

Sustainability Report 2019

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_Foreword



Dear Readers,

Voith has a track record of over 150 years of success in industry, of continual innovation, and of shaping technological transformation in a socially responsible way. Companies with such a long tradition are particularly required to fulfill their responsibility to society and to shape its future sustainably. We are rising to meet this challenge and intend to become a catalyst and co-shaper of a decarbonized industry in the digital age.

Finding answers to the great issues of our time is what spurs us on and characterizes our actions as a company. Our focus here is on the three megatrends of decarbonization, digitalization, and the circular economy. We are driving regenerative hydropower, enabling paper production from naturally renewable raw materials, and developing drivetrain technologies for efficient, environmentally friendly mobility. These examples illustrate how Voith is contributing to the sustainable development of entire macroeconomies through our products, our know-how and our high-performance team.

With the Sustainability Strategy as our compass we have been working for many years to achieve continual and above all measurable improvements. At the beginning of the current fiscal year we entered our new target period, which for the first time also includes a specific CO₂ target.

From 2022 onwards, all Voith locations worldwide will have a CO₂ footprint of zero.

To achieve this, our energy sourcing will be fully CO₂-neutral and we will compensate unavoidable CO₂ emissions. Furthermore, Voith will invest €5 million annually in the energy efficiency and own energy generation of its locations.

With this tenth successive Sustainability Report we are once again making our actions transparent. After all, our stakeholders decide whether our sustainability measures are successful: Their assessment forms the benchmark for our actions, as this reflects the effectiveness of our activities in the respective fields of action.

We also have our sustainability performance constantly examined through external ratings. Last year for instance, ISS ESG once again awarded Voith Prime status, thus continuing to place us in the top 25 % of our sector. We benefit from this recognition economically as well as professionally, as ratings such as these are increasingly a major factor for banks in assessing a company and thus its creditworthiness. This is what sustainable business is all about: environmental and societal improvements leading to tangible economic benefits.

We intend to keep setting the benchmark in our industries and markets regarding sustainable business. This goal has shaped our engagement from the very beginning, and it most especially applies when business and society are facing major challenges, as is currently the case. We firmly believe that doing business sustainably will also lead to persistent, long-term economic success.

I thank you most warmly for your interest in Voith's sustainability commitment – and wish you an informative and inspiring read!

Sincerely yours,

A handwritten signature in blue ink that reads "Toralf Haag". The signature is fluid and cursive, with the first name "Toralf" and the last name "Haag" clearly distinguishable.

Dr. Toralf Haag

President and CEO

1_Strategy and Integrity

1.1 Our Profile

The Voith Group is a global technology group. With our broad portfolio of production plants, products, industrial services, and digital applications, we set standards in five markets: Energy, Oil & Gas, Paper, Raw Materials, and Transport & Automotive. As one of Europe's largest family-owned companies, the way we conduct business has always been geared towards sustainable, profitable growth.

At Voith we define business success as a constant, long-term undertaking. Our shareholders, the Supervisory Board, and the Voith Corporate Board of Management work together under a joint commitment to develop the company in an economically, environmentally, and socially sustainable way. Clearly defined values serve as our compass – and sustainability is one of them.

Our economic strength is based on the following four strategic principles which we have carefully established over the decades:

- A diversified product portfolio based on megatrends
- An international footprint and strong local roots
- Our innovative capabilities
- Our financial independence as a family-owned company.

On this basis, over recent years Voith has set a strategically important course, consolidated its product portfolio, and improved its operating profitability through targeted measures and initiatives. In the 2018/19 fiscal year we defined five strategic priorities across all measures, which will help us continue to drive our economic growth in the future.

 [Annual Report 2018/2019 p. 23/24](#)

We want to create sustainable technologies for future generations – and this central aspiration determines the core of our economic activities. Today, our core business

already addresses the global megatrends of digitalization, decarbonization, and the circular economy – for developing hydropower, for resource-efficient paper production, and for the electrification of mobility. In future we intend to expand our sustainability portfolio and help co-create the decarbonized industry in the digital age. We will strengthen our own role in the circular economy and work consistently on becoming the benchmark for sustainability in our markets.

Overview of The Group

Voith is represented at locations in over 60 countries and maintains a comprehensive network of production, service, and sales units on every continent. Voith GmbH & Co. KGaA, headquartered in Heidenheim an der Brenz, Germany, is the management holding company and parent company of the Group. The Group's core functions are also concentrated within it. The Corporate Board of Management of Voith Management GmbH is responsible for the strategic and operational management of the Voith Group. Voith Management GmbH, which is 100 percent family-owned, as is Voith GmbH & Co. KGaA, manages the businesses of Voith GmbH & Co. KGaA as the personally liable shareholder. The General Managers of Voith Management GmbH are appointed by the Shareholders' Committee of Voith Management GmbH. The supervisory body of Voith GmbH & Co. KGaA is the Supervisory Board.

 [Annual Report 2018/2019 p. 10 ff., 16 and 176 ff.](#)

The operating business is organized into four Group Divisions:

- The Group Division Voith Hydro is a leading full-line supplier for equipping hydropower plants, providing customized, long-term solutions, and services covering the entire plant lifecycle and all major components for large and small hydropower plants.
- The Group Division Voith Paper is a leading full-line supplier in the paper industry. Thanks to constant innovation, Voith Paper continually optimizes the paper production process and enables resource-efficient production.
- The Group Division Voith Turbo is a specialist in intelligent drive solutions, systems, and leading-edge services. It works with customers from highly diverse industries

such as oil and gas, energy, mining and mechanical engineering, ship technology, and rail and commercial vehicles.

- The Group Division Voith Digital Ventures brings the Voith Group's long-standing automation and IT expertise together. Founded in 2016, this Group Division plays a central role for Voith in the development of new digital products and services.

Organizational structure

Voith Group Divisions



Management System

The key financial performance indicators for the Voith Group are the development of orders received and sales, as well as EBIT (earnings before interest and taxes) and ROCE (return on capital employed).

 [Annual Report 2018/2019](#) p. 21 f.

Business Development 2018/19

The Voith Group performed well overall in the 2018/19 fiscal year, despite a challenging market and competitive environment, and returned to profitable growth. As announced, we improved all key figures in the Group and achieved our corporate targets.

The number of orders received increased significantly, driven by a strong increase in the Group Division Hydro, and amounted to €4,691 million (+9%). Orders on hand in the Voith Group increased by more than €400 million to €5,630 million, the highest level in seven years. Sales also grew slightly to €4,276 million (+2%). We were able to increase the operating result disproportionately, with EBIT rising by 12% to €215 million. Accordingly, the return on sales and ROCE improved noticeably. The bottom line, Group net income after taxes, was reported at €72 million – an increase of 49% versus the previous fiscal year.

Following this good result in the fiscal year now closed, the Voith Group's financial situation continues to be very solid. As at the balance sheet date, net liquidity amounted to €552 million and thus remains at a healthy level.

In the 2018/19 fiscal year we invested €113 million in property, plant and equipment, and intangible assets (previous year: €94 million, +20%), mainly in further improving our production sites. As a percentage of the Group's sales, our investment ratio amounted to 2.6% in the reporting year (previous year: 2.2%).

 [Fact base](#) Economic Indicators

 [Fact base](#) International Focus

 [Annual Report 2018/2019](#) p. 37

Further Strengthening the Core Business

Voith adjusted its growth strategy in the 2018/19 fiscal year. The focus remains on further strengthening the successful core business, also through targeted acquisitions. For example, in September 2019 Voith announced the takeover of BTG, one of the largest acquisitions in company history at €319 million. BTG is active worldwide as a provider of integrated, highly specialized process solutions for the global pulp and paper industry and will strengthen Voith Paper's position in the future as a full line supplier.

One of the new venture activities in the reporting year is Pilotfish, a provider of cloud-based applications for public transport. In January 2019 Voith acquired 56% of the Swedish company, which is now being integrated into the Voith Group. In addition, in April 2019 we founded a joint venture with TSP, a globally leading American technology service provider. The new joint company, TSP OnCare Digital Assets Inc., offers manufacturer-independent services for automation and digital products and has been one of the key suppliers of services to quality control and monitoring systems in the US paper industry from the outset.

Our venture portfolio continues to include the digital service provider Ray Sono, FlowLink Systems, a provider of industrial valves and components, as well as Voith Robotics. The recycled paper marketplace merQbiz is shown as a discontinued operation; initial discussions are underway with potential investment partners who want to continue merQbiz together with Voith as a minority shareholder.

Large Hydro Order Creates Organic Growth

Numerous new orders ensure Voith's organic growth in the coming months and years, in particular the award of the Snowy 2.0 project: This is one of the largest pumped storage power plants in the world, for which Voith Hydro will supply six reversible pump turbines to Australia. Snowy 2.0 is the second-largest single order in the 152-year history of the Voith Group.

Excellence Initiatives Continue

The pursuit of excellence remains one of our core principles. The initiatives of our Group-wide excellence program are progressing consistently as part of our strategy for profitable growth. Initial successes due to our excellence measures in the areas of Engineering, Production and Administration, as well as the planned focus of German production on fewer and larger locations, will have a positive effect on the result. Therefore, our plan stipulates a significant increase in EBIT and ROCE during the 2019/20 fiscal year while keeping the development of sales revenue stable.

Digital Agenda

Voith pursues the goal of co-shaping industrial digitalization, and will continue to invest strongly in key competencies for the industrial Internet of Things (IOT) megatrend in the coming years. Building on our broad technological know-how and deep market knowledge, we want to become a driving force and co-shaper of the decarbonized industry in the digital age. This is an overarching principle across all Group Divisions.

Continuing to expand our digital product and service offering therefore remains a strategic focus. Our strictly customer-focused digitalization strategy is already showing measurable successes: For example, our OnCumulus modular platform for the industrial Internet of Things, which we developed in-house, is seeing a strong increase in demand. Likewise, acquisitions such as Pilotfish and joint ventures such as TSP OnCare Digital Assets Inc. are helping Voith continue to expand its offering of digital products and solutions throughout the value chain in the major Group Divisions.

To align our digital offerings even more closely with customer needs, the Group Divisions are responsible for marketing the digital product portfolio in our core markets as of the 2018/19 fiscal year. This means they are being given significantly more responsibility for further expansion of the digital business in their markets.

1.2 Strategy and Organization

Sustainability as a Core Objective

As a family-owned company we are committed to environmentally friendly, fair, long-term business practices. Furthermore, we intend to create measurable added value for the sustainable development of our company, society, and the environment. The goal we set ourselves regarding the way we conduct business is also correspondingly high: We want to make Voith the benchmark in sustainability issues globally and in all markets and sectors in which we are active. With clearly structured processes and an effective sustainability organization, we see ourselves as well positioned to meet this objective. Our engagement in this area is also viewed increasingly positively by external parties. For example, the Prime status confirmed by ISS ESG in the reporting year enables Voith to obtain more favorable terms on the capital market.

Efficient Sustainability Organization

At Voith, sustainability is seen as a cross-functional responsibility shared by our Corporate Board of Management, Group Divisions, and Corporate Departments. The central function Corporate Sustainability & HSE sets the framework for our strategic focus and the way we organize sustainability, and reports directly to the President and CEO. It takes decisions on the necessary tools and methods, such as our sustainability database and associated reporting tools, used within our Group to measure and steer our sustainability activities. Furthermore, this central function is directly responsible for the Sustainability Office.

The Sustainability Office uses benchmarking and environment analyses as well as intensive dialog with stakeholders to ensure that essential requirements for the

company are identified and transferred to the organization. It is also responsible for internal and external reporting, and for the coordination of communication tasks relating to sustainability. The organizational anchors for Green Controlling and the ongoing strategic development with regard to sustainability are also placed here.

In addition, the Sustainability Office is a central point of contact for customer queries and ratings with a focus on sustainability. The Office gathers requirements, develops suitable strategies and measures in collaboration with the specialist departments, and monitors their implementation.

In the 2018/19 fiscal year, the Sustainability Office developed the sustainability strategy further and agreed the respective goals with the Corporate Board of Management. The central aim here is to make continuous and measurable improvements in the areas of environmental, social and corporate governance to create economic value added for the company. For example, we intend to achieve a leading position in our industries by 2025, as confirmed by external and independent rankings and ratings.

To make this goal measurable, the Sustainability Office has evaluated the results of the stakeholder dialog and carried out a detailed determination of Voith's positioning in the area of sustainability. To do so, a comparison group of 79 relevant customers and competitors from all relevant markets was defined. The result: Voith is already a leading company in terms of sustainability in its traditional sector of mechanical engineering, but we need to take further steps across all other industries to achieve a leading position here as well. In joint workshops, the specialist departments and the Sustainability Office have already identified the corresponding potential for optimization. We will provide information on progress in the Sustainability Report.

New Steering Committee Established

As the central steering committee for all sustainability activities, the Corporate Sustainability Council (CSC) has so far reported directly to our Corporate Board of Management. The Committee did not meet in the fiscal year just passed and was replaced at year-end by the newly established Quality and HSE/Sustainability Board. We intend to anchor the topic of sustainability even more firmly at our locations by means of target- and demand-oriented management in the Group Divisions. During the transition phase, the corresponding sustainability activities were continued via the Sustainability Office on departmental and operational levels. The Group Sustainability Policy will be revised in the 2019/20 fiscal year to reflect this organizational change.

Group-wide Approach to Sustainability

We take a systematic approach to implementing our Sustainability Strategy and have defined five fields of action to do so. Practicing sustainable corporate governance and our pursuit of profitable growth are just as much a part of these fields of action as our responsibility towards our products, the environment, and our employees.

We routinely bring transparency to these topics, publish our objectives and activities, and document our progress. Top priority is given to informing and raising the awareness of our employees. For instance, our internal quarterly reports contain a detailed list of measures outlining the tasks, responsibilities, and deadlines for each operational level. In the fiscal year, we made greater use of the opportunities offered by online communication to involve employees and the respective operating units

even more closely in our sustainability activities. The response via social media in particular shows how firmly the topic of sustainability is now anchored in the company and how willing our employees are to get involved. We also ran a higher number of articles and interviews on the subject of sustainability in our employee magazines.

Targeted Reporting Increases Transparency

We have kept all our stakeholders updated through our annual Sustainability Report since 2009, in which we focus on the fields of action that our company and stakeholders identify as most material. The report is made available online together with a supplementary fact base that includes detailed information intended mainly for sustainability experts and specialists. In addition to the above, we have explained our sustainability activities for many years now in our Annual Reports.

Comprehensive Stakeholder Dialog

Maintaining ongoing dialog with stakeholders is vital for a global group such as Voith and we have done this for many years. Our key dialog partners include shareholders, supervisory committees, rating agencies, employees, the Works Council, our customers, suppliers and investors, as well as neighboring communities, trade associations, academia, government agencies, and policy-makers. We also focus on NGOs, such as the World Wide Fund for Nature, as well as the broader interested public.

 **Fact base** Memberships and Associations

Stakeholder Survey and Materiality Analysis

A regular stakeholder survey provides the basis for analyzing feedback from various stakeholders and then incorporating the findings into our company's decisions. Key stakeholders such as employees, customers and job applicants are surveyed about their expectations towards the management at Voith and an assessment of their perceived performance. This ensures that the respondents only give information on topic areas in which they have some expertise.

The most recent survey in fall 2018 was taken into account in our engagement from the 2018/19 fiscal year onwards and shapes the underlying materiality analysis. This helps us prioritize our sustainability activities and define the crucial aspects for our company. In 2019, stakeholders' stated expectations were used to align the focus areas in the specialist departments and in sustainability reporting. For the full list of topics that are material for Voith, see Voith Sustainability Report 2018.

Part of the 2018/19 stakeholder dialog was also an impact analysis, according to which Voith has the most impact on the economy, society and the environment in the fields of products (30%), sustainable corporate governance (24%), employees (21%), the environment (15%), and the supply chain (10%).

Outlook Stakeholder Dialog

With a new survey model, we aim to better reflect our stakeholders' varying expectations and also integrate the often highly differing requirements of the regions. In addition, we plan to increase the frequency of surveys to allow us to respond even more promptly to our stakeholders' proposals. Against this background, we also plan to review our stakeholder dialog concept. In future we will include qualitative elements such as interviews to a greater extent; we also intend to make greater use of the opportunities offered by social media in order to better understand the requirements of our stakeholders and to be able to react more quickly to current developments.

Stakeholder Survey Results: Three Key Aspects per Field of Action

Employees

1. Strategic personnel development and training through continuous education and task-related training.
2. Ensuring safe working conditions by preventing accidents, noise and fire.
3. Promoting work-life balance with flexible, uniform working time models.

Products

1. Cooperating with customers as partners in product development.
2. Price/quality ratio of products in relation to their lifecycle.
3. Use and/or development of digital solutions to further optimize the product portfolio.

Sustainable corporate governance

1. Good corporate governance in the sense of legally compliant, value-aligned business practices.
2. Long-term business model that ensures sustainable and profitable company development.
3. Transparency regarding business practices as well as political and/or social commitment.

Environment

1. Efficient use of materials, avoiding waste, and recycling in production.
2. Use of renewable energy and reduction in greenhouse gas emissions.
3. Energy efficiency in production, e.g. optimizing use of energy in processes.

Supply Chain

1. Build and maintain cooperative long-term supplier relationships.
 2. Transparency about upstream value chains with regard to purchased materials and means of production, including their origin.
 3. Control mechanisms for compliance with laws and environmental and social standards in the supply chain (e.g. audits, training).
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1.3 Values and Compliance

How We See Ourselves

Voith unites the tradition of a family-owned company with the needs and culture of a global group. Clear values define the way we conduct business: We are innovative, reliable, fair, sustainable, and ambitious. Our values, and the guidelines we derive from them, ensure that Voith acts according to a unified set of business principles and a consistent philosophy worldwide.

