial liabilities do not include the liabilities from derivatives of EUR 5,513 thousand (previous year: EUR 6,793 thousand), as the resulting cash flows are allocated to cash flow from operating activities.

10.2 Government grants

Government grants related to income amounting to EUR 1,168 thousand were received in fiscal year 2019 (previous year: EUR 1,370 thousand). Grants related to assets of EUR 243 thousand (previous year: EUR 586 thousand) were deducted from the carrying amounts of the assets concerned. In fiscal year 2019, expenses of EUR 290 thousand (previous year: EUR 405 thousand) were incurred for the potential repayment of grants received.

10.3 Related party disclosures

10.3.1 Related party transactions

Transactions between GEA Group Aktiengesellschaft and its consolidated subsidiaries have been eliminated in the course of consolidation. Revenue and expenses from transactions between continuing and discontinued operations were not eliminated if they will continue to be incurred following the disposal of the discontinued operation.

Transactions with unconsolidated subsidiaries and joint ventures mainly relate to regular deliveries of goods and services. Income and expenses from transactions between the group as a whole and these companies are composed of the following items:

(EUR thousand)	Revenue	Other income	Other expenses
01/01/2019 - 12/31/2019			
Unconsolidated subsidiaries	33,116	1,457	11,978
Joint ventures	11,089	–	–
Total	**44,205**	**1,457**	**11,978**
01/01/2018 - 12/31/2018			
Unconsolidated subsidiaries	43,152	1,489	8,090
Joint ventures	17,354	–	–
Total	**60,506**	**1,489**	**8,090**

Related party transactions resulted in the following outstanding items in the group as a whole as of December 31, 2019:

(EUR thousand)	Trade receivables	Trade payables	Other receivables	Other liabilities
12/31/2019				
Unconsolidated subsidiaries	13,890	689	8,861	31,404
Joint ventures	2,378	–	–	–
Total	**16,268**	**689**	**8,861**	**31,404**
thereof current	16,268	689	8,452	31,204
12/31/2018				
Unconsolidated subsidiaries	20,925	2,064	13,639	29,644
Joint ventures	5,539	–	–	–
Total	**26,464**	**2,064**	**13,639**	**29,644**
thereof current	26,464	2,064	12,939	29,444

In the reporting year, impairment losses on other receivables from unconsolidated subsidiaries of EUR 2,646 thousand (previous year: EUR 0 thousand) were recognized.

The outstanding amounts will be settled by bank transfer and are unsecured.

10.3.2 Remuneration of the Executive Board and the Supervisory Board

The Executive Board and Supervisory Board of GEA Group Aktiengesellschaft received total remuneration of EUR 18,436 thousand in fiscal year 2019 (previous year: EUR 11,940 thousand). This amount comprised the following elements:

(EUR thousand)	2019	2018
Short-term employee benefits	8,880	7,906
Post-employment benefits	1,717	1,615
Termination benefits	3,805	2,864
Share-based payments	4,034	–445
Total	**18,436**	**11,940**

Former Executive Board members and their surviving dependents received remuneration from GEA amounting to EUR 11,377 thousand (previous year: EUR 4,623 thousand). Of this, EUR 4,708 thousand (previous year: EUR 4,632 thousand) was attributable to pension payments and EUR 6,669 thousand (previous year: EUR 0 thousand) to severance payments for members of the Executive Board who left the company during the fiscal year. For more information, see the remuneration report on page 102 ff. Pension provisions in accordance with IFRSs were recognized for former Executive Board members and their surviving dependents in the amount of EUR 100,697 thousand (previous year: EUR 82,945 thousand). EUR 17,033 thousand of this amount (previous year: EUR 0 thousand) is attributable to members of the Executive Board who left the company during the fiscal year.

During the year under review, the expenses incurred for the Supervisory Board amounted to EUR 1,389 thousand (previous year: EUR 1,276 thousand).

Other information on the remuneration of the Executive Board and the Supervisory Board can be found in the remuneration report.

There were no other transactions by members of the Executive Board or Supervisory Board or their related parties in either the reporting or the comparative period.

11. Events after the End of the Reporting Period

In June 2019, the Executive Board of GEA Group Aktiengesellschaft announced that as of January 1, 2020, the group would be organized into five divisions, namely Separation & Flow Technologies, Liquid & Powder Technologies, Food & Healthcare Technologies, Farm Technologies and Refrigeration Technologies. The divisions are structured along similar lines of technology. For a detailed description of the various divisions, please refer to the section "Organization and structure" in the section of the management report entitled "Fundamental information about the group."

The change in control brought about by the reorganization and the resulting change in the composition of the cash-generating units with goodwill mean that goodwill has had to be reallocated to the new units (IAS 36.87). Impairment tests performed on the two cash-generating units with goodwill, namely Business Area Equipment and Business Area Solutions (excluding Pavan), prior to reorganization on January 1, 2020, did not identify any need for impairment.

On October 17, 2019, GEA announced that the Supervisory Board of GEA Group Aktiengesellschaft had appointed Johannes Giloth (49) to the company's Executive Board with effect from January 20, 2020. Mr. Giloth is responsible for the new executive mandate of procurement, production and supply chain. Johannes Giloth joined GEA from the telecommunications group Nokia, where he was Chief Procurement and Chief Supply Chain Officer for several years, successfully implementing projects to digitalize the group's procurement and supply-chain organizations.

On February 12, 2020, the Supervisory Board of GEA Group Aktiengesellschaft and Steffen Bersch (50), member of GEA's Executive Board, mutually agreed to terminate the latter's service agreement, which was due to expire on December 31, 2021. In doing so, the Board complied with Mr. Bersch's wish to terminate his contract so that he could devote himself to new tasks outside GEA. Due to this development, GEA's Executive Board will now comprise only three members. As of March 1, 2020, these will be Chairman and CEO Stefan Klebert, CFO Marcus A. Ketter, and Chief Operating Officer Johannes Giloth.

Overall economic developments – particularly in the Asia Pacific region and, according to the latest information, in Europe as well – can be compromised by the coronavirus (Covid-19), which has been spreading quickly since the start of 2020. Even if the extent of its effects cannot be reliably quantified at this time, negative repercussions on GEA's business activity above and beyond those already considered in the Outlook for 2020 are currently considered possible. The consequence would be an additional negative impact on earnings.

12. Supplemental Disclosures in Accordance with Section 315e of the HGB

12.1 Declaration on the Corporate Governance Code

The Executive Board and the Supervisory Board issued an updated declaration of conformity in accordance with section 161 of the Aktiengesetz (AktG – German Stock Corporation Act) on December 19, 2019, and made it permanently available to the shareholders on the company's website.

12.2 Number of employees

The average number of employees during the year was as follows:

Average number of employees during the year*	2019	2018
DACH & Eastern Europe	6,871	6,646
North & Central Europe	3,116	3,009
Asia Pacific	3,068	2,987
Western Europe, Middle East & Africa	3,404	3,442
North America	1,758	1,801
Latin America	513	500
Continuing operations	**18,730**	**18,385**
DACH & Eastern Europe	1	1
Discontinued operations	**1**	**1**
Total	**18,731**	**18,386**

*) Full-time equivalents (FTEs) excluding vocational trainees and inactive employment contracts

The number of employees at the reporting date was as follows:

Employees at reporting date*	2019	2018
DACH & Eastern Europe	6,861	6,765
North & Central Europe	3,072	3,056
Asia Pacific	3,092	3,049
Western Europe, Middle East & Africa	3,278	3,434
North America	1,675	1,821
Latin America	512	518
Continuing operations	**18,490**	**18,642**
DACH & Eastern Europe	1	1
Discontinued operations	**1**	**1**
Total	**18,491**	**18,643**

*) Full-time equivalents (FTEs) excluding vocational trainees and inactive employment contracts

12.3 Audit and consulting fees

The fees charged worldwide by the auditors of the consolidated financial statements, KPMG AG Wirtschaftsprüfungsgesellschaft, for fiscal year 2019 are broken down as follows:

(EUR thousand)	2019	2018
Audit	5,445	6,491
of which KPMG Wirtschaftsprüfungsgesellschaft AG	2,377	3,309
Other audit related services	186	78
of which KPMG Wirtschaftsprüfungsgesellschaft AG	186	78
Tax consulting services	211	790
of which KPMG Wirtschaftsprüfungsgesellschaft AG	–	144
Other services	94	9
of which KPMG Wirtschaftsprüfungsgesellschaft AG	90	9
Total	**5,936**	**7,368**
of which KPMG Wirtschaftsprüfungsgesellschaft AG	**2,653**	**3,540**

KPMG AG's audit fee mainly covers the auditing mandate for GEA Group Aktiengesellschaft's consolidated financial statements and annual financial statements.

Other assurance services relate to, for example, audits required by law or by contract such as EMIR audits pursuant to section 20 Wertpapierhandelsgesetz (WpHG – German Securities Trading Act) and covenant certification.

The other services largely relate to the recording and assessment of internal processes.

12.4 Investments

The following list shows all subsidiaries, associates, and joint ventures. With the exception of other equity investments within the meaning of section 313(2) No. 4 of the HGB, it does not contain investments in companies that GEA neither controls nor over which it can exercise significant influence.