Our Company Values

Ambitious: We live for challenges and set ourselves ambitious goals so that we can grow – both as individuals and together as a company.

Innovative: We want to implement ambitious ideas as innovative technology. To do so, we listen attentively, observe precisely, and consider new paths. This allows us to identify the direction the world and our customers are taking, create value-adding solutions, and set new benchmarks in our markets.

Reliable: At Voith we consistently strive for our customers' and partners' trust by only promising what we can actually deliver. This helps build stable and long-term relationships.

Fair: We engage with all of our stakeholder groups with respect, openness, honesty, and humility. This is not just about adhering to guidelines and laws, but demonstrating our ethical attitude.

Sustainable: We always act in accordance with our responsibility towards society and the environment. Our technical innovations are intended to contribute towards global growth and wealth. As a family-owned company, our aim is lasting financial independence.

 [CoC Code of Conduct](#)

Code of Conduct Binding on All Employees

Voith's main business principles have remained unchanged for almost 100 years. Back in 1927 Hanns Voith stipulated that: "In the business world one must be ethical, decent, and honest. If a contracting party or competitor behaves unfairly, this does not give us the right to deviate from this principle." These principles still govern the way we conduct business today. Our Code of Conduct defines the way we act towards customers and business partners, as well as how employees behave towards one another within the company. It can be viewed online and provides information on points of contact and the Voith Compliance Committee. We require every single one of our employees to comply with prevailing legislation and our company's internal regulations, right across our Group and all hierarchical levels. On signing the employment contract this obligation is formally established in writing, and any breaches are met with disciplinary measures. We constantly update our rules and procedures, and adapt them to meet current requirements. In addition, our values play a central role in the Voith Academy training programs, such as our Start-up Leadership Program for prospective executives.

The Voith Code of Conduct sets out clear standards that are aligned with established external charters and principles. The key principles include:

- Observance of the rules of fair competition
- No anti-competitive agreements
- No corruption or bribery, neither offering, granting, or demanding bribes, or accepting unfair advantages
- Transparency on donations and sponsorship
- Safeguarding our own trade secrets and patents, and respecting those of third parties
- No undue preferential treatment of suppliers and service providers
- Respect for human rights, fair working conditions, and rejection of child and forced labor
- Tolerance and equal opportunity

Clear Responsibilities: The Voith Compliance Organization

The Voith Compliance Committee establishes, develops, and coordinates our Compliance Program, revises compliance regulations, and coordinates training. This committee meets monthly and comprises the Head of Group Legal Affairs (Chairman) as well as the respective Heads of the Group Human Resources Management and Group Audit Departments. The Voith Compliance Committee Chairman reports directly to the Corporate Board of Management of Voith GmbH & Co. KGaA and to the Audit Committee of the Supervisory Board. The CFOs of the Group Divisions and the individual Group companies serve as the Compliance Officers in their units. Within their area of responsibility, our Compliance Officers are responsible for implementing our Code of Conduct and also serve as Group-wide points of contact. This is also aligned with the rest of our Risk Management organization.

Keeping Knowledge Up to Date Is Mandatory

All of our employees with access to computers are required to keep themselves regularly updated on compliance issues and on our Code of Conduct via our e-learning programs. Through their successful participation, employees also explicitly document that they are fully aware of our Code of Conduct and have understood the appropriate regulations. Around 97 % of our employees with a computer workstation completed our programs on Anti-Corruption and Antitrust Law, as well as on Leadership and Employees. A higher degree cannot be achieved owing to customary headcount fluctuation in a company, so we assume these programs cover our full workforce. Employees who do not have a computer workstation are trained by their line manager to ensure their knowledge is up to date. In the reporting year we continued to hold face-to-face courses, which are assigned automatically to employees. 604 employees, comprising mainly managers and employees from Sales and Purchasing, took part in 29 events. Separate, highly detailed training courses were offered to Compliance Officers from our Group Divisions.

 **Fact base** Compliance Training

 **Fact base** Compliance Guidelines for External Security Personnel

Group-wide Information and Complaints Reporting System

In principle, any stakeholder, including our own employees, can report complaints to Voith or notify us of abuse or breaches of the Voith Code of Conduct. They are free to report these instances to a variety of points of contact: direct line manager, competent HR representative, the Group company's or Division's Compliance Officer, or any member of the Compliance Committee. Details on how to get in touch with these points of contact are provided to employees in an appropriate way throughout the Group, including via the Compliance intranet page.

 **Fact base** Escalation Paths

An employee who reports a suspected breach of the Code of Conduct on the basis of firm evidence will not suffer any detriment. This right is laid down in our Code of Conduct (Group Directive 01/07). If necessary, Voith will take measures in each individual case to protect the employee reporting the suspected breach against any such detriment. To the extent possible and permissible under law, Voith will maintain confidentiality regarding the identity of employees reporting a breach of the Code of Conduct, or a suspected breach of its guidelines. The same applies to the identity of employees involved in the investigation of breaches of the Code of Conduct or a suspected breach thereof.

We also follow up on complaints submitted anonymously via our Group-wide whistleblower system, with the number and type of breaches documented centrally. This whistleblower system can also be accessed by external parties at any time via our company website and is thus also open to all our business partners and suppliers. Any type of complaint on any subject can be reported. And to ensure the strictest confidentiality is maintained, information about the number, type, and nature of complaints is not disclosed to external parties as a matter of principle.

Reports relating to environmental protection can also be submitted to the local Environmental Officer. The exact complaints process and escalation paths are set out in our HSE Group Directive and its annex, Environmental Incidents. Complaints are communicated based on their severity along disciplinary and functional reporting lines.

 **Fact base** Breaches of Compliance Regulations

Compliance Reviews Guarantee Effectiveness

The Group Internal Audit Department examines observance of all compliance regulations in a routine risk assessment involving around 35 operating units annually. We ensure that our business partners comply with our regulations by means of a Supplier Self-Assessment (SSA). In addition, all representatives and advisors are checked at the start and at regular intervals. The audit also covers topics such as corruption or blacklisting and is based on the database of an external service provider, among others. This is laid down in the corresponding Group directive. Finally, compliance also forms part of our General Purchasing Conditions (GPCs).

As in virtually all companies, in the reporting year there were isolated cases of compliance regulations breaches at Voith. Appropriate action was taken in all instances.

Continuous Optimization of Compliance Organization

We work tirelessly to optimize our Compliance organization and adapt it to meet new standards and requirements. For example, in January 2017 we implemented the principles of the UK Modern Slavery Act in our company. In light of this, among other things we also published our Management Board Declaration on Human Trafficking, Forced Labor and Child Labor. Furthermore, in the previous year we reviewed our compliance system against the requirements of the German federal government's National Action Plan on Business and Human Rights.

 **Management Board Declaration**

Statement

Voith – since more than 150 years – is a 100 % family owned company. As such, Voith is deeply rooted in the philanthropic values of the Voith family and fully acknowledges its responsibility as a good corporate citizen.

Already in 1927, long before the modern meanings of compliance and sustainability even existed, Voith expressed its principles of business conduct as follows: "In the business world one must be ethical, decent and honest. If a contracting party or a competitor behaves unfairly, this does not give us the right to deviate from this principle."

This statement is still today part of Voith's DNA as it is expressed in the foundation of our Code of Conduct (CoC): "Voith is aware of its responsibility to society, and it acts accordingly. We recognize the duty of our company and our employees to serve the common good."

Voith shares the values contained in the UN Global Compact principles. Together, the Voith Code of Conduct and the Voith values cover all areas addressed by the UN Global Compact.

However, Voith also shares the criticism of many NGOs that companies can misuse the UN Global Compact initiative as an instrument of 'greenwashing', which is also why Voith is not a member of the initiative. We at Voith are strongly convinced that our historically grown individual commitment as it is stated in our Code of Conduct and expressed by our values is the right and maybe even the better approach.

No Compromise Against Corruption

For Voith, taking rigorous action against corruption goes without saying. This is why all Compliance Officers are required to keep a Risk Control Matrix, which also includes potential corruption risks for their specific Group unit, and to name and assess the identified risks. This structured process covers all Voith locations worldwide; the results of all Group Divisions are aggregated and form the basis of internal compliance audits, among other measures.

Our risk assessment is based on many factors including the Corruption Perception Index (CPI) published annually by Transparency International. The index ranks virtually all countries by their perceived levels of corruption on a scale of 1 to 100. As our company maintains business relationships all over the world, special precautionary measures apply to high-risk countries, whereby the risk manager responsible decides on the most appropriate measures.

Human Rights

As a global group, Voith observes human rights as a matter of course. The framework for this is set out in the Code of Conduct, which is binding for all employees via a corresponding Group directive. Through our General Purchasing Conditions we also ensure that our suppliers and business partners are involved in upholding human rights. As part of this, we also incorporate the assessments of our internal management systems, such as the Risk Country List, into our action planning activities.

Voith rejects any and all forms of human trafficking, forced labor and child labor, and has accordingly issued a Declaration, which is publicly available online. This declaration is in accordance with the UN Universal Declaration of Human Rights 1948, the California Transparency in Supply Chains Act 2010, and the UK Modern Slavery Act 2015.

Confidential Treatment of Information

Information security and the protection of personal data take top priority at Voith. Every employee is expected to show appropriate awareness of security and a sense of responsibility. Appropriate handling of operational and business information, as well as the personal data of our business partners and employees, is governed by

our Group Directives on Information Security and Data Protection. We are pleased to announce that there were no notifiable breaches of data security in the reporting period. The processes implemented at our data center in Heidenheim are certified according to the international standard ISO/IEC 27001.

Taxation Compliance

At Voith we see compliance with all statutory taxation requirements and fulfilling our tax obligations as a matter of course. Our Group's taxation strategy is aligned with our company's values and commits us to interacting with tax authorities in a fair and transparent manner.

Transfer prices within the company are always based on the "arm's length" principle and are always lawful. In addition, Voith avoids implementing artificial structures purely for tax purposes: This is clearly regulated in our Group's corresponding transfer pricing guidelines, through which Voith follows the OECD standard. Voith has no subsidiaries in countries that are on the EU list of non-cooperative countries and territories for tax purposes. Voith always meets its obligations to the tax authorities completely and on time via country-by-country reporting. A complete list of the companies and countries included in the consolidated financial statements forms an integral part of the same statements.

To further improve compliance in the area of taxation, in the reporting year Voith continued to develop its internal taxation auditing system to become a tax compliance management system that is almost completely integrated within the Group's compliance management system.

1.4 Responsibility for Society

We see ourselves as a company that plays an active social role – something that has been part of our DNA ever since we were founded. In Heidenheim, where we have our headquarters, as a good neighbor we are actively involved in various initiatives, for example as sponsor of a training program run by the Sonderberufsfachschule Hanns Voith (Hanns Voith Special Vocational College). We focus on the areas of sports, education, social affairs, and culture, which we support either through direct financial contributions or in-kind benefits. In doing so, we always ensure strict compliance with our Code of Conduct and applicable laws.

Group Directive Sets the Framework

Ever since 2008, our Group Directive on Donations and Sponsorship has set out the type and scope of our commitment. It also outlines the financial frameworks of our donations. The budget is based on the previous year's Earnings Before Tax (EBT) and is limited to a maximum of 1 % of EBT or at least two-thirds of the volume of funding in the year before last, unless otherwise determined by the Corporate Board of Management. This ensures that we can provide consistent support, irrespective of any volatility in our company's development. We record our donation and sponsorship activities, covering all our global activities and across all business units, using our internal management systems. In the 2018/19 fiscal year, organizational responsibility passed from the Legal Affairs Department to Corporate Communications, so that all activities for both sponsorship and donations are now coordinated by one department. The Head of Corporate Communications updates the Corporate Board of Management once a year on how funds have been allocated across the entire Voith Group.

We apply clear criteria in selecting projects. To qualify for assistance, we must all be convinced of the recipient's integrity and that their project is a worthy one. We also take into consideration the regional relevance and the appropriateness to our business segments, values, and corporate culture. Furthermore, we consider the frequency and volume of previous contributions, ensuring these are distributed as widely as possible. Irrespective of this, in humanitarian emergencies where urgent action is demanded we provide help quickly and directly.

By contrast, our sponsorship activities always focus on the appropriateness of the contribution and the benefit we receive in return. This is because we follow additional, mainly communicative goals besides providing sponsorship. Irrespective of this, it is also highly important to us that our sponsorship partnerships are engaged in worthy and reputable causes.

Fact base Donations and Sponsorship

Social Engagement Activities Follow Set Guidelines

Our social engagement activities are managed by Voith GmbH & Co. KGaA, headquartered in Heidenheim. Within the company, responsibility for the areas of donations and sponsorship is now coordinated by Corporate Communications. Individual Group Divisions and local Voith companies can also launch and run their own assistance and sponsorship projects, provided they comply with our Group Directive and are approved in accordance with the process specified within it. Many of our employees volunteer their spare time to assist people in need. We support them by granting temporary paid release from work and providing materials or equipment that is no longer required.

We also support numerous initiatives and projects in coordination with the Hanns Voith Foundation. Through its activities, this independent foundation regularly engages in numerous local and cross-regional initiatives, and also provides financial support in the form of annual donations to various projects.

Hanns-Voith-Foundation

Our Engagement Activities in the Reporting Period

In the reporting year we invested around €2.27 million in social engagement activities (previous year: €1.64 million). Of this, we provided €1.23 million in the form of donations, while €1.04 million was used for sponsorship measures. We spent the greatest share on education (49%), followed by sports (39%), social projects (8%), and cultural projects (4%). In the reporting year no political parties or political organizations received any financial contributions from Voith, nor did they in the year before.

 **Fact base** Donations and sponsorship for political parties and party-political organizations

Involvement in Sports with a Local Focus

Voith sponsors professional as well as amateur sports and – albeit with a focus on Heidenheim – supports sports clubs and events around the world. In the reporting year we invested €0.88 million in this area (previous year: €0.86 million). Voith is a long-standing supporter of the professional soccer club 1. FC Heidenheim 1864 e.V., based in the same city as our headquarters. This involvement includes sponsoring the naming rights to the Voith Arena and supporting the club as the principal sponsor of the soccer shirts and perimeter boards. Through this, we intend to increase the attractiveness of the location for our employees and make it a more appealing place for them to spend their free time.

In addition, we sponsor the fencing center of the Heidenheimer Sportbund 1846 e.V. (HSB – Heidenheim Sports Association) as well as the local HSB baseball team and the HSB Athletics Department, whose training site bears the name Voith-Sportzentrum (Voith Sports Center). We believe that supporting local initiatives is an investment in the attractiveness of the region, and one that benefits both the regional citizens and our employees. Furthermore, in the 2018/19 fiscal year we once again provided financial assistance to the cycling club sunpor St. Pölten and to the Crailsheim Merlins basketball team.

Multifaceted Educational Involvement

We support kindergartens, schools, and universities around the world, as we firmly believe that sound education and training provide the basis for the best development opportunities in people's lives. In this sense we are continuing the tradition of Hanns Voith. Since way back in 1946, in its home State of Baden-Württemberg Voith has dedicated itself to preparing disadvantaged young people for vocational training schemes and the world of work. What initially started as a vocational preparation and training course has since become an institution, and has been recognized since 2004 as the Sonderberufsfachschule Hanns Voith (Hanns Voith Special Vocational College). 16 years have passed since we began supporting the Germany-wide business@school education initiative of The Boston Consulting Group (BCG). It gives senior high school students a closer look at business, including hands-on experience, over the course of a full academic year.

Promoting Culture at our Heidenheim Location

We want to give as many people as possible access to culture. As an example, in the reporting period we provided financial support to various institutions in Heidenheim, including a €67,500 donation to the Opera Festival.

Engagement for Integration

For many years, Voith has actively pursued its global social engagement, aimed at improving people's living conditions and promoting intercultural exchange. For instance, Voith is one of the initiators of the German industry integration initiative Wir Zusammen (We Together), dedicated to helping refugees integrate in Germany. We are involved in providing an introductory vocational training course for young refugees to facilitate their start into professional life or vocational training.

2_Environment

2.1 Environmental Management Approach

As an industrial company Voith is required to comply with numerous national, regional, and industry-specific environmental laws, regulations, and guidelines. In addition, we see it as our responsibility towards our employees and neighbors to both prevent environmental risks and use resources responsibly. As a manufacturer, our main focus therefore lies on energy and resource management. This is why we are committed to continually reducing our energy consumption and corresponding greenhouse gas emissions, making efficient and safe use of both direct and raw materials, and minimizing waste. We also aim to continually reduce our water withdrawal and wastewater volumes.

We have taken a consistent approach to organizing our operational environmental protection activities – combined with our occupational health and safety activities – in a uniform business partner structure aligned with the Group's Shared Services system. This Center of Competence HSE serves as a one-stop shop for methods, tools, and standards for our Group Divisions, with projects managed and coordinated directly by divisional HSE managers. In Germany an employee from the Center of Competence HSE additionally supports each Group Division, serving as a business partner and central point of contact who advises the management team of the respective Group Division on all HSE topics.

Our operating units are responsible for implementing health, safety, and environment activities locally. Seasoned experts accompany the processes, helping to continuously improve HSE, leverage synergy potentials, and in doing so optimize service costs. Furthermore, as skilled partners they can be called upon to identify risks and systematically reduce them in a continual improvement process. Our hse+ software provides technical support that all colleagues can access anywhere in the world.