	Head office	Shares %
Subsidiaries		
Argentina		
GEA Farm Technologies Argentina S.R.L.	Buenos Aires	100.00
GEA Process Engineering S.A.	Buenos Aires	100.00
GEA Westfalia Separator Argentina S.A.	Buenos Aires	100.00
Australia		
Dairy Technology Services Pty. Ltd.	Kyabram	100.00
GEA Australia Pty. Ltd.	Banksmeadow	100.00
GEA Farm Technologies Australia Pty. Ltd.	Thomastown	100.00
GEA Nu-Con Pty. Ltd.	Sutherland	100.00
GEA Process Engineering Pty. Ltd.	Blackburn	100.00
GEA Westfalia Separator Australia Pty. Ltd.	Thomastown	100.00
Belgium		
GEA Farm Technologies Belgium N.V.	Kontich	100.00
GEA Process Engineering N.V.	Halle	100.00
GEA Westfalia Separator Belgium N.V.	Kontich	100.00
Brazil		
GEA Equipamentos e Soluções Ltda.	Jaguariúna	100.00
Bulgaria		
GEA EEC Bulgaria EOOD	Sofia	100.00
Chile		
GEA Farm Technologies Chile SpA	Osorno	100.00
GEA Food Solutions Chile Comercializadora Ltda.	Santiago de Chile	100.00
GEA Process Engineering Chile S.A.	Santiago de Chile	100.00
GEA Westfalia Separator Chile S.A.	Santiago de Chile	100.00
Tecno-Leche S.A.	Osorno	100.00
China		
Beijing Tetra Laval Food Machinery Co., Ltd. i.L.	Beijing	90.00
BOS (Shanghai) Flow Equipment Co., Ltd.	Shanghai	100.00
Gbs Grain Machinery Manufacturing (Beijing) Co., Ltd.	Beijing	100.00
GEA (Shanghai) Farm Technologies Co., Ltd.	Shanghai	100.00
GEA Food Solutions (Beijing) Co., Ltd.	Beijing	100.00

	Head office	Shares %
GEA Food Solutions Asia Co., Ltd.	Hong Kong	100.00
GEA Hong Kong Trading Ltd.	Hong Kong	100.00
GEA Lyophil (Beijing) Ltd.	Beijing	100.00
GEA Mechanical Equipment (Tianjin) Co., Ltd.	Wuqing	100.00
GEA Process Engineering China Limited	Shanghai	100.00
GEA Process Engineering China Ltd.	Shanghai	100.00
GEA Process Engineering Trading (Shanghai) Ltd.	Shanghai	100.00
GEA Refrigeration Hong Kong Ltd.	Hong Kong	100.00
GEA Refrigeration Technology (Suzhou) Co., Ltd.	Suzhou	100.00
GEA Westfalia Separator (China) Ltd.	Hong Kong	100.00
GEA Westfalia Separator (Tianjin) Co., Ltd.	Tianjin	100.00
Shijiazhuang GEA Farm Technologies Co., Ltd.	Shijiazhuang	100.00
Denmark		
GEA Farm Technologies Mullerup A/S	Ullerslev	100.00
GEA Food Solutions Denmark A/S	Slagelse	100.00
GEA Food Solutions International A/S	Slagelse	100.00
GEA Food Solutions Nordic A/S	Slagelse	100.00
GEA Process Engineering A/S	Soeborg	100.00
GEA Refrigeration Components (Nordic) A/S	Skanderborg	100.00
GEA Scan-Vibro A/S	Svendborg	100.00
GEA Westfalia Separator DK A/S	Skanderborg	100.00
Germany		
"SEMENOWSKY VAL" Immobilien- Verwaltungs-GmbH	Düsseldorf	100.00
Brückenbau Plauen GmbH	Frankfurt/Main	100.00
GEA AWP GmbH	Prenzlau	100.00
GEA Beteiligungsgesellschaft I mbH	Düsseldorf	100.00
GEA Beteiligungsgesellschaft III mbH	Düsseldorf	100.00
GEA Bischoff GmbH	Essen	100.00
GEA Bock GmbH	Frickenhausen	100.00
GEA Brewery Systems GmbH	Kitzingen	100.00
GEA Diessel GmbH	Hildesheim	100.00
GEA Erste Kapitalbeteiligungen GmbH & Co. KG	Düsseldorf	100.00
GEA Farm Technologies GmbH	Bönen	100.00
GEA Food Solutions Germany GmbH	Biedenkopf-Wallau	100.00

	Head office	Shares %
GEA Germany GmbH	Oelde	100.00
GEA Group Holding GmbH	Düsseldorf	100.00
GEA Lyophil GmbH	Hürth	100.00
GEA Mechanical Equipment GmbH	Oelde	100.00
GEA Messo GmbH	Duisburg	100.00
GEA Real Estate GmbH	Frankfurt/Main	100.00
GEA Refrigeration Germany GmbH	Berlin	100.00
GEA Refrigeration Technologies GmbH	Düsseldorf	100.00
GEA Segment Management Holding GmbH	Düsseldorf	100.00
GEA TDS GmbH	Sarstedt	100.00
GEA Tuchenhagen GmbH	Büchen	100.00
GEA Verwaltungs AG	Düsseldorf	100.00
GEA Westfalia Separator Group GmbH	Oelde	100.00
GEA Wiegand GmbH	Ettlingen	100.00
Kupferbergbau Stadtberge zu Niedermarsberg GmbH i.L.	Lennestadt	100.00
LL Plant Engineering AG	Lennestadt	100.00
mg Altersversorgung GmbH	Düsseldorf	100.00
mg capital gmbh	Düsseldorf	100.00
MG Stahlhandel GmbH	Düsseldorf	100.00
Paul Pollrich GmbH	Düsseldorf	100.00
Ruhr-Zink GmbH	Frankfurt/Main	100.00
Sachtleben Bergbau Verwaltungsgesellschaft mit beschränkter Haftung	Lennestadt	100.00
Trennschmelz Altersversorgung GmbH	Düsseldorf	100.00
Twiste Copper GmbH	Lennestadt	100.00
VDM-Hilfe GmbH	Frankfurt/Main	100.00
ZiAG Plant Engineering GmbH	Frankfurt/Main	100.00
Finland		
GEA Finland Oy	Helsinki	100.00
France		
GEA Farm Technologies France SAS	Château-Thierry	100.00
GEA Farm Technologies Japy SAS	Saint-Apollinaire	100.00
GEA Food Solutions France SAS	Beaucouzé	100.00
GEA Group Holding France SAS	Montigny le Bretonneux	100.00

	Head office	Shares %
GEA Process Engineering SAS	Saint-Quentin en Yvelines Cedex	100.00
GEA Refrigeration France SAS	Les Sorinières	100.00
GEA Tuchenhagen France	Hoenheim	100.00
GEA Westfalia Separator France	Château-Thierry	100.00
Greece		
GEA Westfalia Separator Hellas A.E.	Athens	100.00
Great Britain		
Breconcherry Ltd.	Bromyard	100.00
Dixie-Union (UK) Ltd.	Milton Keynes	100.00
GEA Barr-Rosin Ltd.	Maidenhead	100.00
GEA Eurotek Ltd.	Aylsham	100.00
GEA Farm Technologies (UK) Ltd.	Warminster	100.00
GEA Food Solutions UK & Ireland Ltd.	Milton Keynes	100.00
GEA Grenco Ltd.	Sittingbourne	100.00
GEA Group Holdings (UK) Ltd.	Eastleigh	100.00
GEA Mechanical Equipment UK Ltd.	Milton Keynes	100.00
GEA Pharma Systems Ltd.	Eastleigh	100.00
GEA Process Engineering Ltd.	Birchwood,Cheshire	100.00
GEA Refrigeration Components (UK) Ltd.	Ross-on-Wye	100.00
GEA Refrigeration UK Ltd.	London	100.00
Milfos UK Ltd.	Droitwich	100.00
Wolfking Ltd.	Milton Keynes	100.00
India		
GEA Process Engineering (India) Pvt. Ltd.*	Vadodara	100.00
GEA Refrigeration India Pvt. Ltd.	Vadodara	100.00
GEA Westfalia Separator India Pvt. Ltd.*	Vadodara	100.00
LL Plant Engineering (India) Pvt. Ltd.	Mumbai Maharashtra	100.00
Indonesia		
GEA Westfalia Separator Indonesia, PT	Jakarta	100.00
PT. GEA Refrigeration Indonesia	Jakarta	100.00
Ireland		
GEA Farm Technologies (Ireland) Ltd.	Carrigtwohill	100.00
GEA Ireland Ltd.	Kildare	100.00

	Head office	Shares %
GEA Process Technologies Ireland Ltd.	Kildare	100.00
GEA Refrigeration Ireland Ltd.	Cavan	100.00
GEA Westfalia Separator Ireland Ltd.	Ballincollig	100.00
Iceland		
GEA Iceland ehf.	Reykjavik	100.00
Italy		
CMT Costruzioni Meccaniche e Tecnologia S.p.A	Peveragno	100.00
GEA COMAS S.p.A.	Torrebelvicino	100.00
GEA Food Solutions Italy S.r.l.	Osio Sopra	100.00
GEA Imaforni S.p.A	Colognola ai Colli	100.00
GEA Mechanical Equipment Italia S.p.A.	Parma	100.00
GEA Process Engineering S.p.A.	Osio Sopra	100.00
GEA Procomac S.p.A.	Sala Baganza	100.00
GEA Refrigeration Italy S.p.A.	Castel Maggiore	100.00
Golfetto Sangati S.r.l.	Galliera Veneta	100.00
Pavan S.p.A.	Galliera Veneta	100.00
Pelacci S.R.L. i.L.	Sala Baganza	67.00
Veneta Alimenti Innovativi S.r.l.	Pieve D'Alpago	100.00
Japan		
GEA Process Engineering Japan Ltd.	Tokyo	100.00
GEA Westfalia Separator Japan K.K.	Tokyo	100.00
Canada		
GEA Farm Technologies Canada Inc.	Drummondville	100.00
GEA Canada Inc.	Saint John	100.00
GEA Refrigeration Canada Inc.	Richmond	100.00
Colombia		
GEA Andina S.A.S.	Bogotá	100.00
Croatia		
GEA Farm Technologies Croatia d.o.o.	Zagreb	100.00
Lithuania		
GEA Baltics UAB	Vilnius	100.00

	Head office	Shares %
Malaysia		
GEA Refrigeration Malaysia Sdn. Bhd.	Petaling Jaya	100.00
GEA Westfalia Separator (Malaysia) Sdn. Bhd.	Shah Alam	100.00
Mexico		
Convenience Food Systems S.A. de C.V.*	Mexico City	100.00
GEA Power Cooling de Mexico S. de R.L. de C.V.	Naucalpan de Juárez	100.00
GEA Process Engineering S.A. de C.V.	Mexico City	100.00
GEA Westfalia Separator Mexicana S.A. de C.V.	Cuernavaca	100.00
New Zealand		
Farmers Industries Ltd.	Mt. Maunganui South	100.00
GEA Avapac Ltd.	Hamilton	100.00
GEA Farm Technologies New Zealand Ltd.	Hamilton	100.00
GEA Milfos International Ltd.	Hamilton	100.00
GEA New Zealand Ltd.	Auckland	100.00
GEA Process Engineering Ltd.	Hamilton	100.00
Netherlands		
BOS Homogenisers B.V.	Hilversum	100.00
GEA Dutch Holding B.V.	s-Hertogenbosch	100.00
GEA Farm Technologies Nederland B.V.	Leeuwarden	100.00
GEA Food Solutions B.V.	Bakel	100.00
GEA Food Solutions Bakel B.V.	Bakel	100.00
GEA Food Solutions International B.V.	Bakel	100.00
GEA Food Solutions Weert B.V.	Weert	100.00
GEA Niro PT B.V.	s-Hertogenbosch	100.00
GEA Process Engineering Nederland B.V.	Deventer	100.00
GEA Refrigeration Netherlands N.V.	s-Hertogenbosch	100.00
GEA Westfalia Separator Nederland B.V.	Cuijk	100.00
GEA Westfalia Separator Nederland Services B.V.	Cuijk	100.00
KET Marine International B.V.	Zevenbergen	100.00
PMJ Products B.V.	Raamsdonksveer	100.00
Royal de Boer Stalinrichtingen B.V.	Leeuwarden	100.00
Tullp B.V.	Raamsdonksveer	100.00

	Head office	Shares %
Nigeria		
GEA West Africa Ltd.	Lagos	100.00
Norway		
GEA Norway AS	Oslo	100.00
Austria		
GEA Austria GmbH	Plainfeld	100.00
GEA CEE GmbH	Vienna	100.00
Panama		
GEA Central America S.A.	Panama	100.00
Peru		
GEA Peruana SAC	Lima	100.00
Philippines		
GEA Pilipinas Inc.	Muntinlupa City	100.00
GEA Process Engineering (Philippines) Inc.	Muntinlupa City	100.00
GEA Westfalia Separator Phils. Inc.	Muntinlupa City	100.00
Poland		
GEA Farm Technologies Sp. z o.o.	Bydgoszcz	100.00
GEA Food Solutions Poland Sp. z o.o.	Warsaw	100.00
GEA Process Engineering Sp. z o.o.	Warsaw	100.00
GEA Refrigeration Poland Sp. z o.o.	Gdynia	100.00
GEA Tuchenhagen Polska sp. z o.o.	Koszalin	100.00
GEA Westfalia Separator Polska Sp. z o.o.	Warsaw	100.00
Rumania		
GEA Farm Technologies România S.R.L.	Alba Iulia	100.00
GEA Refrigeration Romania S.R.L.	Cluj-Napoca	100.00
GEA Westfalia Separator Romania S.R.L.	Cluj-Napoca	100.00
Russian Federation		
GEA Food Solutions RUS ZAO	Moscow	100.00
OOO GEA Farm Technologies Rus	Moscow	100.00
OOO GEA Refrigeration RUS	Moscow	100.00
Wilarus OOO	Kolomna	100.00

	Head office	Shares %
Saudi Arabia		
GEA Arabia Ltd.	Riyadh	100.00
Sweden		
GEA Exergy AB	Mölndal	100.00
GEA Sweden AB	Mölndal	100.00
Switzerland		
GEA Aseptomag AG	Kirchberg	100.00
GEA Aseptomag Holding AG	Kirchberg	100.00
GEA Food Solutions Switzerland AG	Rothrist	100.00
GEA mts flowtec AG	Kirchberg	100.00
GEA Suisse AG	Kirchberg	100.00
GEA Systems Suisse AG	Liestal	100.00
Serbia		
GEA EEC Serbia d.o.o. Beograd (Zemun)	Belgrade	100.00
Singapore		
GEA Process Engineering Pte. Ltd.	Singapore	100.00
GEA Refrigeration Singapore Pte. Ltd.	Singapore	100.00
GEA Westfalia Separator (S.E.A.) PTE. LTD.	Singapore	100.00
KET Marine Asia Pte. Ltd.	Singapore	100.00
Slovakia		
GEA Farm Technologies Slovakia spol. s.r.o.	Piestany	100.00
Slovenia		
GEA Vipoll, Oprema za industrijo tekočin d.o.o.	Križevci pri Ljutomeru	100.00
Spain		
GEA Farm Technologies Ibérica S.L.	Alcobendas	100.00
GEA Process Engineering S.A.	Alcobendas	100.00
GEA Refrigeration Ibérica S.A.	Alcobendas	100.00
GEA Westfalia Separator Ibérica, S.A.	Alcobendas	100.00
South Africa		
GEA Africa (Pty) Ltd.	Midrand	100.00

	Head office	Shares %
South Korea		
GEA Korea Ltd.	Seoul	100.00
Taiwan		
GEA Process Engineering Taiwan Ltd.	Taipeh	100.00
Thailand		
CFS Asia Ltd. i.L.	Bangkok	99.9998
GEA (Thailand) Co., Ltd.	Bangkok	99.9994
GEA Process Engineering (Thailand) Co., Ltd.	Bangkok	100.00
GEA Westfalia Separator (Thailand) Ltd.	Bangkok	97.30
Czech Republic		
GEA Bock Czech s.r.o.	Stribro	100.00
GEA Czech Republic s.r.o.	Prague	100.00
GEA Food Solutions Czech s.r.o.	Prague	100.00
GEA Westfalia Separator CZ s.r.o.	Prague	100.00
Turkey		
GEA Farm Technologies Tarim Ekip.Mak.Kim. Tek.Dan.San.Tic.Ltd.Sti.	Izmir	100.00
GEA PROCESS MÜHENDISLIK MAKINE INSAAT TAAHÜT ITHALAT IHRACAT DANIS. SAN. VE TIC. LTD. STI.	Izmir	100.00
GEA Westfalia Separator Sanayi ve Ticaret Ltd. Sti.	Izmir	100.00
Ukraine		
DE GEA Westfalia Separator Ukraine	Kiev	100.00
GEA Food Solutions Ukraine LLC i.L.	Kiev	100.00
GEA Grasso TOV	Kiev	100.00
TOV GEA Ukraine	Bila Zerkva	100.00
Hungary		
GEA Process Engineering CEE Kft.	Budaörs	100.00
Uruguay		
Balterin S.A.	Montevideo	100.00
Crismil S.A.	Montevideo	100.00
U.S.		
GEA Farm Technologies, Inc.	Naperville	100.00
GEA Food Solutions North America, Inc.	Frisco	100.00
GEA Mechanical Equipment US, Inc.	Northvale	100.00

	Head office	Shares %
GEA North America, Inc.	Wilmington	100.00
GEA Systems North America LLC	Columbia	100.00
Niro Sterner, Inc.	Columbia	100.00
Pavan U.S.A., Inc.	Emigsville	100.00
United Arab Emirates		
GEA Middle East FZE	Dubai	100.00
PPME Middle East FZE i.L.	Dubai	100.00
Vietnam		
GEA Vietnam Co., Ltd.	Ho Chi Minh City	100.00

Accociated companies

Argentina		
IMAI S.A.	Buenos Aires	20.00

Joint Ventures

Germany		
Merton Wohnprojekt GmbH	Frankfurt am Main	50.00
Japan		
GEA ORION Farm Technologies Co., Ltd.	Nagano	49.00
United Arab Emirates		
GRADE Grasso Adearest Ltd.	Dubai	50.00
GRADE Refrigeration LLC	Sharjah	49.00

Other equity investments under section 313(2) no. 4 of the HGB

Brazil		
EPSA Empresa Paulista de Servicos Ambientais S.A.	Sao Paulo	47.50
Germany		
Bauverein Oelde GmbH	Oelde	35.50
India		
Indo Technofrigo Ltd. i.L.	Rajkot	49.00

*) These consolidated subsidiaries are included on the basis of interim financial statements as of December 31, 2019, as they have a different reporting date.

12.5 Companies exempted in accordance with sections 264(3) and 264b of the HGB

The following German companies are exempted from the duty to comply with the supplementary accounting, audit, and publication provisions applicable to corporations and certain partnerships in accordance with sections 264(3) and 264b of the HGB:

GEA AWP GmbH, Prenzlau
GEA Bischoff GmbH, Essen
GEA Bock GmbH, Frickenhausen
GEA Brewery Systems GmbH, Kitzingen
GEA Diessel GmbH, Hildesheim
GEA Erste Kapitalbeteiligungen GmbH & Co. KG, Düsseldorf
GEA Farm Technologies GmbH, Bönen
GEA Food Solutions Germany GmbH, Biedenkopf-Wallau
GEA Germany GmbH, Oelde
GEA Group Holding GmbH, Düsseldorf
GEA Lyophil GmbH, Hürth
GEA Mechanical Equipment GmbH, Oelde
GEA Messo GmbH, Duisburg
GEA Real Estate GmbH, Frankfurt am Main
GEA Brewery Systems GmbH, Kitzingen
GEA Refrigeration Technologies GmbH, Düsseldorf
GEA TDS GmbH, Sarstedt
GEA Tuchenhagen GmbH, Büchen
GEA Westfalia Separator Group GmbH, Oelde
GEA Wiegand GmbH, Ettlingen
LL Plant Engineering AG, Lennestadt
mg Altersversorgung GmbH, Düsseldorf
mg capital gmbh, Düsseldorf
Paul Pollrich GmbH, Düsseldorf
ZiAG Plant Engineering GmbH, Frankfurt am Main

Düsseldorf, March 12, 2020

The Executive Board

Stefan Klebert   Johannes Giloth   Marcus A. Ketter

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Report on the Audit of the Consolidated Financial Statements and of the Combined Group Management Report

Opinions

We have audited the consolidated financial statements of **GEA Group Aktiengesellschaft, Düsseldorf**, and its subsidiaries (the Group), which comprise the consolidated balance sheet as of December 31, 2019, the consolidated income statement, the consolidated statement of comprehensive income, the consolidated statement of changes in equity and the consolidated cash flow statement for the financial year from January 1, 2019, to December 31, 2019, and notes to the consolidated financial statements, including a summary of significant accounting policies. In addition, we have audited the combined group management report of GEA Group Aktiengesellschaft, Düsseldorf, for the financial year from January 1 to December 31, 2019. In accordance with German legal requirements, we have not audited the content of those components of the combined group management report specified in the "Other Information" section of our auditor's report.