The HSE Steering Team comprises the Heads of the regional HSE service organizations and the members of the Center of Competence HSE. It meets biannually and is chaired by the Head of the central function Corporate Sustainability & HSE. The HSE Steering Team also conducts regional HSE audits. Our activities can be divided into two subject areas, irrespective of how they are embedded organizationally:

- Operational Environmental Protection – Eco Standards provides strategic and operational support to our divisions and locations in complying with and implementing environmental regulations and internal environmental protection policies. All requirements and obligations arising from approvals are available in our central hse+ database. In the reporting period we expanded our system to include a risk analysis tool that allows experts to evaluate environmental risks in a standardized way. In the reporting year we had already conducted 221 risk analyses using the tool.

We also observed a continuous improvement in the number and quality of incident reports. To maintain this positive trend, in 2019 we migrated our reporting system to a web-based IT solution, which further increased its user-friendliness. Furthermore, we improved the way we exchange information with the Insurance Department. Making a comparison with reported insurance claims ensures that our experts are aware of all the incidents that arise.

- Resource Protection – Ecological Business Management (EBM) improves energy and resource efficiency at our locations. We are also making constant progress in this area: In the reporting year we completed the modernization of a production area in Heidenheim, where we plan to achieve annual energy savings of over 6 GWh through the new heating and building technology system. We also decided to generate our own energy at several locations. Currently, the largest photovoltaic systems we have installed are located in Crailsheim (Germany), St. Pölten (Austria), and Vadodara (India). In addition, we are evaluating further renewable energy generation options and implementing them whenever economically feasible.

2.1.1 Operational Environmental Protection

With our approach to operational environmental protection we aim to minimize the environmental impacts of our operational activities, also by embracing the latest production processes and technologies. We attach particular importance to strategic and operational control, with the objective of ensuring that environmental regulations are upheld.

This includes the analysis and internal communication of potential environmental risks, categorized into risk classes according to their probability and impact. We analyze risks associated with climate change using our newly introduced environmental risk assessment module of our hse+ IT system (see next section). As part of our fundamental risk analysis we investigated all relevant locations for potential risks. Besides topics associated with climate change, which include heavy rain, flooding, and storms, our analysis also included other natural forces including seismic activity (Japan, Italy), volcanic activity (Indonesia), and forest fires (Australia). In addition to these activities, in 2019 we performed a global analysis on the topic of water, which identifies the risks for individual locations.

In the same year we also carried out an extensive assessment of the opportunities and risks posed by climate change for Voith as part of our Carbon Disclosure Project (CDP). The analysis also covered the strategic approaches and measures to counter risks identified. The results are freely accessible on the CDP website.

Highly Effective Environmental Protection Unit

Our HSE Steering Team coordinates and standardizes our operational environmental protection activities. We ensure that our environmental protection processes and procedures are organized as uniformly as possible through a central approvals process. In addition, we work tirelessly to continually reduce the amount and number of materials used at Voith.

Our HSE Group Directive sets out specific requirements on how environmental protection is to be organized at a local level, with every Voith location required to appoint an Environmental Officer. Their tasks cover a wide range of topics including immission control and water protection, waste management, hazardous materials and goods, and preventing environmental incidents. They also advise operations managers on new plant constructions, modifications, and approval processes and conduct regular site inspections and audits.

At our Group Divisions, environmental experts at the regional HSE service organizations ensure our Group companies are provided with systematic support. Regular site visits as well as the documentation and tracking of measures in our hse+ system have proved effective, as evidenced by the positive feedback from both the sites and the authorities. They reported that the greatest advantages of the software – which is in use globally – are the ability to store and manage all relevant documents centrally, manage appointments reliably, and schedule reminders.

IT System as a Central Information Source

Our Group-wide hse+ IT system supports the work of our environmental experts. With its ability to store and manage all relevant processes, documents, and analyses centrally, the system forms the basis for efficient operational environmental protection and matrix certification. We are pleased to announce that in the reporting year we continued to raise the tool's coverage to 81 % related to headcount.

Fact base Certifications

The powerful appointment management capabilities of hse+ enable all necessary steps to be planned efficiently in advance of inspections, and allow proactive communication with authorities. And because all Voith colleagues can access the software, they can provide backup support if a colleague is ill or on vacation.

hse+ also allows experts to access a central legal database that contains all the relevant HSE regulations and standards applicable to us in each country and region. Current legislative texts are available there, including summaries and comments in the respective national languages. The legal requirements are assigned to the relevant officer via the system, who is then responsible for ensuring the requirements are met. The same applies to Voith standards, approvals, and requirements.

hse+ is also used to perform location-related environmental risk analyses, assign implementation responsibilities to managers for the measures derived, and deadlines which are documented and controlled in hse+. We check and update the system regularly to include new locations, for instance. For major projects we add new service packages temporarily, and cancel those that are no longer required at the end of the project. This provides us with a highly effective, and at the same time inexpensive, global environmental management system.

Group-wide Reporting System to Record and Analyze Environmental Incidents

At Voith we record and analyze all environmental incidents centrally each month using a Group-wide reporting system based on standardized criteria. The Corporate Board of Management is informed about the results of the analysis on a quarterly basis. We use existing occupational health and safety categories to evaluate and rate incidents across topics according to the same standards. In doing so, we established that as awareness of our Group-wide standardized process increases, so too does its use – with the positive result being that a constantly growing database also increases the quality and conclusiveness of the analyses. We are also raising our employees' awareness by means of targeted internal communication measures. We are pleased to announce that no environmental incidents requiring public reporting were registered in the reporting period.

Targeted Hazardous Materials Management Increases Safety

In its production processes Voith uses hazardous materials such as paints, lacquers, thinners and solvents, adhesives, resins and hardeners, lubricants, cleaning agents, and industrial chemicals. The management of hazardous materials supports our efforts to replace particularly harmful materials with harmless substitutes. In the reporting period we began to categorize hazardous materials and consolidate them into application groups: The twofold goal is to prevent an increase in the number of new hazardous materials we use, and to support the phase-out of redundant materials.

Our Group-wide hazardous materials approval process ensures that these materials are handled as safely and securely as possible. A central hazardous materials database allows us to perform a uniform global analysis of the environmental, health, and safety risks of work and hazardous materials, providing us with a valuable decision-making basis. We have been working hard for many years now to consolidate the wide range of hazardous materials we use in order to eliminate particularly harmful materials and further encourage the use of low-risk substitutes as well as advance the harmonization of safety standards across the Group.

Since 2014 around 8,200 materials have been recorded centrally, 920 of which have either not been approved or blocked for future use. In the reporting year we processed 1,575 applications, of which approximately 5 % were rejected. Half of these were rejected because they contained banned or critical materials, while the remaining rejected applications were returned with a request to select a suitable substitute from our list of approved materials. Since rolling out our centralized approval process, the number of new substances to be added to the database has decreased significantly. To illustrate this, in the 2014/15 fiscal year 950 admission applications were received, whereas in the reporting year this number dropped to only around 500.

In the current fiscal year we also intend to include materials with an acute toxicity category of 1 to 3 in our system, so they are covered by our approval process. We expect this step will further reduce the number of materials used at Voith.

Fact base Work Materials and Hazardous Materials Approval Process

We are reducing hazard potentials as well as costs by cutting the number of redundant materials we use. By adhering strictly to the “polluter pays” principle, we aim to ensure that the use of approved materials in our hazardous materials database is prioritized over all others. Doing so means we meet environmental protection, occupational health and safety, and compliance requirements while achieving the greatest possible degree of standardization.

However, the abundance of materials to be recorded in the database and the inclusion of additional sites presents challenges, meaning that consolidation is taking longer than had been expected at the start of the project in 2011. Currently, we expect that the consolidation process for the German-speaking as well as wider European region will be completed in the 2019/20 fiscal year. In the 2018/19 fiscal year we began recording existing materials in the Americas and Asia in the database. Based on our previous experience, we expect the consolidation process to be largely completed by the end of the 2020/21 fiscal year at the earliest.

2.1.2 Efficient Use of Resources

With our Ecological Business Management (EBM) we aim to identify ecological and economic potentials for improving our production processes and to leverage these by performing process, system, and component-level analyses. Our individual locations are supported by the EBM managers from the Group Divisions, with our central function HSE coordinating the overall effort.

Production-related Energy Consumption

specific value in MWh/€ million in revenues



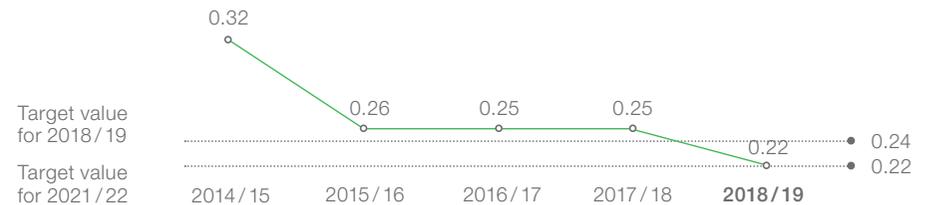
Waste

specific value in t/€ million in revenues



Freshwater Consumption

specific value in m³/€ thousand in revenues



Ambitious Environmental Goals

Our activities focus on the areas of energy, waste, and freshwater for which our Corporate Board of Management set specific targets, taking the 2011/12 fiscal year as the benchmark.

The 2018/19 fiscal year marked the start of our next target period, with our targets carried over based on the 2011/12 fiscal year. The three main drivers – energy, waste, and water withdrawal – remain the focus of our attention. By the end of the 2021/22 fiscal year we aim to reduce our energy consumption by 30%, our waste volumes by 35%, and our water withdrawal by 40%.

Fact base Environmental Goals

We also intend to make an additional contribution to climate protection by achieving specific CO₂ targets. These take the 2016/17 fiscal year values as the benchmark and follow a scientific approach. By this means, we intend to play our part in achieving the goals of the Paris Climate Agreement that entered into force in 2016 – in particular, its consensus goal of keeping global warming below 2°C. To set our targets we employed a forecasting method that considers both our internal changes, such as the development of Industry 4.0, and external factors such as the change in the energy mix in different regions.

In a first step, by the end of the 2021/22 fiscal year we aim to achieve a 25% reduction in our CO₂ emissions from our electricity consumption by optimizing our grid mix. By the end of 2024/25 we aim to reduce the total CO₂ emissions of our value-adding activities by 35%. Our goal is to achieve a 90% cut by the end of 2049/50. We will set additional interim targets and milestones for our CO₂ targets from 2024/25, taking into account our business development.

To achieve our grid mix target for 2021/22 and the interim target for 2024/25, Purchasing is developing an electricity procurement strategy that reflects the very different conditions for the procurement of eco-friendly electricity. The focus will initially be on the German and US markets, as the Chinese eco-electricity market is still at a very early stage of development.

While we narrowly missed our interim targets in 2017/18, for the 2018/19 fiscal year we are pleased to announce that we more than achieved them (see table).

Interim target/ Voith performance	FY 2017/18		FY 2018/19	
	Interim target	Voith performance	Interim target	Voith performance
Reduction in CO ₂ emissions generated by our energy consumption	-5.6%	-2.4%	-10.9%	-15.4%
Reduction in CO ₂ emissions relating to value-adding activities	-5.2%	-3.4%	-10.2%	-16.5%

Additional Target: Climate Neutrality by 2022

Furthermore, at the end of the 2018/19 fiscal year we decided to make all Voith locations around the world CO₂-neutral as of 2022. Until then, our targets and interim targets remain in force and we will continue to report on them. To achieve CO₂ neutrality as soon as possible, we will begin by purchasing CO₂-neutral electricity in the near term and compensating for unavoidable CO₂ emissions by means of offsetting measures. We are currently meeting 44.5% of our electricity requirements from renewable sources (2017/18 fiscal year: 38.5%) and plan to increase this share progressively, both through self-generation and by increasing the amount

we purchase. In addition, we will invest €5 million per annum in energy-efficiency measures, including power self-generation at our locations.

Green Controlling Process Delivers Maximum Transparency

Our approach to environmental management has already received numerous awards. To ensure that our resource management activities deliver both economic and environmental added value, we employ a four-stage Green Controlling process. It enables us to be transparent about the pipeline of measures, shows our progress towards implementing the measures mapped out in it, and depicts their impact on the development of indicators. This allows us to actively manage the target-achievement process. As a current example, in the reporting period the quarterly data we collect enabled us to identify that our freshwater withdrawal had risen again at our location in Shanghai. This led to specific steps and reduction targets being agreed with on-site management: The end result was that the location's current figures reflect the effectiveness of the measures implemented.

Hot-spot Analyses Leverage Further Potential

Hot-spot analyses serve to address both specific and cross-location topics. For example, they bring transparency to the energy consumption of a specific process step, making targeted intervention possible wherever needed. For efficiency reasons, we focus on the greatest consumption drivers in each case. At Voith Hydro this is the foundry; at Voith Turbo these are the buildings, machine tools, and test stands, while at Voith Paper this is the heat-setting process.

Recent analyses confirm findings from the previous year. These show that we are increasingly moving away from facility infrastructure topics (lighting, compressed air, heating, ventilation, and air conditioning) towards process-specific topics (such as the use of steel grit for sandblasting, and the heat-setting process for felt production). In doing so we are progressively leveraging the greatest value potentials; at the same time, the expense involved in implementing the measures is rising. Furthermore, it

became clear that organizational and conduct-based solutions need to be validated on a regular basis. In the reporting period we conducted 16 hot-spot analyses at 9 locations. Of these analyses, over half were in the form of energy audits. We also started a material-flow analysis for a production area in Heidenheim. We expect to obtain the results of the new methodology during the current fiscal year.

 [Fact base Hot-spot Analysis Methodology](#)

2.2 Performance in the Reporting Period

In the reporting period we rolled out our new resource efficiency targets to the Group Divisions and simplified our quarterly reporting. Going forward, we will communicate detailed information on our resource efficiency performance in an internal sustainability report. We have agreed on a blog-like format to accompany our quarterly reporting. Regarding our external reporting, we expanded its scope to include the CDP report, whose quality we will continue to improve over the next few years. In addition, we analyzed the water risks at our locations based on the WRI Aqueduct database and the WWF Water Risk Filter. We are currently examining how we can combine this risk analysis with an operational freshwater efficiency target.

To gain even deeper insights into all aspects of our resource consumption, in the past year we assessed our small and micro locations. Based on these findings, we determined per-capita resource consumption rates at all these locations. In future this will allow us to show the degree of coverage of our active resource management more clearly.

Furthermore, in the 2018/19 fiscal year we needed to initiate the energy audits that are required every four years. To do so we had to align the locations and areas

undergoing ISO 50001 certification – both with the new high-level structure of the current revision of the standard and with the new legal structure of our German production locations. In connection with this, we also incorporated each location's targets into our target management system. To further raise employee awareness of resource protection, we held training courses on the energy efficiency of compressed air systems at various locations in North America and Asia. Several recycling and waste-management workshops were held at our Kunshan location; for one Group Division we also developed an e-learning course on sustainability that will become mandatory in the Division in the next fiscal year.

2.2.1 Energy Efficiency and Greenhouse Gas Emissions

Production-related Energy Consumption Falls Slightly

In the reporting period we further reduced our absolute energy consumption, despite significant growth in sales. In the reporting year our production-related energy consumption stood at 420,040 MWh (previous year: 432,237 MWh). 98.1 MWh of energy was needed per € million in sales, a fall of 4.4 % versus the previous year (102.7 MWh per € million in sales).

This improvement is due to several factors. While maintaining a high volume in terms of implemented measures, various contracting projects in Heidenheim delivered expected energy savings, for example by means of a state-of-the-art heating and ventilation system. Overall, our space-heating and building-management efficiency projects achieved energy savings of 10 GWh globally. We also achieved improvements by switching over to alternate fuels in the production process, such as from diesel to LPG. By contrast, higher utilization of our foundry in Brazil – a very energy-intensive process – had the opposite effect. However, overall, higher utilization of our production locations is making a contribution to the positive development of the relevant performance indicators. In the reporting period the identified potential for actions in the pipeline rose from 130.8 GWh to 135.3 GWh (+3.5 % versus the previous year). Measures with a volume of 17.4 GWh (previous year: 23.0 GWh; –24.2 %) were implemented in the reporting period. As a result, total energy savings from implemented measures correspond to 125.2 GWh. Taking the figures of the 2011/12 fiscal year as our benchmark, we improved by 22.1 %. In doing so, we achieved our

interim target for energy consumption for 2018/19 and are well on track to achieve our target of a 30 % reduction by 2021/22.

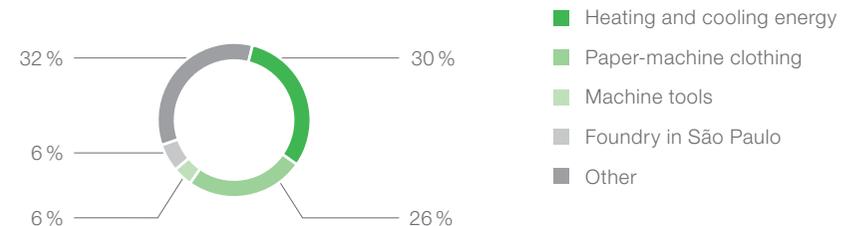
Fact base Energy-saving Measures and Further Potentials

Regular exchanges between our EBM (Ecological Business Management) experts serve to identify further potentials, compare processes, set benchmarks, and implement the best solutions in each case at Voith by sharing best practices. In the reporting year our experts focused on assessing a shortfall in reporting scope and active resource-efficiency management at small and micro locations that had not previously been considered. Besides heating and cooling, which account for around 30 % of our energy consumption, the production of paper-machine clothing remains the key driver of our production-related energy use – accounting for around 26 % of our global consumption in the 2018/19 fiscal year. Besides weaving processes, heat-setting is especially energy-intensive, particularly in felt production. The operation of machine tools consumes 6 % of the energy used at Voith. Due to higher utilization, a further 6 % of production-related energy consumption is accounted for by our foundry in São Paulo, Brazil.