In our opinion, on the basis of the knowledge obtained in the audit,

- the accompanying consolidated financial statements comply, in all material respects, with the IFRSs as adopted by the EU, and the additional requirements of German commercial law pursuant to Section 315e (1) HGB [Handelsgesetzbuch: German Commercial Code] and, in compliance with these requirements, give a true and fair view of the assets, liabilities, and financial position of the Group as of December 31, 2019, and of its financial performance for the financial year from January 1 to December 31, 2019, and
- the accompanying combined group management report as a whole provides an appropriate view of the Group's position. In all material respects, this combined group management report is consistent with the consolidated financial statements, complies with German legal requirements and appropriately presents the opportunities and risks of future development. Our opinion on the management report does not cover the content of those components of the combined group management report specified in the "Other Information" section of the auditor's report.

Pursuant to Section 322 (3) sentence 1 HGB, we declare that our audit has not led to any reservations relating to the legal compliance of the consolidated financial statements and of the combined group management report.

Basis for the Opinions

We conducted our audit of the consolidated financial statements and of the combined group management report in accordance with Section 317 HGB and EU Audit Regulation No. 537/2014 (referred to subsequently as "EU Audit Regulation") and in compliance with German Generally Accepted Standards for Financial Statement Audits promulgated by the Institut der Wirtschaftsprüfer [Institute of Public Auditors in Germany] (IDW). Our responsibilities under those requirements and principles are further described in the "Auditor's Responsibilities for the Audit of the Consolidated Financial Statements and of the Combined Group Management Report" section of our auditor's report. We are independent of the group entities in accordance with the requirements of European law and German commercial and professional law, and we have fulfilled our other German professional responsibilities in accordance with these requirements. In addition, in accordance with Article 10 (2) point (f) of the EU Audit Regulation, we declare that we have not provided non-audit services prohibited under Article 5 (1) of the EU Audit Regulation. We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our opinions on the consolidated financial statements and on the combined group management report.

Key Audit Matters in the Audit of the Consolidated Financial Statements

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the consolidated financial statements for the financial year from January 1 to December 31, 2019. These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon, we do not provide a separate opinion on these matters.

Reallocation of goodwill to the PAVAN cash-generating unit and impairment of CGU PAVAN's goodwill

Please refer to note 2.1 in the notes to the consolidated financial statements for more information on the accounting policies applied. Disclosures on the amount of goodwill, the assumptions made and the amount of impairment losses recognized are included in note 5.3 of the notes to the consolidated financial statements.

THE FINANCIAL STATEMENT RISK

The goodwill of CGU PAVAN was fully written down in the amount of EUR 247.6 million in 2019 as part of impairment testing pursuant to IAS 36.

CGU PAVAN has been monitored separately by the Executive Board since October 2019, following a corresponding change in the reporting structure. Therefore, the goodwill previously allocated to Business Area Equipment was allocated to CGU PAVAN as of October 1, 2019. The historical values from final purchase price allocation of PAVAN from 2018 were used as a benchmark for reallocation. Any need to recognize impairment losses were checked as part of annual impairment testing as of October 31, 2019. For this purpose, the carrying amount is compared to the recoverable amount of cash-generating unit PAVAN. If the carrying amount exceeds the recoverable amount, this indicates a requirement for impairment. The recoverable amount is the higher amount of fair value less costs of disposal and value in use of the cash-generating unit. The impairment test for goodwill is complex and based on a number of assumptions that require judgment. Such measurement is highly dependent upon – among other factors – the estimated future performance of business and earnings of CGU PAVAN for the next three years, the long-term growth rate and the cost of capital used and is therefore subject to considerable uncertainty.

In terms of reallocating part of the recognized goodwill to CGU PAVAN, there is the financial statement risk that the allocated portion of the overall goodwill recognized is incorrect and, thus, the starting point for testing goodwill for impairment is not suitable. Furthermore, there is the financial statement risk that the amount of the impairment loss relating to the goodwill of CGU PAVAN is not accurate.

OUR AUDIT APPROACH

When assessing the reallocation of goodwill to CGU PAVAN, we looked at whether the allocation was in line with the applicable IFRS rules. For this purpose, we assessed the appropriateness of the reallocation approach. Furthermore, we used the historical values from the purchase price allocation from the PAVAN acquisition to ensure that allocation of goodwill and, thus, its starting point were appropriate for impairment testing.

We obtained a detailed understanding of the business planning process during our audit. GEA has implemented controls to ensure business planning's appropriateness. We assessed the design and effectiveness of selected controls. With the involvement of our valuation experts for impairment testing of CGU PAVAN, we assessed the appropriateness of the Company's key assumptions and calculation methods. To this end, we discussed and validated with those responsible for planning the expected development of business and earnings as well as the assumed long-term growth rates. We also reconciled this information with other internally available forecasts and the budget prepared by the Executive Board and taken note of by the Supervisory Board. In addition, we assessed the consistency of assumptions with external market assessments.

We also confirmed the accuracy of the Company's previous forecasts by comparing the budgets of previous financial years with actual results and by analyzing deviations. We compared the assumptions and parameters underlying the cost of capital, in particular the risk-free rate, the market risk premium and the beta factor, with our own assumptions and publicly available data.

To ensure the computational accuracy of the valuation model used, we verified the Company's calculations on the basis of selected risk-based elements.

OUR OBSERVATIONS

The reallocation of goodwill due to reorganization of the reporting structure is appropriate. The valuation model used for impairment testing is appropriate and in line with applicable IFRS accounting policies. Furthermore, the measurement assumptions and parameters used are within an appropriate range and are reasonable.

Recognition of revenue from construction contracts

Please refer to the explanatory notes on ‚accounting policies' under note 2 for the accounting policies applied. Information on revenue from construction contracts can be found under note 7.1 in the notes to the consolidated financial statements. Information on the gross amount due from customers for contract work and the gross amount due to customers for contract work is provided under notes 5.8 and 6.6, respectively.

THE FINANCIAL STATEMENT RISK

In financial year 2019, revenue in the amount of EUR 1,972.8 million was generated from construction contracts. As of the December 31, 2019 reporting date, the gross amount due from customers for contract work (contract assets) was EUR 413.0 million and the gross amount due to customers for contract work (contract liabilities) was EUR 639.7 million.

Contract revenue and realized results of construction contracts, which are to be recognized over time according to IFRS 15.35, are recognized in accordance with the percentage of completion method pursuant to IFRS 15.B18 by reference to the stage of completion. The stage of completion is determined as the proportion that contract costs incurred for work performed to date bear to the estimated total contract costs (cost to cost method). When it is probable that total contract costs will exceed total contract revenue, this loss is to be recognized as a provision for onerous contracts according to the rules set forth under IAS 37.

Determining the revenue from construction contracts that can be recognized is complex and requires estimates, especially with regard to the total contract cost to be estimated for establishing the stage of completion. The risk for the consolidated financial statements of GEA Group Aktiengesellschaft is that the revenue and realized results of construction contracts are inaccurately allocated to financial years or that onerous construction contracts are not recognized in time.

OUR AUDIT APPROACH

We assessed the procedure for estimating contract costs, the method for determining stage of completion as well as the design and establishment of controls to ensure proper planning of the entire contract costs.

We performed the following audit procedures for construction contracts specifically selected on the basis of risk (list not exhaustive):

- interviewing GEA staff involved in the project, including on estimates of the overall contract costs, risks involved and status of the projects
- reconciling the actual cost allocated to the contracts with internal cost schedules and external documents
- critical review of assumptions used for estimates of total contract costs, also by analyzing project progress to date and any deviations from the budget
- assessment of the computational accuracy of the stage of completion determined as well as any losses anticipated and also the proper accounting treatment of construction contracts and possible provisions for onerous contracts under IAS 37.

OUR OBSERVATIONS

GEA's accounting treatment of construction contracts and the corresponding provisions for onerous contracts is appropriate. The assumptions underlying the accounting for long-term production orders are appropriate overall.

Impairment of trade receivables

Please refer to the explanatory notes on "accounting policies" under note 2 for the accounting policies applied. Information on trade receivables can be found under note 5.9 in the notes to the consolidated financial statements.

THE FINANCIAL STATEMENT RISK

Trade receivables from third parties in the amount of EUR 898.8 million were reported in the consolidated financial statements of GEA Group Aktiengesellschaft as of December 31, 2019. Trade receivables from third parties that are past due amounted to EUR 282.0 million as of December 31, 2019, of which EUR 18.9 million was overdue by more than 360 days.

The recoverability of trade receivables is assessed on a collective basis based on debtors of the same type and on an individual basis based on individual debtors. Both prior experience with this portfolio and foreseeable future developments are taken into account in the collective assessment of expected losses for portfolios of risks of the same type. If past due receivables, financial and economic difficulties at the customer or actual and expected defaults on payment have occurred, the assessment of expected losses is carried out on the basis of the individual debtor. For the assessment of expected losses from individual debtors all credit risk-relevant information is evaluated on an individual basis, resulting in a corresponding impairment loss being recognized. If the receivable is no longer expected to be collectible in its entirety, the receivables and impairment losses are derecognized. The assessment of the similar type of debtors, the interpretation of indicators on future development and estimates of the default amount for individual debtors require judgment and are subject to a series of assumptions regarding customer solvency. The risk for the consolidated financial statements of GEA is that the impairment of trade receivables from third parties is recognized too late or not in the amount necessary.

OUR AUDIT APPROACH

We evaluated the process for monitoring past due trade receivables as well as the adequacy of implemented controls to ensure proper recognition of impairment losses. To this end, we verified for example that controls are in place enabling group entities to regularly identify and continuously monitor past due receivables.

We critically reviewed the impairment of a selection of past due trade receivables selected on the basis of risk and volume. For this purpose, we analyzed the development of past due receivables and impairment losses over the course of the year, compared them to historical experience with the debtors concerned, queried the responsible GEA staff regarding impairment and assessed internal as well as external documentation, such as correspondence between the Company and customers.

OUR OBSERVATIONS

The assumptions and estimates to assess the impairment of trade receivables are appropriate overall.

Other Information

Management and/or the Supervisory Board are/is responsible for the other information. The other information comprises:

- the components of the non-financial statement, which are marked as unaudited
- the corporate governance report including the corporate governance statement, and
- information extraneous to the combined group management report and marked as unaudited.

The other information also includes the remaining parts of the annual report.

The other information does not include the consolidated financial statements, the combined group management report information audited for content and our auditor's report thereon. Our opinions on the consolidated financial statements and on the combined group management report do not cover the other information, and consequently we do not express an opinion or any other form of assurance conclusion thereon.