Fact base Production-related Energy Consumption

Main Sources of Energy Consumption

in %



Main Source of Energy Consumption 2018/19

In the reporting period there was no real change in the proportion of direct (29 %) and indirect (71 %) energy consumption (previous year 29 % and 71 % respectively). With a share of 81 %, natural gas remains the key energy source for our direct production-related energy consumption, followed by LPG (liquefied petroleum gas), diesel, and heating oil with percentage shares in single digits. Among other purposes, we use these fuels for heating and heat-intensive thermal processes. Diesel is primarily used to operate backup generators and to generate steam at our locations in Karawang, Indonesia, and Shanghai, China, along with thermal processes in São Paulo, Brazil.

 **Fact base** Proportion of Direct and Indirect Energy

Energy Mix Further Improved

In the reporting year 24.9 % of the energy we consumed came from renewables, with 75.1 % from non-renewable resources. This represents a slight improvement compared to the previous year (2017 / 18: 21.5 % from renewables; 78.5 % from non-renewables). The previous year's figures and the value previously reported diverge due to a change in the scope of consolidation. This calculation includes all energy sources associated with our production-related energy consumption. Given our newly defined CO₂ targets and the associated ramp-up of our CO₂ management activities, we expect a further improvement in our energy mix in the coming years.

Fall in Electricity Consumption, Rise in Use of Renewables

In the reporting period Voith consumed 233,005 MWh of electricity (previous year: 237,354 MWh), a drop once again due to the improved efficiency of our production plants and processes. In terms of our electricity mix, the share of energy sources supplied by external providers was 44.5 % from renewables (previous year: 38.7 %) and 55.5 % from non-renewable resources (previous year: 61.3 %). We will be able to further improve our electricity mix by commissioning the aforementioned solar systems.

Furthermore, our newly formulated CO₂ targets provide an additional incentive to further increase the share of renewables. A range of regenerative power generation projects are already in implementation, or are at an advanced planning stage. Among them, projects for self-generation of solar power at Crailsheim and Sonthofen are already contributing towards this improvement with 950 MWh/a (300 t CO₂e/a), while the amount of self-generated renewable electricity more than doubled versus the previous year.

We are currently systematically examining at which locations it would be possible and economically feasible to implement additional photovoltaic projects, either now or in the future. In this regard, we are considering both the facilities we operate and those operated by third parties. However, as many of our locations have a relatively insignificant demand for electricity compared to other business groups, long-term power purchase agreements currently do not appear to be an alternative, owing to their high transaction costs. This is why we are increasingly examining the possibilities of focusing our purchase of electricity more on renewable energy sources through bundled or unbundled guarantees of origin.

In the reporting year we achieved significant improvements by purchasing green electricity. In Germany and China in particular, we are switching over an increasing number of tariffs. As supply contracts expire, we will continue to achieve significant improvements on our path to climate neutrality in the coming years. We also achieved significant improvements in our consumption of non-renewable resources, with a drop in coal-fired generation of 13 % and in electricity generated from natural gas of 4 %. Our purchase of nuclear power remained unchanged.

 **Fact base** Renewable Energies

 **Fact base** Electricity Mix

Climate Protection as a Corporate Goal

As a family company Voith has always taken corporate responsibility for its actions when it comes to the issues facing society at the time. This is why we aim to minimize the environmental impact of our business activities by constantly improving our energy efficiency. Our newly formulated environmental goals, our determination to achieve our CO₂ reduction target, and above all our aspiration to achieve net climate neutrality all reflect our intention.

Fact base GHG Emissions Recording Methodology

In the 2018/19 fiscal year our facilities' GHG emissions fell by 12.5 % to 128,703 t CO₂e (previous year: 147,035 t CO₂e). The share of direct GHG emissions fell by 3.2 % to 23,628 t CO₂e (previous year: 24,419 t CO₂e), while indirect GHG emissions also decreased to 104,035 t CO₂e (previous year: 120,047 t CO₂e).

Fact base GHG Emissions by Scopes

Fact base Specific Scope 1 and 2 GHG Emissions

Our energy-saving measures alone achieve annual GHG savings of around 6,000 t; however, differences in national electricity mixes as well as shifts in the mix of direct energy sources are causing the energy and GHG emissions indicators to diverge. This means that energy savings at individual locations, or even production relocations, vary in their impact on GHG emissions.

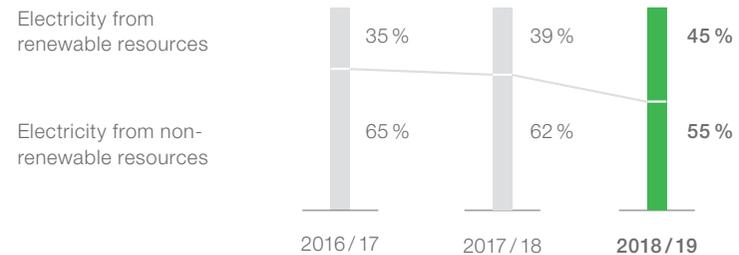
Production-related Greenhouse Gas (GHG) Emissions

total GHG emissions in t CO₂e



Electricity Mix Consumption by Resource Type

in %



At a number of Voith locations we are currently analyzing whether we can replace oil-based fossil fuels with gas-based fuels. Our Group Divisions are also looking for a suitable location for our first zero-emission site.

We also consider the challenges of climate change when developing products. From analyses of our products' lifecycle, we know that their environmental footprint is far greater when they are in use compared to their production stage. This is why we pay special attention to the way we develop our products. Indeed, Voith products regularly feature in the highest efficiency class. This way we support our customers in delivering their services in a more energy- and resource-efficient way. We thereby live up to our responsibility towards both our customers and society by helping to tackle climate change with our product portfolio. Furthermore, our hydropower solutions are contributing to climate-neutral power generation around the world. By gearing our technology roadmaps at Voith Turbo towards electric drives, we expedite climate-friendly mobility. Thanks to solutions from Voith Paper, we have enabled the paper industry to achieve significant cuts in its CO₂ emissions in recent years.

 **Fact base** GHG Emission Reduction Measures

 **Fact base** Emissions from Business Trips

 **Fact base** Emissions Trading

 **Fact base** Air Pollutants

2.2.2 Material Efficiency and Waste

At Voith, we intend to make our processes as resource-efficient as possible by managing our use of direct and raw materials across the Group. However, the breadth of our product portfolio and the correspondingly diverse process landscape present us with special challenges. Hence, we are simultaneously faced with a range of project business requirements at Voith Hydro and Voith Paper, as well as in mass production at Voith Turbo.

Material Efficiency Increased Again

In the reporting period we purchased approximately 198,000 t of materials from suppliers, a drop of around 8 % versus the previous year (215,000 t). The distribution in terms of the materials we purchased is as follows: 54 % semifinished products (previous year: 62 %), 32 % raw materials (previous year: 28 %), 11 % packaging (previous year: 8 %), and 2 % auxiliaries (previous year: 2 %). Since more wood was used for packaging, especially at Voith Turbo and Voith Paper owing to an increase in their business activities, the share of renewable materials increased year-on-year to 11 % (previous year: 8 %).

 **Fact base** Materials Used

In the 2018 / 19 fiscal year around 42 % of the materials we used were recycled. The recycled proportion was 60 % for auxiliaries (previous year: 60 %), 44 % for raw materials (previous year: 45 %), 33 % for semifinished products (previous year: 29 %), and 80 % for packaging (previous year: 80 %).

Using hot-spot or "Ishikawa" analyses helps us to continuously optimize our material efficiency. We utilize these analyses in line with our Excellence program, which provides us with key starting points for identifying improvement potentials in product development and engineering.

Higher Utilization Causes Waste Volume Increase

In the reporting period Voith generated 36,766 t of waste (previous year: 34,136 t), a year-on-year increase of 2,630 t or 7.0%. The primary reason for this was higher utilization of our foundry in São Paulo. Across the company, around 1,900 t more foundry sand was reported than in the previous year.

Consequently, in the 2018/19 fiscal year the increase in the volume of waste relative to sales increased once again, with the corresponding indicator rising to 8.6 t/€ million in sales compared to 8.1 t/€ million in sales the previous year. We therefore fell significantly short of our interim target for 2018/19 of 7.8 t/€ million in sales.

Fact base Waste Volume

In the reporting year the gains from measures already implemented rose from 8,596 t to 8,808 t (+2.5%), thanks in particular to process improvements which avoid the usage of cooling lubricant emulsion. The identified potential for action in the pipeline increased by 1.9% to 9,188 t in the reporting period. While more significant saving measures remain almost exclusively achievable as part of complex product re-qualification measures, the effort typically involved in the changeover must always be balanced against the resulting benefits. The measures covered relate mainly to material efficiency; the effects of make-or-buy decisions, or sales shifting to less waste-intensive processes, are generally not reflected.

Fact base Waste-saving Measures and Further Potentials

Wood, paper, and cardboard waste generally accounts for a high proportion of our waste. This is due mainly to packaging and making one-off production components safe and secure for transportation. Owing to the size of these components, it is not economically viable to transport empty packaging back for reuse – and even from

an environmental perspective, this is questionable regarding the transport emissions involved. In addition, owing to the high proportion of one-off and custom-made products from Voith, it is often not economically viable to use separate types of material-optimized packaging. Nevertheless, in the reporting period we again succeeded in increasing the service life of some of our packaging. At our São Paulo location, for example, wooden crates are reused wherever possible across the Group Division.

We will also continue to take a systematic approach to minimizing waste, starting right from the product design phase, since this is where materials are selected and production processes are defined; whereas in the later production stages, savings can only be achieved by reducing tolerances, oversizes, and quality improvements. Beyond the products themselves, auxiliaries such as oils and cooling lubricants offer additional starting points as well. If their service life can be extended by attentive management, the waste volume can also be reduced accordingly.

However, not every waste-minimization project makes economic sense, and not everything that brings economic benefits improves waste indicators. Indeed, the impact of a reduction in the oversizing of comparatively lightweight roll covers, despite the high savings potential in terms of process and material costs, is hardly noticeable in the waste index. At the same time, while the reduction in foundry sand improves the waste index, it generates significantly lower costs savings in terms of weight.

This is why the operational targets for reducing waste volumes and improving material efficiency are set by the EBM management teams in the Group Divisions, together with the locations. Consequently, the specific targets depend on local focus areas and the parameters that can be influenced there. Taking the example of oil- and water-based cooling lubricant emulsions, this can include the service life of the respective system before partial or full replacement.

Besides established methods such as recycling and waste-management workshops, in the reporting year we initiated a detailed material-flow cost analysis for a production area in Heidenheim to test the added value of this method based on a practical example.

Share of Hazardous Waste Virtually Unchanged

In the 2018/19 fiscal year we generated 1,667 t more non-hazardous waste and 963 t more hazardous waste than in the previous year. Our waste classifications remained virtually unchanged versus the previous year, with around 81 % of our waste deemed non-hazardous and the remaining 19 % classified as hazardous.

Fact base Hazardous Waste

The increase in hazardous waste is due to increased production utilization, particularly at our foundry in São Paulo, Brazil, which generates almost one-third of our hazardous waste. The collection of hazardous waste at Voith is regulated by internal guidelines, with disposal performed by external disposal and recycling companies – Voith does not transport any waste itself. We are pleased to announce that in the reporting period we were not notified of any violations of the law in relation to the disposal of waste by our external disposal and recycling service providers. However, in an isolated case at our York location in the USA we did report hazardous waste (PCBs) incorrectly. We took immediate action by initiating a series of measures, including a process to test for PCBs, to ensure this instance does not happen again.

Fact base Waste Disposal

2.2.3 Water

Water, and as a result wastewater, essentially play a lesser role in our production processes compared to other industries. Consequently, our minimum standards meet the respective legal requirements. Nevertheless, we analyze and manage our water withdrawal in the same way as our energy and material consumption: Water is an elementary and precious resource, and we are therefore committed to using it carefully. Water is also a key resource for our customers' processes, and we aim to support them with efficient solutions.

We distinguish between boiler feedwater, groundwater, and surface water. We try above all to reduce boiler feedwater consumption, also in order to relieve the local supply. Currently, we are pleased to report that our local withdrawal activities have no impact on the environment or on our stakeholders. If there were to be any, we would respond through our environmental incident reporting process, resulting in a thorough root-cause analysis and resolution.

Lower Freshwater Withdrawal

In the reporting period our freshwater withdrawal fell by 77,292 m³ or 7.5 % to 955,620 m³. Of this, we use around a third for cooling purposes only, which does not contaminate the water. In relation to our sales, our freshwater withdrawal fell year-on-year by 9 % to 0.25 m³ per € thousand in sales. The greatest driver for this improvement was the reduction in leakages at our Shanghai location.

Fact base Water Withdrawal

In the reporting period we reduced the volume of identified potential for action in the pipeline by 1.1 % to 806,404 m³ of freshwater, as not all planned measures proved to be economically feasible. In the same period, however, the gains from measures from the pipeline already implemented rose by 1.3 % to 799,123 m³ of freshwater.

With the overall reduction of 40.3 % achieved since the benchmark year, we are pleased to report that we have surpassed our 2021 / 22 reduction target of 40 %.

Fact base Freshwater Savings Measures and Further Potentials

We intend to continue improving upon the high level we have already achieved. Following many years of constant improvement, our efforts to reduce water withdrawal are increasingly declining in marginal utility.

We have always paid particular attention to the development of water withdrawal at facilities located in regions facing water shortages. This above all concerns our water conservation measures at our facility in São Paulo, which has been increasingly affected by droughts and water shortages in recent years. We are pleased to announce that the local situation eased somewhat in the reporting period. Furthermore, wherever technically and economically possible the local management team is striving to reuse as much water as possible with the help of our reprocessing plant.

In the reporting year we updated our 2011 study on water scarcity, the findings of which will feed into the planning of our future environmental goals. We utilize freely accessible databases such as WBCSD's Global Water Tool and WRI's AQUEDUCT when performing our analyses, retrieving all location-specific criteria offered by the tools. We factor in water quality and quantity criteria as well as regulatory frameworks. We also expanded our scope of analyses to include locations in known water-stress regions.

We identified the Voith locations with a significant water risk based on the general classifications of the respective tools. These will then undergo a detailed analysis to derive appropriate measures. Currently, we are still validating the findings – with an initial interim finding revealing that water stress is currently the highest at our Indian locations, followed by those in China and Indonesia, and then São Paulo and Dubai.

Based on the analysis, we are investigating whether and how we need to shift the focus of our measures, but it should be taken into account that our Indian locations currently only account for a low single-digit share of Voith's overall freshwater withdrawal. By contrast, the share of Chinese and Indonesian locations already accounts for around a quarter of our total consumption. However, numerous measures have already been implemented there, and the affected locations are now also subject to regular wastewater quality checks.

Continued Reduction in Wastewater

In parallel to our reduced freshwater withdrawal, we also generated less wastewater in the reporting period. At 821,902 m³ the volume of wastewater we generated was 2.6 % lower than in the previous reporting period (844,126 m³). Around 49 % (previous year: 38 %) was discharged into rivers, lakes, or the soil, while 52 % (previous year: 62 %) was discharged into the sewage system.

Fact base Wastewater by Method of Discharge and Quality

We use recycled water in our processes wherever it is appropriate economically, environmentally, and socially. This includes cooling processes (São Paulo) and processes in closed cooling water circuits (Garching, Summerville, Kunshan). We also operate our own wastewater treatment plants at our locations in São Paulo, Garching, and West Monroe. We work tirelessly to close water cycles wherever it makes economic sense – something we have since achieved in most cases.

In direct comparison to other industrial companies, our production processes only have a minor impact on water. Therefore, we are rarely required to measure water quality, with only a small number of locations required to take continuous or repeated monitoring measurements. However, the overall burden of BOD, COD, TSS, heavy metals, nitrogen, and phosphorus cannot be derived reliably owing to the low sampling requirements. In the reporting period we identified that our West Monroe location in the USA fell short of a BOD threshold value, so we took immediate steps to correct the respective water treatment process.

 **Fact base** Water and Neighboring Habitat Protection

Outlook

We intend to continue creating both environmental and economic added value through our activities. With our targets on sustainable development up to the 2021 / 22 fiscal year and beyond, we will continue on our successful path, for the benefit of both the company and the environment. By committing to our goal to become climate-neutral by 2022 we have reemphasized just how seriously we are taking this aim. To this end, in the current fiscal year we will systematically evaluate the photovoltaic potential of our locations and bring additional systems onstream.

3_Employees

3.1 Employees – Our Aspiration, Our Responsibility

Voith's greatest strength is our capable and motivated employees. We promote diversity in our company, which enhances our creativity, innovation and productivity. Our inclusive corporate culture is shaped by people from across the globe, whose cultural backgrounds and experiences reflect the broad spectrum of our customers around the world. Working in Voith's inclusive corporate culture, our highly diverse teams advance our innovative capabilities and generate new problem-solving expertise, enabling Voith to overcome even global challenges with confidence.

3.1.1 Voith as an Employer

At the end of the 2018/19 fiscal year the Voith Group's workforce stood at 19,410 (previous year: 19,535 employees), representing a year-on-year decrease of 0.6%. Around 56% of our employees work in EMEA, 20% in the Americas, and 17% in the APAC region. While employee numbers in Europe (+2.5%) and Asia (+1.2%) increased slightly, a challenging market environment in the Americas meant we needed to reduce our workforce there by 4.6%.

 **Fact base** Employee Structure

 **Fact base** Employees by Employment Type

A Company Fit for the Future

In an age of digitalization and rapid change, Voith's HR area has actively accepted the task of supporting our company and its employees in shaping cross-company collaboration in a future-oriented, change-ready way. Our newly designed HR strategy is designed to realize this aspiration, covering, for example, the development of digital skills and acquisition of new competencies that are vital in enabling us to meet the ever more volatile and complex market requirements of our modern service-based economy. This requires both individual and collective behavioral change – and therefore also collective cultural development. Since executives play a pivotal role

in such change, the HR strategy focuses on the areas of management competency and cultural development.

At Voith, much of our HR activity is distributed across four regional HR Global Business Service Centers. Bundling transactional processes and programs in these centers targets a high level of service provision and additionally allows us to pursue our aim of identifying activities that can be performed better digitally or through automation.

Number of Employees

in individual people



The reporting year was dominated by further service quality optimization. The regional HR Global Business Service Centers actively incorporated customer feedback in the restructuring of their services. In addition, improvements were made to accessibility and to target-group specific services.

An Attractive Working Environment

Voith enjoys an excellent reputation as an employer brand, as we combine the stability of a family company rich in tradition with the opportunities of a truly global player – one which is having a considerable impact on shaping the digital transformation process

in our industries. This is also repeatedly confirmed by external institutes, on ratings portals, and in employer rankings. In this regard, the reporting year was no exception, with Voith featuring highly in Trendence und Universum rankings.

 **Fact base** Voith in Selected Employer Rankings

Performance-based, Market-competitive Remuneration

Voith always aims to remunerate its employees in line with the market. We calculate remuneration in a gender-neutral way and based exclusively on professional qualifications and performance. Remuneration schemes and other benefits are in line with the prevailing market situation in each region. The analyses currently available to us, especially for the core countries of Germany, the USA, China, and Brazil, confirm this. At our German locations we routinely follow collective bargaining laws when setting remuneration levels.

 **Fact base** Expenditures for Employees

Our Global Job Grading project, which aims to establish a uniform job-evaluation system at Voith, came to a successful conclusion in the reporting year. Global salary comparisons are now possible thanks to this uniform Group-wide assessment of all non-tariff positions, laying the foundation for fair and market-competitive remuneration. Voith provides its employees with fair working conditions that comply with all statutory requirements. We reject all forms of forced labor and child labor, and we do not obstruct lawful employee representation. In the 2018/19 fiscal year 72 % of all Voith employees worldwide were covered by a collective bargaining agreement. The drop in comparison to the previous year (81 %) was caused by changes to the structure of the organization, due for example to the acquisition of companies.

 **Fact base** Details on Upholding Employee Rights

Diversity and Equal Opportunity

Our company's international nature is also reflected in the structure of our workforce. Employees from 93 different nations work for Voith, while the Voith Senior Management Circle also has an international composition, with 73 members from ten countries.

Voith deliberately promotes cultural diversity, thereby enhancing international collaboration at all levels of our company. In the fiscal year there were around 100 international secondments, enabling employees from different regions and of different nationalities to enrich their international careers. In order to further increase mutual understanding, tolerance, and communication skills, we offer our employees intercultural training and language courses.

 **Fact base** Diversity in the Management Team and in the Workforce / Employment Ratio of People with Disabilities

In October 2018 Voith signed the Diversity Charter, committing to create a working environment free from prejudice and to promote a culture of appreciation and diversity in the company. This aspiration is supported by our Diversity&Inclusion (D&I) program, which we introduced across our Group as early as 2012/13. We understand diversity as recognizing and embracing the uniqueness of our employees in the aspects of gender, age, nationality and ethnic origin, education and professional experience, as well as personal differences such as family status, social background, beliefs, physical abilities or sexual identity. We understand inclusion as the aforementioned culture of appreciation in which everyone is respectful towards one another. As a result, everyone can develop their potential freely and contribute different perspectives, ways of thinking, and approaches. We see respect as a prerequisite in enabling us to offer solutions even to more complex requirements, to our customers around the world on the basis of our employees' rich and varied experience.

Our D&I program requires all locations to introduce suitable measures in addition to taking a systematic approach to raising employee awareness. The regions are responsible for each focus area and implementation of the measures, while Group Human Resources coordinates the program. This ensures that we take a uniform approach across the Group, share best practice approaches, and also take into account the highly varied challenges we face worldwide.

Clear Statement against Discrimination

“As a company with a global reach, we work with employees and business partners of many different nationalities, cultures and ways of thinking. We do not tolerate unequal treatment (discrimination), harassment or derogatory behavior in violation of the law. In particular, we do not tolerate discrimination on account of race, ethnic origin, gender identity, religion or worldview, political orientation, disability, age, or sexual orientation.”

Our Compliance Committee monitors the implementation and enforcement of our Code of Conduct, ensures rights and laws are always complied with, and that employees' rights are upheld globally.

Mandatory awareness workshops for the upper four – in many regions, five – management levels help to continuously raise awareness among managers throughout the Group regarding D&I and draw attention to specific topics such as unconscious bias. This ensures that our managers assign great importance to D&I topics. A toolkit, available to managers in the Group's D&I SharePoint, provides ideas for activities and measures to make D&I part of daily working life and teamwork.

The toolkit also includes activities to help them reflect on their own management style, while a mandatory training module on D&I was introduced for those taking up management positions for the first time in all regions.

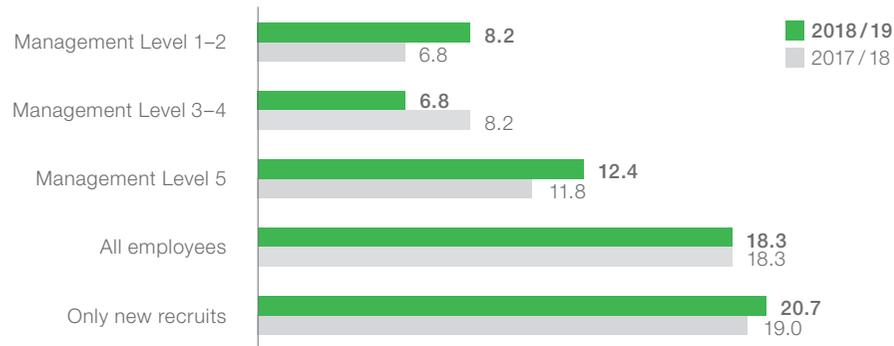
In the 2018/19 fiscal year, we held 14 training courses on the topic of D&I, with a total of 181 participants from 25 countries. In addition, in the reporting period, optional Awareness Workshops were made available to all employees in Europe. We also keep our employees updated through our global communication initiatives, which also include some interactive D&I campaigns, and make relevant information freely available on our company website. To learn together with other companies and to share experiences and best practices on the topic of D&I, we regularly take part in regional D&I network meetings and conferences.

As women are still underrepresented in technical apprenticeship occupations and higher education courses, we are also focusing on this area and working to increase the proportion of female employees further in our overall workforce. As at September 30, 2019, the proportion of women in the workforce remained unchanged at 18.3%. Around the world, we take a variety of measures to get girls and young women more interested in technical professions. We have participated for many years now in Girls' Day and are involved in the initiative “Women in MINT Professions”, run by the State Ministry of Baden-Wuerttemberg for Economic Affairs, Labor and Housing Construction. This initiative aims to encourage more girls and women to take up MINT professions, as well as to increase career opportunities for women, including those returning to work.

Increasing the proportion of female managers in the company is particularly important to us. In the Voith Senior Management Circle, the proportion of women currently stands at 8.2% (previous year: 6.8%). In our middle management circle, the proportion of female employees has risen to 12.4% (previous year: 11.8%). We are well aware of the need to take further action in this respect. This is why we have initiated a range of measures, such as a mentoring program for women and the Women Networking Day in China: Alongside our D&I program activities, in future this will serve to attract more women to management positions.

Percentage of Women by Management Level

in %



Balancing Work and Private Life

At Voith we see ourselves as a family-friendly company – an understanding that is embedded in our Group-wide guidelines to provide a flexible and family-conscious work culture. Through ongoing communication measures, we work to increase our managers' openness to this issue. After all, our stated goal is to offer our employees an attractive working environment. This also includes flexible working models to help our people meet ever-changing personal life circumstances.

Fact base Flexible Working Models

61 % of our employees – the majority of Voith's workforce – are able to organize their working time flexibly to a great extent. In consultation with their supervisors, many of our employees can agree personal working time models, ranging from the use of flextime, through to part-time work, job sharing, sabbaticals and mobile working. In Germany, for example, release from work for training is governed by collective agreements. In connection with this, in 2018 an agreement was reached with the Works

Council to introduce part-time training leave in the company. In an "active" phase, this allows employees to work for reduced remuneration. In a following "passive" phase, employees can utilize the time available for vocational training and continue to be remunerated.

Fact base Parental Leave

Employee Satisfaction

We always keep a close eye on our employees' satisfaction. Our employee turnover rate fell in the reporting period to 9.9 % (previous year: 10.3 %). 3.9 % of this rate (previous year: 4.3 %) is due to employees terminating the employment relationship. As part of exit interviews we ask them why they are leaving Voith, and evaluate this feedback to identify potentials for improvement.

Fact base Employment Length

Fact base Employee Turnover

3.1.2 Attracting and Promoting Talent

The competition for suitably qualified employees is getting tougher in many areas, and we constantly face the challenge of attracting qualified employees at all our locations. A differentiated approach in our HR marketing activities is intended to make our efforts in this area even more successful.

Interested parties and applicants can find out more about the company and opportunities with Voith on our website. We increasingly employ social media recruitment campaigns as part of our HR marketing activities. Using social networks enables us to specifically target interested candidates. Online advertising campaigns are also a good way to gain broad reach and raise awareness.

We continue to face particular recruiting challenges in the Field Service area owing to demographic changes, particularly in Europe, as well as the changing requirements

of potential applicants in relation to their work activities. We continue to develop new solutions and measures to meet these challenges.

Fact base New Hirings

High Aspiration – High Level of Training

By tradition we are committed to providing world-class vocational training. Our commitment has remained steadfast for over 100 years. Interdisciplinary learning and the integrated provision of social and specialist expertise are high on the agenda. Furthermore, we typically take on our apprentices on completion of their vocational training, and offer them the opportunity to get their foot on the career ladder in our company.

Voith trains employees around the world. To do so, we utilize our own Training Centers in Heidenheim and Kunshan (China). Our international locations also deliver vocational training that, while based on the German dual-study system, also incorporates cultural and country-specific considerations. The success of this approach is illustrated by our experiences at our São Paulo (Brazil) location, where we have been training young people for many years. In collaboration with local training institutes, we have developed a training model for a typical two-year apprenticeship aimed at young people from around the age of 15. This approach regularly produces exceptionally well qualified new technical talent.

As at the end of the 2018/19 fiscal year, Voith employed 838 apprentices and students (previous year: 801). 534 (previous year: 519) of our apprentices work in Germany, over half of whom work in Heidenheim (326; previous year: 302). While we expect the number of apprentices to remain at a similarly high level in Germany, we forecast a shift towards dual-study programs.

Fact base Apprenticeships and Opportunities

As part of our efforts to strengthen the skills of employees recruited to the Field Service area, all technical apprentices now complete at least one placement in Field Service.

Our Social Internship program, launched in 2017, was continued in the reporting year. As part of this, all apprentices in their second year of vocational training spend one week at a sheltered workshop for the disabled. In return, disabled employees from the workshop visit the Voith Training Center, where they complete a multi-level occupational safety training program. In addition, apprentices accompanied by trainers helped to build a training workshop in Nepal.

A team made up of apprentices, dual-study and Special Vocational College students proved successful in the Germany-wide “Diversity Challenge” competition. The Voith team was commended for its engagement with diversity in the workplace.

Advancing digitalization is also bringing lasting change to vocational training requirements. In Germany we are meeting this challenge at various levels. One focus is the development of interdisciplinary competencies such as additive manufacturing processes using 3D printers.

Lifelong Learning – Both a Right and a Commitment

In times of dynamic change driven by technological progress, we expect our employees to be committed to lifelong learning. This is why we support them with a comprehensive range of training and education measures. Our leadership concept sets out the framework for this, with numerous management tools. A performance objective meeting is held at the start of the fiscal year between every employee and their supervisor to discuss and set the individual’s contribution to achieving our corporate goals.

The employee appraisal focuses on work activities and the working environment, the relationship between the employee and supervisor, and the employee's own personal development perspectives. The outcome of these meetings is entered in our pep. HR IT system, together with findings of the Management Review process. This approach means we are always aware of our employees' training requirements, and can tailor our offerings and initiate personal development measures accordingly.

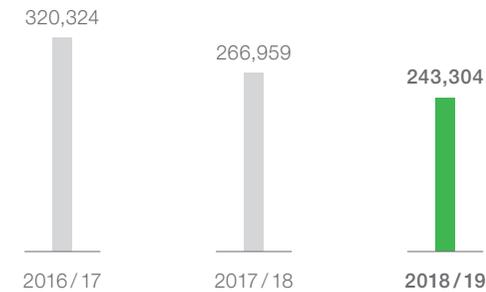
In the reporting period 92.1 % (previous year: 91.4 %) of Voith employees took part in an employee-supervisor appraisal. In doing so we reached all employees who were not prevented by sickness, on parental leave, or who were exempted from the appraisals as they were about to take on new functions. Over the course of the next few years we plan to further stabilize the high level we have already achieved.

 **Fact base** Training and Education & Career Development

The development of our executives is of great significance within the overall strategy of our training and education measures. Special development programs establish a uniform understanding of management within the company across Group Divisions and regions. These programs are mandatory for all executives with supervisory roles.

Since 2018 our DRIVE platform has given all our employees the opportunity to gain an understanding of digitalization in a hands-on, playful way. This allows them to acquire basic digital skills, enabling them to develop a digital mindset that they can put to use in the organization. We are also promoting topics such as agile working at Voith, especially in project management where we are introducing approaches such as scrum wherever appropriate. All these measures are progressively increasing digital expertise within our organization and making Voith fit for the future.

Hours of Further Education



Regarding professional competence, Voith offers a comprehensive range of training programs in the areas of leadership, social and methodological skills and specialist knowledge. At the Voith Academy, for example, executives from around the world come together to gain Voith-specific knowledge and to share their views on leadership issues with colleagues. We offer functional training models for sales and product management as well as programs for specific Group Divisions such as PaperSchool. Using a train-the-trainer format, we achieve a high level of internal participation in knowledge transfer. Our training offer encompasses the whole spectrum of formats, from classroom to e-learning.

In the 2018/19 fiscal year our employees completed an average of 12.3 hours of training and further education (previous year: 14.0). We are working tirelessly to improve our training program, which is why we ask participants about their experiences

after each training course, and provide the findings to the trainers and the HR area. In addition, the supervisor's assessment is obtained as an appropriate means to assess the success of a measure.

Outlook

Consistently attracting the right number of well-qualified employees and retaining them in the company will remain the key challenge for our HR work at Voith. At the same time, employees still need to be prepared for the increasingly digital world of work and supported in their development. As familiar qualification measures alone are no longer enough, our goal now is to create a culture of agility and a willingness to embrace change through a systematic approach to change management. This is why we will offer an increasing number of training courses to enable our employees to easily find their footing in the digital world. With this approach we are already laying the basis today for our future success.

3.1.3 Occupational Health and Safety

Occupational health and safety take top priority at Voith. By taking a responsible approach when designing workplaces and processes, we work to prevent accidents and work-related illnesses as far as we can. Our established HSE (Health, Safety, Environment) organization provides the best basis for this. In addition, our systematic approach to implementing our Shared Services structure ensures that individual locations and regions receive the most comprehensive support possible. To reach our internal customers even better, in the reporting year we converted the organization to a decentralized structure. This will not only improve our on-site presence, but will also enable us to provide specialist support with a more intensive focus on products. We have implemented corresponding processes to identify occupational health and safety hazards and risks. These are transparent to everyone involved, all information can be accessed within one system, and lessons learned can be shared between business areas.

A Group Directive sets out the requirements and responsibilities for effective occupational health and safety, and lays down binding minimum requirements and standards for the Group. It also includes all standard operating procedures (SOPs) on HSE at Voith. In principle, while all locations are covered by this Directive, the more stringent provision in each case always applies when reconciling the regulations with regional requirements. As a third step, customer agreements are binding if they impose stricter or more specific requirements. All Group Directives are currently being reviewed and amended where necessary to ensure that their contents are up to date and consistent with the new organizational structure.

For several years now Voith has been using our Group-wide hse+ IT system to manage HSE. The system is now increasingly being used by our smaller organizational units. As a fundamental principle we attach great importance to the early involvement of Data Protection Officers in all issues relating to HSE reporting, controlling, and communication. All occupational health and safety policies are accessible globally via this system, just like our environmental protection regulations. Moreover, the majority of countries can enter relevant laws and regulations directly in the system and assign the resulting responsibilities to those accountable.

We launched a new "Environmental Risk Assessment" tool in 2019, in parallel to the risk assessments for people, activities and business areas. This allows the diverse hazards at our locations to be identified objectively and documented appropriately. As with the other risk assessments, actions can be assigned and their implementation tracked.

We are also well prepared for the upcoming transition from OHSAS 18001 to ISO 45001. For example, thanks to ongoing improvements in the reporting year the number of identified nonconformities further increased, laying a key basis for a successful migration.

Joining Forces with Employee Representatives

Company agreements on occupational health and safety, as well as on preventing addiction, complement the regulations embedded in our HSE Group Directive. A monthly Safety Committee Meeting brings together all employee and employer representatives at each production location to develop the annual occupational safety program and implement it in monthly actions.