In connection with our audit, our responsibility is to read the other information and, in so doing, to consider whether the other information

- is materially inconsistent with the consolidated financial statements, with the group management report information audited for content or our knowledge obtained in the audit, or
- otherwise appears to be materially misstated.

In accordance with our engagement letter, we conducted a separate assurance engagement of the non-financial statement. Please refer to our assurance report dated March 12, 2020, for information on the nature, scope and findings of this assurance engagement.

Responsibilities of Management and the Supervisory Board for the Consolidated Financial Statements and the Combined Group Management Report

Management is responsible for the preparation of consolidated financial statements that comply, in all material respects, with IFRSs as adopted by the EU and the additional requirements of German commercial law pursuant to Section 315e (1) HGB and that the consolidated financial statements, in compliance with these requirements, give a true and fair view of the Group's assets, liabilities, financial position and financial performance. In addition, management is responsible for such internal control as they have determined necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management is responsible for assessing the Group's ability to continue as a going concern. They also have the responsibility for disclosing, as applicable, matters related to going concern. In addition, they are responsible for financial reporting based on the going concern basis of accounting unless there is an intention to liquidate the Group or to cease operations, or there is no realistic alternative but to do so.

Furthermore, management is responsible for the preparation of the combined group management report that, as a whole, provides an appropriate view of the Group's position and is, in all material respects, consistent with the consolidated financial statements, complies with German legal requirements, and appropriately presents the opportunities and risks of future development. In addition, management is responsible for such arrangements and measures (systems) as they have considered necessary to enable the preparation of a combined group management report that is in accordance with the applicable German legal requirements, and to be able to provide sufficient appropriate evidence for the assertions in the combined group management report.

The Supervisory Board is responsible for overseeing the Group's financial reporting process for the preparation of the consolidated financial statements and of the combined group management report.

Auditor's Responsibilities for the Audit of the Consolidated Financial Statements and of the Combined Group Management Report

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and whether the combined group management report as a whole provides an appropriate view of the Group's position and, in all material respects, is consistent with the consolidated financial statements and the knowledge obtained in the audit, complies with the German legal requirements and appropriately presents the opportunities and risks of future development, as well as to issue an auditor's report that includes our opinions on the consolidated financial statements and on the combined group management report.

Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Section 317 HGB and the EU Audit Regulation and in compliance with German Generally Accepted Standards for Financial Statement Audits promulgated by the Institut der Wirtschaftsprüfer (IDW) will always detect a material misstatement. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements and this combined group management report.

We exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements and of the combined group management report, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinions. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal controls.
- Obtain an understanding of internal control relevant to the audit of the consolidated financial statements and of arrangements and measures (systems) relevant to the audit of the combined group management report in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of these systems.
- Evaluate the appropriateness of accounting policies used by management and the reasonableness of estimates made by management and related disclosures.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in the auditor's report to the related disclosures in the consolidated financial statements and in the combined group management report or, if such disclosures are inadequate, to modify our respective opinions. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the group to cease to be able to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements present the underlying transactions and events in a manner that the consolidated financial statements give a true and fair view of the assets, liabilities, financial position and financial performance of the group in compliance with IFRSs as adopted by the EU and the additional requirements of German commercial law pursuant to Section 315e (1) HGB.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express opinions on the consolidated financial statements and on the combined group management report. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our opinions.
- Evaluate the consistency of the combined group management report with the consolidated financial statements, its conformity with [German] law, and the view of the Group's position it provides.
- Perform audit procedures on the prospective information presented by management in the combined group management report. On the basis of sufficient appropriate audit evidence we evaluate, in particular, the significant assumptions used by management as a basis for the prospective information, and evaluate the proper derivation of the prospective information from these assumptions. We do not express a separate opinion on the prospective information and on the assumptions used as a basis. There is a substantial unavoidable risk that future events will differ materially from the prospective information.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide those charged with governance with a statement that we have complied with the relevant independence requirements, and communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, the related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the consolidated financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter.

Other Legal and Regulatory Requirements

Further Information pursuant to Article 10 of the EU Audit Regulation

We were elected as group auditor at the annual general meeting on April 26, 2019. We were engaged by the Supervisory Board on October 24, 2019. We have been the group auditor of GEA Group Aktiengesellschaft, Düsseldorf, without interruption since financial year 2011.

We declare that the opinions expressed in this auditor's report are consistent with the additional report to the Audit Committee pursuant to Article 11 of the EU Audit Regulation (long-form audit report).

German Public Auditor Responsible for the Engagement

The German Public Auditor responsible for the engagement is Michael Jessen.

Düsseldorf, March 12, 2020

KPMG AG
Wirtschaftsprüfungsgesellschaft

[signature] Lurweg
Wirtschaftsprüfer
[German Public Auditor]

[signature] Jessen
Wirtschaftsprüfer
[German Public Auditor]

Limited Assurance Report of the Independent Auditor regarding the Combined Non-financial Statement

To the Supervisory Board of GEA Group Aktiengesellschaft, Düsseldorf

We have performed an independent limited assurance engagement on the combined non-financial statement of GEA Group Aktiengesellschaft, Düsseldorf (further "GEA") and the group as well as the by reference qualified parts "Fundamental Information about the Group" (further: "Report") according to Sections 315b and 315c in conjunction with 289b to 289e German Commercial Code (HGB) for the business year from January 1 to December 31, 2019.

Management's Responsibility

The legal representatives of GEA are responsible for the preparation of the Report in accordance with Sections 315b and 315c in conjunction with 289b to 289e HGB.

This responsibility of the legal representatives includes the selection and application of appropriate methods to prepare the Report and the use of assumptions and estimates for individual disclosures which are reasonable under the given circumstances. Furthermore, this responsibility includes designing, implementing and maintaining systems and processes relevant for the preparation of the Report in a way that is free of – intended or unintended – material misstatements.

Independence and quality assurance on the part of the auditing firm

We are independent from the entity in accordance with the requirements of independence and quality assurance set out in legal provisions and professional pronouncements and have fulfilled our additional professional obligations in accordance with these requirements.

Our audit firm applies the national statutory provisions and professional pronouncements for quality assurance, in particular the Professional Code for German Public Auditors and Chartered Accountants (in Germany) and the quality assurance standard of the German Institute of Public Auditors (Institut der Wirtschaftsprüfer, IDW) regarding quality assurance requirements in audit practice (IDW QS 1).

Practitioner's Responsibility

Our responsibility is to express a conclusion on the Report based on our work performed within our limited assurance engagement.

We conducted our work in accordance with the International Standard on Assurance Engagements (ISAE) 3000 (Revised): "Assurance Engagements other than Audits or Reviews of Historical Financial Information" published by IAASB. This Standard requires that we plan and perform the assurance engagement to obtain limited assurance whether any matters have come to our attention that cause us to believe that the Report of the entity for the business year January 1 to December 31, 2019 has not been prepared, in all material respects, in accordance with Sections 315b and 315c in conjunction with 289b to 289e HGB. We do not, however, provide a separate conclusion for each disclosure. In a limited assurance engagement the evidence gathering procedures are more limited than in a reasonable assurance engagement and therefore significantly less assurance is obtained than in a reasonable assurance engagement. The choice of audit procedures is subject to the auditor's own judgement.

Within the scope of our engagement, we performed amongst others the following assurance procedures:

- Inquiries of personnel on corporate level, who are responsible for the materiality analysis, in order to gain an understanding of the processes for determining material sustainability topics and respective reporting boundaries of GEA
- A risk analysis, including a media search, to identify relevant information on GEA sustainability performance in the reporting period
- Evaluation of the design and implementation of the systems and processes for determining, processing and monitoring disclosures relating to environmental, employee and social matters, respect for human rights, and combating corruption and bribery, including the consolidation of the data
- Inquiries of personnel on corporate level who are responsible for determining disclosures on concepts, due diligence processes, results and risks, for conducting internal controls and consolidation of the disclosures
- Reviewing the suitability of internally developed Reporting Criteria
- Evaluation of selected internal and external documentation
- Analytical evaluation of data and trends of quantitative information which are reported by all sites for consolidation on corporate level
- Evaluation of local data collection, validation and reporting processes as well as the reliability of reported data based on a sample of the sites in Shanghai and Tianjin (both China)
- Assessment of the overall presentation of the disclosures

Conclusion

Based on the procedures performed and the evidence obtained, nothing has come to our attention that causes us to believe that the Report of for GEA the business year from January 1 to December 31, 2019 is not prepared, in all material respects, in accordance with Sections 315b and 315c in conjunction with 289b to 289e HGB.

Restriction of Use/Clause on General Engagement Terms

This report is issued for purposes of the Supervisory Board of GEA Group Aktiengesellschaft, Düsseldorf only. We assume no responsibility with regard to any third parties.

Our assignment for the Supervisory Board of GEA Group Aktiengesellschaft, Düsseldorf and professional liability is governed by the General Engagement Terms for Wirtschaftsprüfer and Wirtschaftsprüfungsgesellschaften (Allgemeine Auftragsbedingungen für Wirtschaftsprüfer und Wirtschaftsprüfungsgesellschaften) in the version dated January 1, 2017 (Appendix 2). By reading and using the information contained in this report, each recipient confirms notice of provisions of the General Engagement Terms (including the limitation of our liability for negligence to EUR 4 million as stipulated in No. 9) and accepts the validity of the General Engagement Terms with respect to us.

Munich, March 12, 2020

KPMG AG
Wirtschaftsprüfungsgesellschaft
[Original German version signed by:]

Hell ppa. Dietrich

Responsibility Statement

To the best of our knowledge, and in accordance with the applicable reporting principles, the consolidated financial statements give a true and fair view of the assets, liabilities, financial position, and profit or loss of the group, and the management report of the group, which has been combined with the management report of the Company, includes a fair review of the development and performance of the business and the position of the group, together with a description of the principal opportunities and risks associated with the expected development of the group.

Düsseldorf, March 12, 2020

Stefan Klebert | Johannes Giloth | Marcus A. Ketter

Corporate Bodies and their Mandates

Executive Board

Stefan Klebert, Düsseldorf/Germany, CEO – Chairman of the Executive Board (since February 18, 2019)

a) • GEA Farm Technologies GmbH, Bönen/Germany, Chairman of the Supervisory Board (since January 30, 2020)
• GEA Westfalia Separator Group GmbH, Oelde/Germany, Chairman of the Supervisory Board (since February 27, 2020)

b) • Hoberg & Driesch GmbH, Düsseldorf/Germany, Member of the Shareholders Committee
• Hoberg & Driesch GmbH & Co. KG Röhrengroßhandel/Hoberg and Driesch Beteiligungs GmbH, Düsseldorf/Germany, Member of the Advisory Boards
• Chiron Group SE, Tuttlingen/Germany, Member of the Board of Directors
• Chiron-Werke GmbH & Co. KG/Chiron-Werke Beteiligungsgesellschaft mbH, Tuttlingen/Germany, Member of the Advisory Boards

Jürg Oleas, Meerbusch/Germany, and Eich/Switzerland, CEO – Chairman of the Executive Board (until February 17, 2019)

a) • LL Plant Engineering AG, Lennestadt/Germany, Chairman of the Supervisory Board (until February 17, 2019)

b) • RUAG Holding AG, Bern/Switzerland, Member of the Board of Directors
• Lafarge Holcim Ltd., Jona/Switzerland, Member of the Board of Directors

Steffen Bersch, Münster/Germany, Member of the Executive Board (until February 29, 2020)

a) • Thyssen'sche Handelsgesellschaft m.b.H., Mülheim/Germany, Member of the Supervisory Board

Johannes Giloth, Neubiberg/Germany, Member of the Executive Board and COO (since January 20, 2020)

b) • Savi Technology Inc., Alexandria/VA/USA, Member of the Advisory Board

Marcus A. Ketter, Düsseldorf/Germany, CFO – Chief Financial Officer (since May 20, 2019)

Niels Erik Olsen, Hilleroed/Denmark, Member of the Executive Board (until March 13, 2019)

b) • GEA Process Engineering A/S, Søborg/Denmark, Chairman of the Supervisory Board (until March 13, 2019)
• Grundfos Holding A/S, Bjerringbro/Denmark, Member of the Board of Directors

Dr. Helmut Schmale, Bochum/Germany, CFO – Chief Financial Officer (until May 17, 2019)

a) • LL Plant Engineering AG, Lennestadt/Germany, Deputy Chairman of the Supervisory Board (until February 17, 2019)

Martine Snels, Kalmthout/Belgium, Mitglied des Vorstands (bis 31. Dezember 2019)

b) • Resilux NV, Wetteren/Belgium, Non-Executive Director (since May 17, 2019)
• Electrolux Professional AB, Sweden, Non-Executive Director (since November 27, 2019)

a) Membership of statutory German supervisory boards
b) Membership of comparable German or foreign supervisory bodies of business entities

Supervisory Board

Dr. Helmut Perlet, Munich/Germany, Chairman of the Supervisory Board of GEA Group Aktiengesellschaft

Kurt-Jürgen Löw, Ebernhahn/Germany, Deputy Chairman of the Supervisory Board, Chairman of the Works Council of GEA Group Aktiengesellschaft

a) • GEA Westfalia Separator Group GmbH, Oelde/Germany, Deputy Chairman of the Supervisory Board

Ahmad M. A. Bastaki, Safat/Kuwait, Executive Director, Planning and Senior Management der Kuwait Investment Authority

Hartmut Eberlein, Gehrden/Germany, Chairman of the Audit Committee of GEA Group Aktiengesellschaft

Rainer Gröbel, Sulzbach/Ts./Germany, Departmental Head, IG Metall, Management Board

a) • Schunk GmbH, Heuchelheim/Germany, Deputy Chairman of the Supervisory Board

Colin Hall, London/UK, Head of Investments of Groupe Bruxelles Lambert, Belgium, and CEO of Sienna Capital S.a.r.l.

b) • Imerys S.A., France, Member of the Board of Directors
- Parques Reunidos Centrales S.A., Spain, Member of the Board of Directors (until February 26, 2019)
- Umicore S.A., Belgium, Member of the Board of Directors (until April 25, 2019)
- Kartesia Management S.A., Luxembourg, Member of the Board of Directors (until July 1, 2019)
- Ergon Capital Partners S.A., Belgium, Member of the Board of Directors
- Ergon Capital Partners II SA., Belgium, Member of the Board of Directors
- LafargeHolcim, Switzerland, Member of the Board of Directors (since May 15, 2019)
- Marnix French ParentCo (Webhelp group), France, Member of the Supervisory Board (since November 19, 2019)

Michaela Hubert, Prichsenstadt/Germany, Chairman of the General Works Council of GEA Brewery Systems GmbH

Michael Kämpfert, Düsseldorf/Germany, Vice President HR DACH & EE of GEA Group Aktiengesellschaft

Eva-Maria Kerkemeier, Herne/Germany, 1. Authorized Representative of IG Metall Bochum-Herne, Germany

a) Membership of statutory German supervisory boards
b) Membership of comparable German or foreign supervisory bodies of business entities

Brigitte Krönchen, Oelde/Germany, Deputy Chairman of the Group Works Council of GEA Group Aktiengesellschaft

a) • GEA Farm Technologies GmbH, Bönen/Germany, Deputy Chairman of the Supervisory Board

Jean E. Spence, Marco Island/FL/USA, Management Consultant, President, JES Consulting LLC

b) • TreeHouse Foods, Inc., Oak Brook/IL/USA, Member of the Board of Directors

Dr. Molly P. Zhang, Aurora/CO/U.S.

b) • Cooper Standard Holdings Inc., Novi/MI/USA, Member of the Board of Directors
- XG Sciences, Inc., Lansing/MI/USA, Member of the Board of Directors
- Newmont Mining Corporation, Greenwood Village/CO/USA, Member of the Board of Directors (until June 31, 2019)
- Enerkem, Montreal/Canada, Member of the Board of Directors and Adviser (since March 27, 2019)

Supervisory Board committees of GEA Group Aktiengesellschaft (as of December 31, 2019)

Mediation Committee in accordance with section 27(3) of the Mitbestimmungsgesetz (MitbestG – German Co-determination Act)

Dr. Helmut Perlet, Chairman
Dr. Molly P. Zhang
Eva-Maria Kerkemeier
Kurt-Jürgen Löw

Presiding Committee

Dr. Helmut Perlet, Chairman
Ahmad M. A. Bastaki
Rainer Gröbel
Colin Hall
Michaela Hubert
Kurt-Jürgen Löw

Audit Committee

Hartmut Eberlein, Chairman (financial expert within the meaning of section 100(5) of the Aktiengesetz (AktG – German Stock Corporation Act))
Michael Kämpfert
Brigitte Krönchen
Dr. Helmut Perlet

Technology Committee (since May 1, 2019)

Dr. Molly P. Zhang, Chairwoman
Michaela Hubert
Brigitte Krönchen
Jean E. Spence

Nomination Committee

Dr. Helmut Perlet, Chairman
Ahmad M. A. Bastaki
Jean E. Spence

a) Membership of statutory German supervisory boards
b) Membership of comparable German or foreign supervisory bodies of business entities

Key Figures by Quarter

	Q1 2019	Q1 2018	Q2 2019	Q2 2018	Q3 2019	Q3 2018	Q4 2019	Q4 2018	2019	2018	2017
Order intake (EUR million)											
BA Equipment	683.0	701.4	660.5	688.3	672.3	623.9	674.5	648.9	2,690.3	2,662.4	2,491.5
BA Solutions	573.4	462.0	557.0	755.3	665.1	627.6	722.0	654.1	2,517.4	2,499.1	2,484.0
GEA[1]	**1,186.3**	**1,102.6**	**1,146.8**	**1,383.0**	**1,254.8**	**1,197.2**	**1,343.3**	**1,235.0**	**4,931.1**	**4,917.7**	**4,750.8**
Revenue (EUR million)											
BA Equipment	599.7	592.2	671.1	653.2	687.1	650.5	724.2	731.7	2,682.2	2,627.6	2,371.0
BA Solutions	518.8	504.0	642.4	633.4	614.2	598.0	687.1	705.7	2,462.5	2,441.1	2,441.6
GEA[1]	**1,057.3**	**1,039.4**	**1,247.3**	**1,227.0**	**1,234.7**	**1,188.9**	**1,340.4**	**1,372.9**	**4,879.7**	**4,828.2**	**4,604.5**
EBITDA (EUR million)											
BA Equipment	82.1	65.5	78.4	90.0	110.9	107.0	77.9	98.3	349.2	360.8	369.3
BA Solutions	–1.8	–0.2	27.3	37.3	46.5	32.3	20.5	49.6	92.4	119.0	151.7
GEA[1]	**69.3**	**57.3**	**101.1**	**122.6**	**138.5**	**120.8**	**65.5**	**130.5**	**374.4**	**431.2**	**498.5**
EBITDA before restructuring measures (EUR million)[2]											
BA Equipment	82.7	73.1	79.8	97.9	112.3	116.0	112.3	130.0	387.2	416.9	382.2
BA Solutions	–1.4	7.6	32.6	44.4	46.7	40.8	54.8	59.6	132.7	152.4	161.0
GEA[1]	**74.6**	**76.7**	**111.2**	**141.9**	**143.1**	**145.2**	**150.3**	**175.2**	**479.2**	**539.1**	**522.9**
EBITDA margin before restructuring measures (%)[2]											
BA Equipment	13.8	12.3	11.9	15.0	16.3	17.8	15.5	17.8	14.4	15.9	16.1
BA Solutions	–0.3	1.5	5.1	7.0	7.6	6.8	8.0	8.4	5.4	6.2	6.6
GEA[1]	**7.1**	**7.4**	**8.9**	**11.6**	**11.6**	**12.2**	**11.2**	**12.8**	**9.8**	**11.2**	**11.4**

1) Differences in the figures for the Group as a whole result from the figures not shown for Other/consolidation
2) Pro-forma figures for 2018 incl. IFRS 16 effects from 2019.