 **Fact base** Employee Representation in Committees

Occupational Safety

In 2009 we anchored accident frequency and severity reduction in our corporate goals. Over the past few years we have made constant improvements in this area, making Voith one of the world's leading companies – across all industrial sectors – in occupational safety.

This is confirmed by the Accident Frequency Rate (the number of notifiable accidents per 1 million working hours), which we calculate according to the international standard. We reduced our AFR very significantly from 12.6 in the 2008/09 fiscal year to 1.5 in the reporting year (previous year: 1.5). This corresponds to 54 notifiable accidents (previous year: 52) – still a particularly low figure compared to other industries. By comparison, the average AFR of companies in the Professional Association of Plant and Mechanical Engineering is 22. However, in the reporting year we again suffered an increase in the Accident Severity Rate (ASR): With 364 working hours lost per million in the reporting year (previous year: 342), the previous year's value was exceeded once again. There were no fatal occupational accidents in the reporting year.

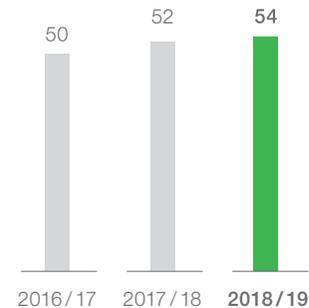
 **Fact base** Occupational Accidents

Frequency Rate

specific figure in accidents
per 1 million working hours



Number accidents

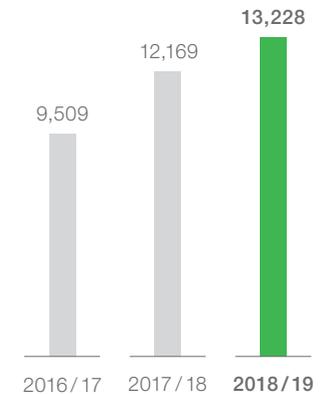


Severity Rate

specific figure in lost hours
per 1 million working hours



Number lost hours



Extensive Occupational Safety Program

Our occupational safety program fundamentally includes every employee. We also involve service providers in occupational safety activities through our “Coordination of Visitors and Contractors” Occupational Safety Directive.

Executives with supervisory roles have a particular responsibility in this regard: They are responsible for risk assessments, as nobody knows the technical requirements or the level of education and experience of their employees better than they do. Furthermore, executives have a clear duty to ensure that information and targets are cascaded as prescribed, from the Board of Management, through the respective executives, all the way to shop floor level. Employee training and the active communication of key developments also fall within their area of responsibility. Employees must be given documented instruction at least once a year, with centrally prescribed training documents supporting this process. To lend a helping hand, our health and safety specialists provide assistance with queries on using our hse+ software as well as with other HSE-specific enquiries.

Besides annual instruction, brief summaries are published regularly, sometimes even daily, on HSE issues, and information sheets are made available on selected topics. This system of repeated instruction and information has proved successful in raising employee awareness for the long term. For example, in the reporting year we produced and sent specific information on the operation of work equipment such as cranes. We also addressed other topics such as hand injuries, and approached these by means of a poster campaign.

We continue to work intensively on using our HSE software for online instruction, even though we in no way see this additional medium as a replacement for supervisor-led, face-to-face instruction. Individual business areas are also increasingly switching over to the online delivery of training courses tailored specifically to their needs,

some of which they have developed themselves. Online training courses have proved particularly effective in communicating information globally and in a timely manner to both office-based and Field Service staff.

We raise our production employees’ awareness through short, high-impact information sessions. Beyond the annual instruction we provide, these five- to ten-minute presentations on current topics keep aspects of occupational safety firmly in employees’ minds as they carry out their daily work. In some cases, employees are involved directly in these presentations – if they are involved in a private or voluntary capacity in the Fire Service, for instance, meaning they are highly credible when presenting fire safety topics.

We document instruction sessions that are required by law. Here too, we are increasingly providing them as online tutorials – especially since pilot projects have met with a positive response in recent years. We will therefore progressively start offering online tutorials on various topics via our hse+ software, with our initial focus areas being decentralized organizations such as site construction, service and sales employees, and administration.

We place particular emphasis on training our experts in the regional HSE organization. They have already been rigorously trained on the use of hse+: We have used this online system at Voith since the 2015/16 fiscal year to display information globally, uniformly, and transparently on audit planning and audit results, as well as key information on hazardous materials, compliance, and risk assessments. Over the next two years we plan to make sure our people worldwide use as many hse+ modules as possible and just as intensively. Furthermore, we intend to further expand the documentation and follow-up of measures derived.

Special Responsibility with Field Service

When on construction sites or service calls, Voith Field Service employees take responsibility for occupational safety and environmental protection in a wide variety of ways – whether as supervisors without authority over other service providers, right through to taking full construction-site responsibility that includes authority over subcontractors. Due to the organizational reclassification of the HSE experts into the Group Divisions, the cross-divisional working group “HSE in Field Service” was disbanded. The corresponding topics are now once again handled by the specific Group Divisions.

Documenting, Analyzing, and Preventing Accidents

At Voith we record all accidents centrally to ensure that the direct supervisor is reliably informed and that the notifications can be published on the intranet. This also ensures that the Corporate Board of Management is informed within 24 hours in the event of serious incidents. Investigation teams, comprising stakeholders, supervisors, and safety experts, review and document the accidents. Especially serious accidents are examined separately once again at our Center of Competence HSE. A detailed description of accident definitions is given in our Group Manual; these are then presented in a way that makes them comparable internationally with other companies.

On the basis of analyses carried out in the previous year, we were able to improve the quality of incident investigations in the 2018/19 fiscal year. Unsafe situations and the potential influence of the respective managers were also scrutinized. The corresponding findings contributed to the newly-developed occupational safety training course for managers. Voith's own eVAP app involves employees actively in accident prevention. It enables them to log potential accident causes quickly and easily on the spot, and then sends this information to a central database. Clear icons facilitate the entire user interaction within the app. The data is analyzed automatically and then published in target group-specific media along with corresponding instructions.

This allows us to raise our employees' awareness of unsafe actions and situations before accidents occur. In addition, increased data quality across sectors and countries makes even more targeted prevention work possible.

Usage of the app shows a positive trend. Our HSE experts received an average of 423 reports each month in the 2018/19 fiscal year, around 20 % more than in the previous year. Following the Group-wide roll-out of eVAP we are now in the process of adding further smaller app modules. Our aim is to achieve further improvements in the number of audits performed, as well as in terms of the quality of the content.

Using accident analyses, audits, and other measures we make sure we are always up to date in terms of HSE, and can take immediate action in response to serious accidents, or if specific accident types occur frequently. Our global HSE Flash News on the accident/incident focus areas in occupational health and safety and environmental protection enables us to inform the affected employees immediately and directly.

Routine Communication on Safety Matters

We employ several communication channels to keep every employee across our Group updated on changes and developments. Besides fortnightly conference calls, the Safety Steering Team also meets annually in two regions, ensuring a rigorous internal and external information exchange and discussion. Safety matters also play a central role in the meetings of the newly-created HSE Quality Board.

Following this, meetings are held at a regional level to communicate the points discussed. In turn, this information is then shared with the individual locations in the monthly occupational safety working groups. The local experts are also responsible for translating the guidelines and standards into their respective languages. Centrally produced publications, such as the regular HSE and EBM Newsletters, complement our information offering.

Outlook

We intend to maintain this high level of occupational safety, with our hse+ IT platform playing a key role. It enables us to further improve the transparency of our actions and to implement measures in a more targeted way. In the current fiscal year, together with the suppliers of the software we will continue working towards establishing a uniform quality level throughout the Group. To achieve this, we will roll out the same modules globally and, in conjunction with employee motivation measures, make rigorous use of these modules. Once again, our activities will focus on crane operation, as accident statistics show a clear need for a greater provision of information in this area.

Occupational Health

Regardless of where our employees work, we want them to stay fit for work and retire healthy at the end of their professional lives. From our analyses we know that the statutory frameworks and cultural differences in the respective countries also require different emphases within occupational health management. This is why we pursue a consistent, region-specific approach to occupational health protection in which our fledgling Group Division Voith Digital Ventures is fully integrated.

In the reporting year we continued to work on focus areas. To assist with these activities we conducted a pilot project on the topic of health management in our Group Division Voith Turbo at five locations in Germany. The project covered sick-leave analyses, company inspections, structural analyses, and employee surveys as part of one-to-one interviews and group workshops. The objective was to identify factors that

have a positive or negative impact on motivation. Based on these, location-specific and additionally Group-wide guidelines were developed in parallel in seven specific fields of action. The workplaces we examined were found to be ergonomically well equipped, with a prevailing climate of partnership and cooperation in their teams. Our next step is to develop and establish an overarching health management organization prior to defining specific activities for each of these fields of action. We are also focusing on communication between individual teams as well as between managers and employees. Here, it is particularly important to create a deeper understanding of their respective performance indicators and to work towards the creation of an error management culture. To continue driving these topics forward, we have established health working groups comprising management, HR, Occupational Health and Occupational Safety representatives. At a higher level there is a central steering group with representatives from Occupational Health and HR, which acts as a provider of stimuli and builds a network between the Health working groups at our locations.

Illness and Stress Support

For the reporting period we are pleased to announce that we achieved further improvements in occupational medical care at our German locations. Thanks to our cooperation with an external service provider, our employees in Germany can obtain information and support relating to the care of family members and childcare. We are currently continuing to work on establishing robust illness and stress-support processes at our locations. Once this is done we will, as far as permissible under data-protection legislation, roll out a central reporting system on this topic.

4_Products and Supply Chain

4.1 Product Responsibility

4.1.1 Management Approach

Voith products and industrial services serve five major markets around the world: Energy, Oil & Gas, Paper, Raw Materials, and Transport & Automotive. As these markets impose wide-ranging requirements on our company, we ensure our solutions are just as varied to meet them.

Our Responsibility – Our Fields of Action

Given the diversity of our product portfolio and the very different market requirements we face, our Group Divisions are confronted with a broad spectrum of challenges regarding product responsibility. To identify these demands systematically and evaluate them in terms of their materiality, we draw on the results of our stakeholder survey of early 2016. We also evaluated external benchmarks, including those of the IÖW (German Institute for Ecological Economy Research) and ISS ESG.

In conjunction with our Group Divisions' evaluations and assessments, we defined the material fields of action for our company with regard to product responsibility as follows:

- Quality and reliability of our products and services
- Guarantee of maximum product safety
- Long service life of products
- Technological expertise and innovation
- Customer dialog and cooperation
- Product resource efficiency
- Minimizing products' environmental impacts.

Foresight Project Successfully Completed

We always aim to be prepared to meet long-term challenges and trends, and to harness growth opportunities. To this end, in 2017 we launched the Technology

Foresight project. This was successfully completed in the reporting period in all Group Divisions. Led by the Divisions' respective Chief Technology Officers (CTOs), we developed future scenarios for water, paper, mobility, and the environment extending right through to 2040. Key technologies and potential business segments were identified and prioritized. Gap analyses subsequently provided the foundation for the formulation of specific technological goals. These were converted into technology roadmaps that led to specific development projects.

In this process, the megatrends of decarbonization, digitalization, and the circular economy play a central role, shaping the future scenarios derived in each of the Group Divisions and then feeding into each Division's definition of its strategic objectives.

- **Megatrend Decarbonization:** Voith wants to contribute to decarbonization and the achievement of the Paris Climate Agreement goals. To this end, we continue to rely on promoting hydropower as a renewable energy source, to deliver paper production facilities that make efficient use of resources, and to work on systematic drivetrain electrification as well as alternative drives to facilitate eco-friendly mobility.
- **Megatrend Digitalization:** Voith intends to capitalize on digitalization as an opportunity, and combine our longstanding automation and IT expertise with hydro-power, paper-machine, and drive technology know-how. In our core business we develop customer-oriented solutions that drive forward digital transformation in key global industries.
- **Megatrend Circular Economy:** We will drive innovation that contributes to closing cycles in our industries, thus promoting the principle of the Circular Economy. Selected findings of the Foresight project are outlined in this report, in the section headed "Product Responsibility by Group Division". In future, the scenarios are to be regularly reviewed and adjusted as necessary. In addition, the scenarios, operational objectives, and key indicators developed within the project will be leveraged in an ongoing, uniform, company-wide Foresight process.

Research and Development

Our success largely hinges on our technological expertise and our ability to constantly apply our know-how in innovations that generate added value for our customers. This is why research and development (R&D) has traditionally been a high priority at Voith, and why we continuously invest in our future: In total, over the last five years we invested over €1 billion in R&D activities, including €213 million in the reporting year (previous year: €222 million). At 5.0%, the share of our Group's sales dedicated to R&D was slightly below the previous year's level (5.3%). Voith holds several thousand active patents around the world, with hundreds of new ones added to our portfolio in the reporting year.

 [Annual Report 2018/2019 p. 24 f.](#)

 [Fact base R&D Expenditure](#)

Collaboration Projects with External Partners

Voith's Group Divisions are market and technology leaders in many business segments. For this reason they are in constant dialog with research institutes, universities, associations, and other companies along the supply chain. Here too, sustainability issues play an ever more prominent role.

The Group Division Voith Hydro is working with Siemens on the development of hybrid power concepts, for instance. The goal is to be able to advise customers in an early phase of projects on the cost-effectiveness of a power plant fleet consisting of wind, solar, biomass, battery-storage and hydropower plants. Working with the Leibniz University of Hanover (LUH), Voith Hydro conducted experimental and theoretical studies on loss mechanisms in an independently excited hydropower generator. For research purposes, Voith Hydro provided the university with a realistic model of a hydropower generator. In addition, Voith Hydro is participating in various EU projects,

such as with FiHydro on the development of technologies to improve permeability and therefore the chances of survival for fish in hydropower plants. Voith Hydro also works as a consortium member in the EU project XFLEX HYDRO, which aims to make better use of the flexibility of hydropower to help integrate wind and solar power into the European power system, and to further advance decarbonization by increasing the efficiency of hydropower plants.

The Group Division Voith Paper is currently in dialog with 45 universities, associations and companies, and working on specific projects with almost half of these partners. Collaboration with external partners is very helpful, particularly in areas where fundamental knowledge has to be created at the outset. This applies to customers and other partners along the Paper value chain as well as to universities. An example is Voith Paper's commitment to the model paper factory, a consortium project dedicated to researching and rolling out CO₂-neutral paper production. Voith Paper is also active in the Energy Solutions Forum of the Confederation of European Paper Industries (CEPI), and is a partner in the Matlam/Celuwiz project at the Centre Technique du Papier in Grenoble, France, developing fiber-based solutions for biodegradable barrier packaging.

The Group Division Voith Turbo has expanded its collaborations. In the area of e-mobility, the Division is already working with various universities, such as the Munich University of Technology and RWTH Aachen University, aiming to further increase the competitiveness of low-emission drives. In collaboration with the Fraunhofer Institute, Voith Turbo is additionally working on the development of sensor technology for non-contact temperature measurement in rotating systems to ensure optimal and problem-free operation of hydrodynamic couplings. Voith Turbo is also working with Clausthal University of Technology on the development of low-loss bearings to increase efficiency and save energy, while its collaboration with Ulm University is focused on the "Range Extender for Battery-operated Electric Vehicles".

Customer Dialog

Maintaining close customer relationships and a deep understanding of customers' needs has always been one of Voith's strengths. All divisions are in constant contact with their customers, and they are also included in Foresight-related activities and trend analyses. This contact also includes targeted surveys, for instance on customer satisfaction or future requirements on our products' capabilities. At the same time, digitalization is playing an increasingly important role in our Group Divisions' customer communication activities. In this regard, we aim to improve both our own and our customers' understanding of digitalization in equal measure, and in doing so give our customers the edge through increased interconnectivity and the intelligent combination of industry know-how with analysis and IT expertise.

An example: Resource savings, whether in terms of fibers and other raw materials, water, wastewater, or energy, are central topics within Voith Paper's customer dialog activities. In addition, an ever-increasing number of customers ask us for detailed information such as on individual materials used in the product manufacturing process. And from a consumer perspective, environmentally friendly packaging, in which for example more paper is used than plastic, matters a great deal. This also influences the requirements on paper production. Voith Paper employs the Net Promoter Score (NPS) methodology to measure customer satisfaction.

4.1.2 Reliable and Safe Products

Voith is renowned the world over for the safety, quality, and reliability of its products. We are fully aware of the value of this important competitive advantage, so we have set out the principles of our quality and technical risk management processes in Group Directives. Our Group Divisions and their companies then expand on these principles and supplement them accordingly.

In this way, the bases of the Voith Paper quality management system are set out in guidelines, process descriptions, and work instructions. Necessary reviews and corresponding documentation are controlled via internal ERP (enterprise resource

planning) systems. Potential health, safety, and environment impacts are taken fully into consideration. Various tools such as Ishikawa, FMEA (failure mode effect analysis), and A3 or 8D reports are used to continuously improve the processes.

We document and certify our activities according to the international ISO 9001, IATF 16949, and ISO/TS 22163 quality management standards, as well as ISO 14001 for environmental protection and ISO 45001 (formerly OHSAS 18001) for occupational safety; we also supplement these with many of our own QM methods. Virtually all Voith locations are certified to at least one of these standards.

With the help of clearly defined project scopes, a Group-wide Quality Excellence initiative places an even stronger focus on the quality of our products and processes. The aim here is to continuously improve quality while reducing associated costs. To achieve this we focus on four core projects: Quality-cost Transparency, Problem-solving Methods, Continuous Improvement Processes, and Quality in Engineering.

Uniform KPIs across the Group enable benchmarking within both the company and the relevant industrial sectors. The corresponding performance indicators are regularly reported to the Corporate Board of Management. The high level of importance placed on Quality by all Voith business areas is again underlined by the establishment of the new Quality and HSE/Sustainability Board.

EU Directives Define Minimum Requirements

Voith products always meet the statutory and regulatory requirements of the countries we supply. EU directives, such as Machinery Directive 2006/42/EG, form the basis for the minimum requirements for product safety worldwide. Our Group Divisions are responsible for implementation, while the relevant Quality Assurance Departments ensure process compliance.

Our quality management system also defines how to fulfill the respective statutory product documentation requirements, and how products are to be labeled. Besides

internal technical documentation, operating instructions provide information on the intended use of our products and on how to handle them in a technically and environmentally safe way. Our quality management system also outlines procedures for decisions that entail risks.

We regularly train employees on how to handle the corresponding regulations, and make these available to them via our Group-wide databases and internal communication channels. In addition, we provide our customers with the relevant know-how through training courses held either at our training center or directly onsite at our customers' locations. For example, Voith Hydro employees receive regular training in applying the relevant regulations, available to them via our Group-wide database and internal communication channels. Furthermore, as part of the Voith HydroSchool, Voith Hydro provides its customers with the relevant know-how, either at its own training center or directly on the customers' premises.

At Voith Turbo too, all employees are also trained on quality issues and ensure learnings are thoroughly implemented. Several quality programs are currently running in this Division to increase product and service reliability even further throughout the lifecycle. At the same time, Voith Turbo consistently seeks a close relationship with customers to allow experiences from daily system operation to be incorporated into its product development activities.

We evaluate the effectiveness of our quality assurance measures in our respective Group Divisions using division-specific KPIs as well as internal and external audits; our suppliers are also closely involved in these activities.

A key quality of Voith machines and systems is their long service life, which is why Voith Turbo gear systems and Voith Hydro turbines have been in reliable operation at hydropower plants for decades. Our paper machines have a similarly impressive track record. Because of this, our Group Divisions are committed to supplying spare

parts even after many decades of operation. Providing customer-oriented service well into the future is a key requirement we factor in, right from the development stage. Furthermore, Voith engineers are constantly tasked with supplying spare parts for third-party components – such as for transmission units produced by competitors that are no longer active in the market – to enable our customers to continue operating a full system.

 [Fact base Nanotechnology](#)

 [Fact base Approach to Handling and Eliminating Suspicious and Hazardous Materials](#)

4.1.3 Product Responsibility by Group Division

By constantly further developing our products we aim to make them more environmentally and resource-friendly throughout their lifecycle. In doing so, we meet our customers' demands, statutory requirements, and last but not least our own aspiration. The primary aim of all Group Divisions is therefore to conserve resources and to minimize the environmental impact of our products. To achieve this we follow a decentralized management approach.

We predominantly supply components that, as part of an overall system, have differing energy and material footprints. We employ a range of tools to gain an even more detailed picture of our products' energy and raw-material efficiency: Among these, we have conducted product Life Cycle Assessments (LCAs) for many years now in accordance with ISO 14040 and 14044. However, as Voith products are often not serially produced, LCAs are not carried out for every product. With projects, as a matter of principle the respective sustainability impacts are critically analyzed as part of the internal risk assessment before the submission of tenders. We expect a further tightening of environmental protection legislation for all Group Divisions as well as a continual rise in customer demands regarding the environmental and resource efficiency of our products.

With our broad product portfolio and our active role in a variety of markets, we constantly face the challenge of producing a balanced account of our activities in a uniform, standardized report that covers all Group Divisions. By way of example, in the following we have outlined the lifecycle of a main product of each Group Division that also shows its environmental and social impact.

Voith Hydro

The Group Division Voith Hydro develops customized, long-term solutions and services for hydropower plants across the globe. Its broad portfolio of products and services covers the entire lifecycle and all essential components of hydropower plants of any size – from generators, turbines, pumps, and automation systems to spare parts, maintenance and training services, and digital solutions for intelligent hydropower plants.

Product Group	Share of Revenue of Group Division (%)
Components for large hydro (including refurbishments)	57 %
Components for small hydro (including refurbishments)	18 %
HyService	15 %
Automation (including digital products)	10 %

Targeting Minimal Environmental Impact

Voith technologies play a decisive role in minimizing the environmental impact of hydropower plants – from improving water quality through aerating turbines, and oil-free hubs that prevent water contamination, through to innovative runners that improve fish passage through rotors. Voith Hydro also works tirelessly to further minimize the remaining environmental impacts.

Voith Hydro also aims to install new hydropower plants at existing dams and weirs to generate renewable energy growth without further environmental impact on the

Life Cycle of a Hydropower Plant and the Contribution of Voith Hydro Components



1. Planning Phase/Supply chain

- Environmental and social acceptability checks
- Stakeholder engagement
- Reduction of supply chain risks (see GPC and CoC)

2. Creation (Hydropower Plant Construction Phase)

- Management of social and environmental aspects
- High global safety and quality standards
- Technical customer training courses on optimal environmental and economic operation (HydroSchool)

3. Utilization Phase (Electricity Generation) – VH Products/Services Can Improve:

- Efficiency and durability
- Operation and cost-effectiveness
- Environmental impact and integration of renewable energy sources into the grid
- Extension of the use phase by modernizing the equipment

4. End-of-Life

- High proportion of reused products

immediate surroundings. Using our StreamDiver solution, small-scale hydropower plants can be installed at existing irrigation dams even where strict environmental regulations apply. Protecting the environment is also increasing public acceptance of hydropower, resulting in reduced implementation times for new plants and modernization projects.

 **Fact base** Further Information on Social and Environmental Impacts – Voith Hydro

Hydropower – Renewable Energy Source par Excellence

Voith Hydro is active in hydropower, the largest renewable energy source for power generation worldwide. As a proven, mature, predictable and competitive technology, it combines an unrivalled level of efficiency with an extremely long and reliable plant service life as well as low CO₂ emissions.

The significance of hydropower can be demonstrated by the commonly-used energy indicators Energy Payback Ratio (EPR) and Energy Return on Investment (EROI). These are calculated by dividing the electricity output during the normal service life of a system by the energy required for its construction, maintenance and operation. A high EPR is an indicator of a highly energy-efficient system. Scoring 267 (for run-of-river plants) and 205 (for storage plants), hydropower has the highest EPR of all methods of power generation. In comparison, fossil fuels achieve a value between 3 and 11, large wind farms 39, and nuclear power a value of 16.

Voith Hydro's product portfolio makes a significant contribution to further strengthening the role of hydropower in energy system transformation. An example of this is a large order which we won in Australia in 2019, to supply innovative components for the pumped storage power plant Snowy 2.0. This storage power plant is among the ten largest energy storage systems of its type worldwide and is systemically important for the future of renewable energies in Australia. With an order volume in the mid-triple digit million range, this once more underlines Voith's market leadership

in the large hydro sector. At the same time, it marks a further milestone on Australia's road to complete coverage of its power requirements by electricity from renewable energy sources.

Energy Efficiency

While energy consumption is an important cost factor in hydropower generation, it is of fairly minor significance when these plants are in operation. However, the generation efficiency of our plants is the dominant criterion in our customers' evaluation process. As a result, the continuous optimization of energy efficiency is essential to ensure our products remain competitive. To this end, Voith operates test stands in the Brunnenmühle in Heidenheim; these are among the best of their type worldwide. At the same time, Voith Hydro's development teams have access to state-of-the-art supercomputers, enabling them to carry out advance development at the highest level.

Greenhouse Gas Emissions

As essential components of hydropower plants, our products help to cut greenhouse gas emissions. An analysis currently underway aims to show how large our contribution is here. Important insights were also delivered by a Life Cycle Analysis of scalable StreamDiver hydropower applications, carried out in 2018 as part of a Master's thesis. This focused on the CO₂ footprint of the hydropower applications, with all phases included in the product lifecycle. One of the findings shows that with values between 2 and 10 g CO₂e/kWh the greenhouse gas emissions of StreamDiver applications are very low.

Resource Efficiency

Material efficiency is a direct component of the development objectives in the Group Division Voith Hydro. By means of the latest calculation methods, we ensure that safety and function are always safeguarded when optimization measures are carried out. To further limit our environmental impacts we aim to switch over our production to using environmentally friendly materials wherever this looks technically feasible.

As a basic principle, right from the plant configuration and design phase, care is taken to ensure that recyclable or biodegradable materials are used.

In order to raise resource efficiency in construction even further, our Group Division Voith Hydro will in future employ an increasing number of modular mechanical engineering models as well as the targeted use of components constructed for and proven in earlier projects. The costs of product design, procurement and production are reduced through the “repeat effect”. Reducing mechanical engineering complexity leads to a better focused use of materials and thus to greater material efficiency.

Through this new mechanical engineering approach, business processes relating to product responsibility also need to be adapted. The objective of the new processes is to react significantly earlier to project-related machine rebuilds by means of a modified product approval process, and to preclude product risks through early FMEA analyses. Consequently, we ensure that our products are standardized and modularized by using as many identical components as possible and by ensuring the best possible qualification of our supply chain partners, thus guaranteeing optimal product quality.

Long Service Life, Repairability and Recyclability – Maximum Availability Is the Goal

A key quality of machines and systems in the Group Division Voith Hydro is their long service life – and this is also an integral part of plant specification. Hydropower plants are designed for a specific number of operating cycles, which generally guarantee a service life of at least forty years.

The goal of achieving the highest possible hydropower plant availability is taken into consideration right from the design stage. We are currently working on improvements to enable our customers to get the maximum use from their plants. In addition, we are using the possibilities of digitalization to further improve both security and availability, as well as to reduce the time and scope of necessary maintenance work. Models for predictive maintenance as well as the repair, overhaul, upgrading, and retrofitting of products throughout their lifecycle help to conserve resources while increasing

efficiency. We also carry out residual life calculations: These allow the degree of wear and the residual service life to be determined by analyzing the mode of operation and performing specific system measurements. This allows customers to perform their own maintenance and repair work on the basis of the degree of wear rather than at fixed intervals and so to make better use of materials. We use the services of the HydroSchool to help our customers better understand hydropower plants and their technology, thereby contributing effectively to increasing efficiency and also supporting the availability of the machines.

Not least due to their very long service lives, the recycling of the materials in a hydropower plant is literally a cross-generational topic. The majority of the materials used in a hydro plant can be very easily recycled at the end of its service life, since these are predominantly steel- and copper-based. Thanks to the plant’s long service life, the energy consumption required for recycling is only of very minor significance in the total energy footprint.

Examples of the service life of hydropower plants being extended significantly through modernization are the operations at the Ffestiniog Power Station in North Wales and the Nangbeto Hydropower Plant in Togo:

- Back in the 2016/17 fiscal year Voith Hydro began development, planning, and construction work to modernize the pumped storage power plant in Ffestiniog. Once completed at the start of 2020, the complex will be able to respond more quickly to power grid demand fluctuations and operate across a greater demand range. In addition, as the initial machine units are being refurbished mid-life this will extend their operational lifespan for at least a further 20 years.
- In the reporting year, Voith Hydro was awarded the contract to modernize the power plant in Nangbeto, which has been in operation for 35 years. The aim of this modernization project is to secure the operation of the plant for the next 30 years. The scope of the work includes overhauling the generators, carrying out cavitation tests on the turbines, replacing the turbine blades, and refurbishing the cooling system. Furthermore the automation and communications infrastructure will be overhauled, and a water purification plant will supply local communities with fresh water.

Product Safety

We want to provide our customers with plants which remain safe across their entire service life. This aspiration has the highest priority for us, and applies to all products and services in the Group Division Voith Hydro.

Robust processes, detailed design reviews and the latest calculation methods in state-of-the-art science and technology help us to satisfy this aspiration consistently and at every one of our plants. For risk analysis, we apply FMEA methodology.

Extensive training delivered by skilled specialists with many years of experience at our HydroSchool, as well as comprehensive on-the-job training, ensure that our customers' employees can act safely in the daily operation of the machinery.

Strategies for Greater Sustainability

Around the world, hydropower competes with other renewable energies. Here, alongside specific cost drivers, implementation periods and technology-related subsidies increasingly play a role. We also continually monitor global developments relating to climate change, such as rising levels of reservoir sedimentation, as well as to urbanization and electrification.

In addition there is increasing competition in storage technologies, both for short-term requirements (Li-ion) and long-term storage needs (flow batteries, power-to-x). Nonetheless, pumped storage technology is the only long-term, technically proven and economically viable form of large-scale energy storage. It is gaining in importance in parallel to the expansion of renewables thanks to its contribution to grid stability and supply security.

Also gaining in importance are decarbonization efforts, where the aspects of sector coupling and power-to-x, i.e. the conversion of electricity into forms of energy that

offer better storage characteristics, are attracting special attention. Voith Hydro sees a potential growth market here, which can also lead to a much more sustainable, decarbonized energy system thanks to renewables, especially hydropower.

Shaping the Future with Hydropower

Voith is convinced of the benefits of hydropower, and intends to further strengthen its role in energy system transformation. To this end, Voith evaluates trends and technological developments, incorporating the findings as appropriate into the further development of its product portfolio. In the process, Voith Hydro always needs to keep an eye on special regional aspects and requirements regarding quality, safety, and product responsibility. For instance, in China there is a clear trend towards a dynamic expansion in pumped storage power plants and thus towards highly efficient machinery optimized for both pumping and turbine operation.

In this light, as part of the Foresight project, consistent future scenarios for energy and water were formulated with the help of scenario techniques and retropolation (gap analysis). Alongside the large hydro sector, the focus is also on the growth areas of small hydro, services, and digitalization. In the 2018/19 fiscal year the findings were discussed with our customers and business partners, and compared with their own assessments.

Above all, the three global megatrends of decarbonization, digitalization, and the circular economy shaped the analysis in the Group Division Voith Hydro's Foresight project. While digitalization played a pronounced role in all scenarios, decarbonization and the circular economy were observed differently in the individual scenarios. Together with the structure of world trade (open vs. protectionist) and global economic growth, decarbonization and the circular economy are the key differentiating factors of the scenarios. They also thereby directly influence the key technologies relevant in these scenarios.

Some of the trends which emerged were as follows:

1. With their high number of full load hours and low generation costs, hydropower plants are perfectly suited to the production of synthetic fuels and chemicals essential for decarbonization. Adapted hydropower plants optimized for the production of synthetic fuels offer an opportunity here, with a particular focus on the concepts of power-to-gas and power-to-liquid. No risks through decarbonization have currently been identified, since the demand for both renewable energy and energy storage systems will increase. Also, existing reservoirs are needed to assure the supply of drinking water and flood control.
2. Voith supplies highly efficient pumped storage plants which can store large quantities of renewable energy with a high level of efficiency. The use of water as the storage medium, as well as the almost complete recyclability of the materials used, makes pumped storage the ideal storage system for renewable energy. Today, 97 % of the storage systems for electrical energy are based on pumped storage. Pumped storage power plants that work with a completely closed water cycle and are therefore not reliant on large rivers are currently being planned.
3. The Foresight project identified and evaluated reservoir sedimentation as a major issue for the future: This led to plans for the expansion of our service portfolio. Voith Service is developing partnerships and solutions to counter this issue.

4. However, for Voith Hydro, increased digitalization poses an additional challenge regarding plant security. This is because large-scale hydropower plants count as systemically important infrastructure in many countries, so they need to meet more stringent requirements – particularly in the area of cybersecurity.

Towards the Intelligent Hydropower Plan

Our innovation activities are currently centered on the development of new products and services in the environment of digitalization. Against a backdrop of advancing digitalization, Voith Hydro sees the development of sensor technology as a prerequisite for enhanced interconnectivity on the journey to making the interconnected digital power plant a reality. This will provide customers with specific advantages such as even safer operation within a broader operating range, as well as condition-independent maintenance resulting in higher power generation availability.

In 2018 Voith Hydro founded the OnPerformance.Lab to leverage optimization potentials for our customers. Here, Hydro specialists analyze operating data from hydropower plants, providing specific action recommendations for the optimization of productivity, unplanned shutdowns and plant security. 55 hydropower plants already use analysis services such as remote support and Asset Health Assessments from the OnPerformance.Lab. In the course of co-development projects, plant-appropriate individual optimization approaches are defined first. Using our interactive data platform,

we work in collaboration with our customers to generate first-use cases from the analysis of operating data. The high level of interconnectivity offered by the individual systems permits automated analysis – a unique design feature. The combination of new IIoT solutions such as our acoustic monitoring system with data analytics transforms the system into an intelligent hydropower plant.

Demonstrable sales success confirms this approach. For example, the Austrian power supplier VERBUND uses Voith's acoustic monitoring system OnCare.Acoustic. Thanks to an “ear in the hydropower plant”, the company can reduce service calls and damage at its plants and thus cut costs. The system constantly monitors the condition of the plant, meaning hydropower operators can better plan potential maintenance work. Maintenance calls will ideally then only be carried out when they are actually required. The system uses artificial intelligence and is a sensible complement to the current human monitoring of hydropower plants.

Voith Paper

The Group Division Voith Paper regards itself as a pioneer in the paper industry, with innovative products that optimize the paper production process and enable the efficient use of resources in paper production. As a full-line supplier, Voith Paper delivers an integrated product portfolio from a single source. Its products and components reflect its experience as a process provider, helping to increase the capabilities and efficiency of the entire paper production process while also boosting our customers' productivity and profitability through reduced resource consumption. Thanks to Papermaking 4.0, paper manufacturers can optimally interconnect their equipment and raise their competitiveness through the effective and secure use of the data generated.