	Q1 2019	Q1 2018	Q2 2019	Q2 2018	Q3 2019	Q3 2018	Q4 2019	Q4 2018	2019	2018	2017
Order intake (EUR million)											
Separation & Flow Technologies	313.6	307.4	323.4	305.0	324.8	268.6	310.0	308.2	**1,271.8**	**1,189.2**	**1,153.2**
Liquid & Powder Technologies	409.7	297.4	365.3	516.9	504.8	427.8	548.7	382.1	**1,828.5**	**1,624.1**	**1,653.8**
Food & Healthcare Technologies	237.9	225.5	222.2	303.6	210.1	233.8	244.2	307.4	**914.4**	**1,070.3**	**849.2**
Farm Technologies	162.5	183.1	157.8	166.9	156.3	170.2	165.3	153.5	**641.8**	**673.6**	**685.0**
Refrigeration Technologies	154.3	169.9	197.7	209.7	175.5	195.7	179.5	223.3	**707.0**	**798.6**	**772.5**
GEA[1]	**1,186.3**	**1,102.6**	**1,146.8**	**1,383.0**	**1,254.8**	**1,197.2**	**1,343.3**	**1,235.0**	**4,931.1**	**4,917.7**	**4,750.8**
Revenue (EUR million)											
Separation & Flow Technologies	274.5	250.9	300.7	292.7	323.5	292.3	339.6	338.9	**1,238.3**	**1,174.8**	**1,100.0**
Liquid & Powder Technologies	362.0	345.8	445.2	433.9	437.8	403.1	484.0	462.4	**1,729.0**	**1,645.2**	**1,694.0**
Food & Healthcare Technologies	223.0	225.6	251.6	238.5	232.3	237.5	256.2	280.6	**963.0**	**982.2**	**759.2**
Farm Technologies	143.3	137.8	160.1	164.7	171.3	175.1	181.5	185.1	**656.3**	**662.7**	**643.5**
Refrigeration Technologies	149.4	167.2	189.5	195.1	173.4	185.4	192.5	230.3	**704.9**	**778.0**	**725.7**
GEA[1]	**1,057.3**	**1,039.4**	**1,247.3**	**1,227.0**	**1,234.7**	**1,188.9**	**1,340.4**	**1,372.9**	**4,879.7**	**4,828.2**	**4,604.5**
EBITDA (EUR million)											
Separation & Flow Technologies	57.2	40.0	44.9	54.1	73.7	72.3	55.0	51.4	**230.8**	**217.8**	**244.2**
Liquid & Powder Technologies	–7.7	–3.6	23.3	20.8	29.6	17.6	10.1	32.2	**55.3**	**67.0**	**105.6**
Food & Healthcare Technologies	19.4	12.9	12.1	19.0	16.0	17.2	9.3	24.1	**56.8**	**73.2**	**49.5**
Farm Technologies	5.9	6.0	12.8	12.3	18.4	17.0	8.3	24.1	**45.3**	**59.5**	**63.4**
Refrigeration Technologies	7.1	10.0	11.2	20.5	17.9	16.3	16.8	14.4	**53.1**	**61.2**	**61.4**
GEA[1]	**69.3**	**57.3**	**101.1**	**122.6**	**138.5**	**120.8**	**65.5**	**130.5**	**374.4**	**431.2**	**498.5**
EBITDA before restructuring measures (EUR million)[2]											
Separation & Flow Technologies	57.7	43.6	45.9	57.2	74.3	76.6	69.2	77.8	**247.1**	**255.2**	**253.8**
Liquid & Powder Technologies	–7.2	0.9	24.9	24.7	29.8	22.4	39.7	38.6	**87.2**	**86.6**	**113.2**
Food & Healthcare Technologies	19.4	15.1	12.1	21.6	16.0	19.5	19.3	26.2	**66.8**	**82.5**	**50.5**
Farm Technologies	6.1	8.2	13.2	15.1	19.3	19.9	21.7	27.7	**60.3**	**70.9**	**65.3**
Refrigeration Technologies	7.1	12.9	14.9	23.1	17.9	19.5	18.4	17.5	**58.3**	**73.0**	**63.4**
GEA[1]	**74.6**	**76.7**	**111.2**	**141.9**	**143.1**	**145.2**	**150.3**	**175.2**	**479.2**	**539.1**	**522.9**
EBITDA margin before restructuring measures (%)[2]											
Separation & Flow Technologies	21.0	17.4	15.3	19.5	23.0	26.2	20.4	22.9	**20.0**	**21.7**	**23.1**
Liquid & Powder Technologies	–2.0	0.2	5.6	5.7	6.8	5.6	8.2	8.4	**5.0**	**5.3**	**6.7**
Food & Healthcare Technologies	8.7	6.7	4.8	9.1	6.9	8.2	7.5	9.3	**6.9**	**8.4**	**6.7**
Farm Technologies	4.2	6.0	8.2	9.1	11.2	11.4	12.0	15.0	**9.2**	**10.7**	**10.2**
Refrigeration Technologies	4.8	7.7	7.9	11.8	10.3	10.5	9.5	7.6	**8.3**	**9.4**	**8.7**
GEA[1]	**7.1**	**7.4**	**8.9**	**11.6**	**11.6**	**12.2**	**11.2**	**12.8**	**9.8**	**11.2**	**11.4**

1) Differences in the figures for the Group as a whole result from the figures not shown for Other/consolidation
2) Pro-forma figures for 2018 incl. IFRS 16 effects from 2019.

GRI Content Index

GEA's sustainability report for fiscal year 2019 follows the international standards set by the Global Reporting Initiative (GRI). This report has been prepared in accordance with the GRI Standards: Core option. At the request of GEA's Supervisory Board, KPMG AG Wirtschaftsprü fungsgesellschaft reviewed GEA's combined non-financial consolidated statement for fiscal year 2019 and performed a limited assurance engagement in relation to the statutory information required pursuant to ss. 315b, 315c in conjunction with 289b to 289e HGB (Handelsgesetzbuch – German Commercial Code). This review was in line with the applicable "International Standard on Assurance Engagements" (ISAE) 3000 (Revised): "Assurance Engagements other than Audits or Reviews of Historical Financial Information," see disclosure 102-56.

GRI Standard	Disclosure	Page	Omission/comment
GRI 101: Foundation 2016			

General Disclosures

Organizational profile

GRI Standard	Disclosure		Page	Omission/comment
GRI 102: General Disclosures 2016	102-1	Name of the organization	36	
	102-2	Activities, brands, products, and services	13–23, 37 f.	
	102-3	Location of headquarters	298	
	102-4	Location of operations	51, 265 ff.	
	102-5	Ownership and legal form	32 f.	
	102-6	Markets served	7, 51, 56	
	102-7	Scale of the organization	51, 66	
	102-8	Information on employees and other workers	51	
	102-9	Supply chain	42 ff., 129 f., 145 f.	
	102-10	Significant changes to the organization and its supply chain	36 ff., 42 ff.	
	102-11	Precautionary Principle or approach	152 ff.	
	102-12	External initiatives	117, 124 f.,133, 143	
	102-13	Membership of associations	143	

GRI Standard	Disclosure	Page	Omission/comment

Strategy

GRI Standard	Disclosure	Page	Omission/comment
GRI 102: General Disclosures 2016	102-14 Statement from senior decision-maker	25 f.	

Ethics and integrity

GRI Standard	Disclosure	Page	Omission/comment
GRI 102: General Disclosures 2016	102-16 Values, principles, standards, and norms of behavior	76 ff., 117, 118, 143 ff.147 f.	

Governance

GRI Standard	Disclosure	Page	Omission/comment
GRI 102: General Disclosures 2016	102-18 Governance structure	11 f., 31, 36 ff., 277 ff.	

Stakeholder engagement

GRI Standard	Disclosure	Page	Omission/comment
GRI 102: General Disclosures 2016	102-40 List of stakeholder groups	150	
	102-41 Collective bargaining agreements	139	
	102-42 Identifying and selecting stakeholders	149	
	102-43 Approach to stakeholder engagement	150	
	102-44 Key topics and concerns raised	150	

Reporting practice

GRI Standard	Disclosure	Page	Omission/comment
GRI 102: General Disclosures 2016	102-45 Entities included in the consolidated financial statements	149	
	102-46 Defining report content and topic Boundaries	149	
	102-47 List of material topics	150	
	102-48 Restatements of information	149	
	102-49 Changes in reporting	151	
	102-50 Reporting period	36	
	102-51 Date of most recent report		Annual report 2018 (January 1–December 31, 2018)
	102-52 Reporting cycle	36	
	102-53 Contact point for questions regarding the report	298	
	102-54 Claims of reporting in accordance with the GRI Standards	149	
	102-55 GRI content index	289 ff.	
	102-56 External assurance	273 ff., 281 f.	

GRI Standard	Disclosure		Page	Omission/comment

Topic-specific Standards: Economic

Procurement Practices

GRI Standard	Disclosure		Page	Omission/comment
GRI 103: Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	42 ff.	
GRI 204: Procurement Practices 2016	204-1	Proportion of spending on local suppliers	43	

Anti-corruption

GRI Standard	Disclosure		Page	Omission/comment
GRI 103: Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	147 f.	
GRI 205: Anti-corruption 2016 ✓	205-1	Operations assessed for risks related to corruption	148	
	205-2	Communication and training about anti-corruption policies and procedures	148	Available data include information on the number of individuals participating in e-learning courses by topics (no further differentiation by employee category or region), the number of individuals participating in training courses as well as preventive measures in relation to business partners (without quantity). The members of the governing body (Supervisory Board) are regularly informed about compliance topics including anti-corruption measures

Topic-specific Standards: Environmental

Emissions

GRI Standard	Disclosure		Page	Omission/comment
GRI 103: Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	124 ff.	
GRI 305: Emissions 2016 ✓	305-1	Direct (Scope 1) GHG emissions	125 f.	Included in the reporting are production sites, workshops and service locations, as well as GEA Group Aktiengesellschaft as Global Corporate Center.
	305-2	Energy indirect (Scope 2) GHG emissions	125 f.	A market-based calculation was additionally performed for Germany and New Zealand.
	305-3	Other indirect (Scope 3) GHG emissions	125 f.	Currently, this performance indicator merely subsumes reporting on business travel. In this context, GEA differentiates between air travel (global recording by GEA's travel agency), car rentals (rentals in Europe and in the US) as well as travel with Deutsche Bahn (bookings in Germany).
	305-4	GHG emissions intensity	126	

GRI Standard	Disclosure	Page	Omission/comment

Supplier Environmental Assessment

GRI Standard	Disclosure	Page	Omission/comment
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary 103-2 The management approach and its components 103-3 Evaluation of the management approach	129	
GRI 308: Supplier Environmental Assessment 2016	308-1 New suppliers that were screened using environmental criteria	129	All supplier audits are reported. No differentiation between new and existing suppliers.

Water and Effluents

GRI Standard	Disclosure	Page	Omission/comment
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary 103-2 The management approach and its components 103-3 Evaluation of the management approach	126 ff.	Overall, water and wastewater are not material topics; GEA nevertheless reports some general key figures and provides information on the management of water risks.
GRI 303: Water and Effluents 2018	303-1 Interaction with water as a shared resource	126 ff.	
	303-2 Management of water discharge-related impacts	127 f.	
	303-3 Water withdrawal	127	
	303-5 Water consumption	127	

Effluents and Waste

GRI Standard	Disclosure	Page	Omission/comment
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary 103-2 The management approach and its components 103-3 Evaluation of the management approach	128 f.	Overall, waste is not a material topic; GEA nevertheless reports some general key figures and provides information on the use of waste products for alternative production methods.
GRI 306: Effluents and Waste 2016	306-2 Waste by type and disposal method	128	

Topic-specific Standards: Social

Employment

GRI Standard	Disclosure	Page	Omission/comment
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary 103-2 The management approach and its components 103-3 Evaluation of the management approach	136 ff.	
GRI 401: Employment 2016	401-1 New employee hires and employee turnover	137 f.	

Occupational Health and Safety

GRI Standard	Disclosure		Page	Omission/comment
GRI 103: Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	118 f.	
GRI 403: Occupational Health and Safety 2018 ✓	403-1	Occupational health and safety management system	119 ff.	
	403-2	Hazard identification, risk assessment, and incident investigation	120	
	403-3	Occupational health services	120 f.	
	403-4	Worker participation, consultation, and communication on occupational health and safety	118	
	403-5	Worker training on occupational health and safety	121	
	403-6	Promotion of worker health	123	
	403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	120 f., 123	
	403-9	Work-related injuries	122	Types of injuries not reported.

Diversity and Equal Opportunity

GRI Standard	Disclosure		Page	Omission/comment
GRI 103: Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	141 f.	
GRI 405: Diversity and Equal Opportunity 2016	405-1	Diversity of governance bodies and employees	142	Age groups for the members of the governing bodies are not reported.

Supplier Social Assessment

GRI Standard	Disclosure		Page	Omission/comment
GRI 103: Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	145 f.	
GRI 414: Supplier Social Assessment 2016	414-2	Negative social impacts in the supply chain and actions taken	145 f.	Material topic in the area of human rights

GRI Standard	Disclosure	Page	Omission/comment

Sustainable engineering (not covered by an existing GRI Standard)

For GEA it is crucial to optimize the impact of products and solutions (outside the organization) under economic, ecological and social aspects, taking into account both opportunities and risks.
This is what GEA understands by "sustainable engineering." For the time being, this material topic is substantiated by existing appropriate GRI information (see below: customer health and safety, customer privacy); 2020 is expected to see the launch of an internal project to determine whether it is possible to identify more suitable indicators for providing evidence of sustainable engineering/sustainable products.
Parallel projects aimed at expanding climate reporting to customers and the supply chain are under way.

Customer Health and Safety

GRI Standard	Disclosure	Page	Omission/comment
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary 103-2 The management approach and its components 103-3 Evaluation of the management approach	118 f.,120, 123, 130 f.	
GRI 416: Customer Health and Safety 2016 ✓	GEA specific disclosure: Number of certificates in accordance with ISO 9001, 14001, 50001 as well as 45001	119 f.	The number of certifications serves as an indicator of quality and sustainability.

Customer Privacy

GRI Standard	Disclosure	Page	Omission/comment
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary 103-2 The management approach and its components 103-3 Evaluation of the management approach	134 f.	
GRI 418: Customer Privacy 2016	418-1 Substantiated complaints concerning breaches of customer privacy and losses of customer data	134	

Socioeconomic Compliance

GRI Standard	Disclosure	Page	Omission/comment
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary 103-2 The management approach and its components 103-3 Evaluation of the management approach	142 f., 143 ff., 147 f.	
GRI 419: Socioeconomic Compliance 2016 ✓	419-1 Non-compliance with laws and regulations in the social and economic area	143	Includes data protection breaches.

✓ audited by KPMG according to ISAE 3000

Contribution to the Sustainable Development Goals

The Sustainable Development Goals (SDG) were adopted by the General Assembly of the United Nations in 2015. The goals cover economic, environmental and social issues. The deadline for implementing the goals is 2030. Although the signatories, i.e. all nation states, are the primary addressees, the cooperation of other actors, including companies, is crucial for putting the goals into practice. GEA's contribution is illustrated by the following links to the GRI standards underlying GEA's sustainability reporting. Further information on the SDGs can be found at www.sustainabledevelopment.un.org. The links are based on the GRI publication "SDG Compass – Linking the SDGs and GRI."

Ensure healthy lives and promote well-being for all at all ages

Topic	GRI Standard
Spills	Waste by type and disposal method, GRI 306-2
Water quality	Water and Effluents, GRI 303
Occupational health and safety	Occupational Health and Safety, GRI 403

Achieve gender equality and empower all women and girls

Topic	GRI Standard
Gender equality	New employee hires and employee turnover, GRI 401-1; Diversity of governance bodies and employees, GRI 405-1
Women in leadership	Diversity of governance bodies and employees, GRI 405-1
Workplace violence and harassment	Negative social impacts in the supply chain and actions taken, GRI 414-2 (see section Human Rights)

Ensure availability and sustainable management of water and sanitation for all

Topic	GRI Standard
Sustainable water withdrawals	Water and Effluents, GRI 303
Waste	Waste by type and disposal method, GRI 306-2
Water efficiency	Water and Effluents, GRI 303
Water quality	Water and Effluents, GRI 303
Water recycling and reuse	Water and Effluents, GRI 303
Water-related ecosystems and biodiversity	Water and Effluents, GRI 303; Waste by type and disposal method, GRI 306-2

Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Topic	GRI Standard
Diversity and equal opportunity	Diversity and Equal Opportunity, GRI 405-1
Employment	Information on employees and other workers, GRI 102-8; New employee hires and employee turnover, GRI 401-1
Freedom of association and collective bargaining	Collective bargaining agreements, GRI 102-41 (see section Labor/management relations and co-determination)
Labor practices in the supply chain	Negative social impacts in the supply chain and actions taken, GRI 414-2
Occupational health and safety	Occupational Health and Safety, GRI 403
Water efficiency	Water and Effluents, GRI 303
Youth employment	New employee hires and employee turnover, GRI 401-1

Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Topic	GRI Standard
Research and development	Sustainable engineering: innovation

Ensure sustainable consumption and production patterns

Topic	GRI Standard
Air quality	Emissions, GRI 305
Energy efficiency	Sustainable engineering: certifications, innovation
Environmental investments	Emissions, GRI 305; Effluents and Waste, GRI 306
Procurement practices	Proportion of spending on local suppliers, GRI 204-1
Transport	Emissions, GRI 305
Waste	Waste by type and disposal method, GRI 306-2
Water efficiency	Water and Effluents, GRI 303

Take urgent action to combat climate change and its impacts

Topic	GRI Standard
Environmental investments	Emissions, GRI 305; Effluents and Waste, GRI 306; Management Approach, GRI 103, to sustainable engineering: innovation
GHG emissions	Emissions, GRI 305

Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Topic	GRI Standard
Environmental investments	Emissions, GRI 305; Effluents and Waste, GRI 306
Ocean acidification	Emissions, GRI 305

Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Topic	GRI Standard
Environmental investments	Emissions, GRI 305; Effluents and Waste, GRI 306
Forest degradation	Emissions, GRI 305

Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Topic	GRI Standard
Anti-corruption	Operations assessed for risks related to corruption, GRI 205-1; Communication and training about anti-corruption policies and procedures, GRI 205-2
Compliance with laws and regulations	Non-compliance with laws and regulations in the social and economic area, GRI 419-1; Substantiated complaints concerning breaches of customer privacy and losses of customer data, GRI 418-1
Ethical and lawful behavior	Values, principles, standards, and norms of behavior, GRI 102-16
Grievance mechanisms	Management Approach, GRI 103, to Human Rights and to Compliance
Protection of privacy	Substantiated complaints concerning breaches of customer privacy and losses of customer data, GRI 418-1
Workplace violence and harassment	Negative social impacts in the supply chain and actions taken, GRI 414-2

Financial Calendar

APRIL 30 2020
Annual Shareholders' Meeting
for 2019

MAY 15 2020
Quarterly Statement
for the period up to March 31, 2020

AUGUST 12 2020
Half-yearly Financial Report
for the period up to June 30, 2020

NOVEMBER 5 2020
Quarterly Statement
for the period up to September 30, 2020

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GEA Stock: Key data

WKN	660 200
ISIN	DE0006602006
Reuters code	G1AG.DE
Bloomberg code	G1A.GR
Xetra	G1A.DE

American Depository Receipts (ADR)

CUSIP	361592108
Symbol	GEAGY
Sponsor	Deutsche Bank Trust Company Americas
ADR-Level	1
Ratio	1:1

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This report includes forward-looking statements on GEA Group Aktiengesellschaft, its subsidiaries and associates, and on the economic and political conditions that may influence the business performance of GEA. All these statements are based on assumptions made by the Executive Board using information available to it at the time. Should these assumptions prove to be wholly or partly incorrect, or should further risks arise, actual business performance may differ from that expected. The Executive Board therefore cannot assume any liability for the statements made.

Note regarding the rounding of figures
Due to the commercial rounding of figures and percentages, small deviations may occur.

Note to the statement
This statement is the English translation of the original German version. In case of deviations between these two, the German version prevails.

engineering for
a better world

We live our values.

Excellence • Passion • Integrity • Responsibility • GEA-versity

GEA is one of the largest suppliers for food processing technology and of related industries. The global group specializes in machinery, plants, as well as process technology and components. GEA provides sustainable solutions for sophisticated production processes in diverse end-user markets and offers a comprehensive service portfolio.

The company is listed on the German MDAX (G1A, WKN 660 200), the STOXX® Europe 600 Index as well as the DAX 50 ESG Index and selected MSCI Global Sustainability Indexes. With an "A-" rating, GEA is among the leading group in the climate benchmark Carbon Disclosure Project.

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