Product Group	Share of Revenue of Group Division (%)
Projects	
• New facilities – paper machine	
• New facilities – stock preparation	
• Modifications to facilities	39 %
Roll shells and clothing	
• Paper machine clothing	
• Roll shells	
• Press sleeves	34 %
Products and services	
• Spare parts	
• Performance-enhancing components	
• Services: maintenance and repairs, training and audits	
• Smaller modifications to facilities	27 %

As the average operating lifetime of a paper machine is around 40 years, even minor improvements in equipment efficiency can have a major impact: While the actual process of manufacturing a machine has a negligible environmental impact, the amount of energy required to operate a paper facility exceeds that required to manufacture the machine by a factor of 300.

Besides energy use, water withdrawal is a key factor in the papermaking process – for the environment as well as for the efficiency of the facility. Products such as HydroSeal sealing strips also help to achieve ever more efficient solutions.

Due to the HydroSeal components currently in use, in terms of numbers, over 27.5 million m³ of water are being saved annually compared to conventional technology. This is equivalent to the annual German consumption level of 620,000 people – roughly equivalent to the population of Düsseldorf. On top of this, significant energy savings are being achieved.

We intend to continue further reducing the environmental impacts of paper production while increasing plant cost effectiveness and are always looking for opportunities to increase the recycling rate of its own production processes.

Trend Analyses Deliver Future Scenarios

Since 2016 Voith Paper has used a comprehensive methodology to identify trends. This is based on five pillars: Trend Analysis, Technology Outlook, Customer Perspective, Consumer Perspective, and “Radical Technologies”, i.e. technological changes that are radically altering the paper production process and can affect the entire value chain. The trends already identified such as digitalization, sustainable consumer behavior, population growth, and increasing urbanization remain intact and are decisive for consumer behavior and the development of markets. The megatrends decarbonization, digitalization and the circular economy are key components of the derived future scenarios, and were transposed into strategic objectives for Voith Paper for 2025 and also through to 2040.

Sustainability Criteria Considered in Development

The product development process in the Group Division Voith Paper follows the stage-gate process. In the development phase, every product undergoes an assessment

that examines the following key sustainability parameters: water, energy, fibrous raw material, quality and efficiency. This assures high standards for sustainability and security. Also, ensuring our facilities can be repaired is a key requirement in the development stage. Furthermore, test installations offer the chance to analyze reference values and thus lay the foundation for customer-specific modifications and improvements.

Current research and development focus areas for Voith Paper relate to increasing efficiency in paper production; improving sustainability through reducing water withdrawal and energy consumption; reducing emissions; and improving raw material yield. This activity leads to product innovations that help our customers lower fiber and energy consumption in paper and cardboard production. We are also working on avoiding production disruption at paper manufacturing facilities resulting from adhesive contamination of the reused waste paper. A further focus is developing the ability to manufacture high-value, robust packaging from recycled fibers with minimal fresh fiber input.

Strategy for a Sustainable Product Portfolio

Voith Paper aligns its product strategies with growth markets and meets their different requirements on paper types and regional aspects to the greatest extent possible. One area is hygienic tissue, where demand is linked directly to the development of the world population and to economic growth in emerging countries. The digitalization of highly complex paper production processes will determine competitiveness in the future. Decisive factors will be first and foremost the efficiency of the machines used, followed by optimization of paper production processes.

Voith Paper aims to generate the greatest added value for its customers through maximum resource-friendliness in operation and efficiency in design. To Voith Paper, resource conservation means above all reducing the specific consumption of fresh-water as well as electrical and thermal energy per tonne of paper produced. It also means reducing fiber loss and wastewater. Moreover, Voith Paper is always looking for opportunities to increase the recycling rate of its own production processes. These objectives apply to all new products developed by the Group Division Voith Paper. To further optimize the operational reliability of our customers' own paper facilities we are also working on the automation of manual process interventions in hazardous areas.

 **Fact base** Further Information on Social and Environmental Impacts – Voith Paper

Energy Consumption and Greenhouse Gas Emissions – Megatrend Decarbonization

Worldwide, the paper industry is facing the challenge of significantly reducing CO₂ emissions. This applies especially to Europe where, in its Roadmap 2050, the Confederation of European Paper Industries (CEPI) aims to achieve a reduction in CO₂ emissions of 80% in comparison with levels in 1990 – an enormous challenge for the entire paper value chain. Voith Paper wants to contribute to mastering this challenge and adjusted its strategy in the reporting period: In future, the aim is only to develop products and services that have a positive effect on customers' energy efficiency and production costs.

In four defined focus areas, technologies and processes will be developed or optimized with the aim of cutting paper production CO₂ emissions and conserving resources.

1. The continual further development of products and technologies aimed at decreasing energy consumption is already delivering important contributions to the reduction in CO₂ emissions.
2. Digitalization solutions to improve paper facility efficiency and availability, which are already finding their way into production systems today, will in future make an even greater contribution to the reduction in CO₂ emissions and the conservation of resources.
3. A further important focus area providing great strategic leverage will be the use of energy from renewable sources. Energy storage technologies and smarter process control through artificial intelligence creates an opportunity to produce cost-effectively, even in difficult operating conditions. Furthermore, although development is still in a very early phase, CO₂ storage technologies (carbon capture & storage) will be able to make an important contribution to reducing CO₂ emissions in the future.
4. Last but not least, the very mature industrial process of paper production offers the potential for significant reductions in energy consumption and therefore also the in quantity of CO₂ emitted. To do so, fundamental, and where appropriate also disruptive new developments will be required.

Voith Paper is active as a partner in the Model Paper Factory. Since early 2019, partners from different scientific disciplines have been working together on the future of paper production. The goal is to design, build and run a CO₂-neutral model factory.

Voith Paper's products are already highly energy-efficient. Nevertheless, for around three-quarters of the Division's products, work is currently progressing on further energy efficiency improvements and thus on their carbon footprint. For example, the Green Pulping project aims to develop an energy-efficient pulping system for waste paper. In the area of clothing, products are continuously developed that reduce energy consumption in paper production. Moreover, products from the areas of rolls and fabrics will contribute to general energy savings in continuous operation. They will also reduce energy requirements in paper machine ramp-up to peak output, thus saving energy and cutting costs. Examples are a new forming fabric launched in 2019, and a felt, also available since 2019, that requires less drying energy, particularly in the critical operations start-up phase.

Products in the Mechanical Roll Service (MRS) area are also targeting reductions in paper machines' energy and fresh water requirements. In order to satisfy this aspiration, we are conducting Life Cycle Analyses on our products – from the manufacture of raw materials and transportation, through the production process, to use and end-of-life recycling.

During operation, digital service tools such as OnCall.Video and virtual reality training contribute to reducing travel and therefore also the carbon footprint. For the same reason, Voith Paper service locations are always situated close to customers. Since 2015, our regional presence has steadily expanded around the world – from 14 service hubs in 2015 to 20 regional locations at the end of the reporting period. For example, a new service location was opened in Chile, in order to significantly reduce the carbon footprint in this part of South America through reduced transport of heavy rolls. By 2025, a further ten service locations are planned.

Life Cycle of a Paper Machine and the Contribution of Voith Paper Components



1. Planning Phase/Supply chain

- Reduction of supply chain risks due to high content supply chain requirements (see AEB and CoC)
- Ensuring regular monitoring

2. Creation

- Production sites ISO 14001 and OSHAS 18001 matrix-certified
- Planning services for the entire paper plant
- Ensuring the occupational health and safety of our employees when at the customer's location

3. Utilization Phase (Paper Production) – VP Products / Services Can Improve:

- Energy, water and fiber consumption
- Use of chemicals
- Emissions
- Extension of the usage phase by:
 - Modular design
 - Service offering

4. End-of-Life

- Potential opportunities: Recyclable materials such as metals, Civil engineering materials, plastics, oils
- Potential risks: process residues, hydraulic oils

Long Service Life of Products through Upgrading, Retrofitting and Ensuring our Products can be Repaired

If facilities are to operate efficiently and safely for decades, aspects such as ensuring our products can be repaired and facilities upgraded play a significant role in economic feasibility.

Together with our customers, care is taken early on during plant installation to ensure optimal operating conditions. In addition, special service audits offer customers the opportunity to assess individual machine components or even entire systems, and so to further optimize operating conditions. This also includes aspects such as energy and raw materials consumption. Regular maintenance and the appropriate documentation deliver an overview of plant condition, also contributing to the optimal operation of the facility. Innovative products such as TalkingRoll and SealView, launched on the market in 2019, harness the advantages of digitalization and sensor technology, supporting future repairability through preventive maintenance.

A further example is the automated and secure identification of our products by means of ID tags. These digital solutions not only save costs, but also reliably avoid installation of the wrong components, which can potentially lead to hazards to people and machines.

For existing facilities, upgrades offer the chance to reduce energy consumption in all process steps. Nevertheless, Voith engineers are constantly tasked with supplying spare parts for third-party components – e.g. for transmission units produced by competitors that are no longer active in the market – to enable customers to continue operating a system.

Using Resources Efficiently – the Goal of a Circular Economy

Voith Paper is increasingly using renewable raw materials and is working tirelessly to close material, water, and auxiliary cycles. By virtue of the decades-long service life of paper machines, our development experts' focus is above all on resource efficiency in the utilization phase. Voith paper machines enable the production of paper products in which resources are used optimally.

Steel, as well as materials for structural and civil engineering, account for the largest share of material types in Voith Paper's supply chain. For stainless steel and black (untreated) steel, further increases in material efficiency are achieved by means of modern calculation methods and production processes. In the area of rolls and fabrics, plastics have the largest share in terms of value. Here, alternatives to petroleum-based plastics are currently being sought and developed, while different options for material recycling are also being analyzed and evaluated.

The paper value chain currently enjoys a very stable position with a high recycling rate, which in Germany today stands at over 75%. In order to increase this share further and to continue to close the cycle, appropriate technologies for stock preparation are required. It is thereby important to develop additional process steps or customized processes in order to safeguard the use of recycled paper in paper production. A particular challenge regarding recyclability is the loss of large amounts of graphic paper such as newspapers and magazines. This means that fewer fibers often only used once are introduced into the recycling loop. In turn, this reduces the strength potential of the used-paper mix. Voith Paper is working on new solutions, such as OnEfficiency.Strength, to improve the strength potential of fibers before further processing – a key contribution to maintaining the recycling loop.

The area of plastic packaging offers the chance to replace plastic packaging with paper and cardboard products, which are highly attractive due to their very good recycling properties. This requires the further development of paper and cardboard boxes so that they can assume the barrier function of plastics, repelling water, fat and gaseous substances while at the same time retaining their recyclability.

Voith Paper has had many decades of market success with recycling technology for waste paper as a raw material for paper production, waste water, and rejects. Today, the Group Division leads the market in stock preparation solutions and is working further on the development of processing technologies as well as concepts for improving fiber yield and quality. These developments are implemented in close collaboration with customers, ensuring a rapid market introduction. The target is to develop the necessary machine-based solutions in order to be able to produce these papers and cardboard boxes at competitive costs. With a broad product portfolio of components for process improvement (PEC), Voith Paper offers solutions that are optimally tailored to meet the evolving challenges of paper reuse.

P&S products are developed so as to achieve both low fiber loss and a reduction in reprocessing chemicals. Both for new facilities as well as for existing plants, we provide solutions that guarantee optimal processing of recycled fibrous material, even when this is of low quality. An example: in the reporting period, with QualiFlex shoe press sleeves, a change made to the chemical composition of the sleeves allowed them to react better to mechanical malfunctions, which cannot be completely avoided in paper machine operation – particularly given the steadily worsening quality of fibrous raw materials from recycled sources. This enables the shoe press sleeves to achieve an extended lifespan.

In the reporting period, concepts were developed to integrate wearing parts even better into the circular economy. Since the high-performance plastics needed for the products and the surplus or residues produced during the manufacturing process

can rarely be reused one-to-one, disposal or downcycling generally take place. We are currently working on evaluating renewable raw materials as a replacement for petroleum-based raw materials.

Digitalization – An opportunity to Differentiate Ourselves from the Competition

Digitalization offers Voith Paper the opportunity to use its core strengths to differentiate itself even more clearly from the competition. Together with Voith Digital Ventures, Voith Paper is working on increasing the availability of paper machines as well as improving process efficiency. This also includes predictive maintenance solutions. One example is the Talking Roll, a sensorized functional roll that learns by itself, predicting remaining roll runtime and actively communicating service requirements; the safe operating window regarding predictive maintenance is calculated using cloud-based data analysis techniques. In addition, the system indirectly serves to complete the higher-level datasets required for the efficient management of paper production processes. A further driving force of the digital portfolio in the Paper Division are the OnEfficiency products that can help customers save fibers, chemicals, water and other raw materials when operating their facilities. This means that the OnEfficiency suite not only represents a valuable contribution to greater machine operating efficiency for our customers, but also protects our environment thanks to more sustainable use of natural resources.

In the project business, through incorporating digital thinking early, Voith Paper wants to set benchmarks in constructing plant required for the scaling and sustainable implementation of digitalization. The focus here is on the development of smart products and cloud-based data analysis techniques. Under the label PM (Papermaking) 4.0 Ready, the aim is to prepare both instrumentalization and automation for the digital age.

For example, we are working on further stabilizing paper production processes through data analysis. As a result, rejects will be avoided and resources such as fabric, water and energy will be used more efficiently.

The Voith Blue Box, a tool for recording machine-specific data, laid the foundation for an automation platform in the reporting period. The collected data can be analyzed via the OnCumulus cloud and used for 24-hour online monitoring.

Digitalization also plays an important role in the service business. Tools such as the Video Remote Service and virtual reality training enhance the existing service portfolio. This allows travel time to be reduced and at the same time lowers costs and CO₂ emissions. In the replacement parts business, thanks to additive manufacturing, i.e. the 3D printing of parts on site, the transport of “emergency spare parts” can be avoided. Furthermore, 3D printing also enables the use of environmentally friendly materials.

Outlook

Over the coming years Voith Paper expects new emissions legislation, which took effect from mid-2018 in the EU and in all signatory countries to the Kyoto Protocol, to provide considerable stimuli. As a consequence, customers are giving greater consideration to energy-saving projects – a focus that our machines, products, and modification projects strongly support. Within this, Voith Paper is concentrating in particular on the topic of wastewater treatment and the further closure of water cycles.

Voith Turbo

The Group Division Voith Turbo is a specialist in intelligent drive solutions, systems, and pioneering service solutions. Customers from numerous sectors such as oil & gas, energy, mining and mechanical engineering, marine technology as well as rail and commercial vehicles rely on Voith’s cutting-edge technologies and comprehensive expertise.

Product Group	Share of Revenue of Group Division (%)
VT Mobility	67 %
VT Industry	30 %
VT Others / Digital Ventures	3 %

Trend Analyses Define Search Fields for Innovations

After the successful conclusion of the Foresight project, in the reporting year Voith Turbo further developed its scenarios for mobility, water, and environmental technologies. Strategic search areas for innovations and technologies were derived from the findings of the project, also in the fields of alternative drives, artificial intelligence and the use of new and hybrid materials. Specific technology roadmaps for the electrification of powertrains were also developed, as well as roadmaps for the further digitalization of product lines.

Life Cycle of a Transmission and the Contribution of Voith Turbo Components



1. Planning Phase/Supply chain

- Reduction of supply chain risks due to high content requirements supply chain (see AEB and CoC)
- Ensuring regular monitoring

2. Creation

- Production sites ISO 14001 and OSHAS 18001 matrix-certified
- Ensuring the occupational health and safety of our employees when integrating the transmission unit at the customer's location

3. Utilization Phase (Urban and Intercity Traffic) – VT Products/Services Can Improve:

- Reduction of emissions through acceleration and topography-based gear shifting and Smart Assist
- Optimization of operating costs through Smart Maintenance and service-friendliness
- Resource conservation through exchange gear program (refurbishment of gearboxes)

4. End-of-Life

- Professional handling and disposal
- Recyclable materials such as aluminum, copper, steel, little plastic

Strategy for a Sustainable Product Portfolio

Voith Turbo aims to offer its customers increasingly energy-efficient and eco-friendly product generations, and makes ongoing efforts within a continual improvement process in which customers are also involved to ensure this. Here we always focus on the impact of using a Voith component on the total cost of ownership (TCO). Energy costs account for by far the largest share, so reducing these takes top priority for all business areas at Voith Turbo. At present, further improvements in energy efficiency and the climate footprint are being made for 80 % of the products in the Group Division Turbo.

One example from the reporting period is the new Voith Electrical Drive System, which marks a milestone in the transformation of inner-city mobility. As a long-standing and established system supplier and partner to the bus industry, Voith Turbo has combined its expertise in drive units, e-mobility and telematics applications to develop a pioneering electric drive system for public transport that generates no local NOX or CO₂ emissions, is easy to integrate, and operates quietly and efficiently.

 **Fact base** Further Information on Social and Environmental Impacts – Voith Turbo

Voith Turbo predominantly supplies components that, as part of an overall system, have differing energy and material footprints. We employ a range of tools to gain an even more detailed picture of our products' energy and raw-material efficiency. Among these, for many years now we have conducted product Life Cycle Assessments (LCAs) in accordance with ISO 14040 and 14044.

Voith Turbo also aims to reduce its use of materials with a negative impact on human health or the environment to an absolute minimum. The product development process already incorporates this requirement right from its early stages, with harmful materials replaced by other materials as early as the engineering phase, wherever technically and economically feasible.

Guideline for Sustainable Product Development

Voith Turbo has established a guideline for implementing sustainable product development. The three steps, Green Design, EcoDesign and Sustainable Design, describe all material sustainability criteria and define specific requirements. For example, Green Design encompasses aspects of material selection, ingredients, packaging, reparability, and end-of-life considerations. EcoDesign explains the principles of Life Cycle Assessment according to ISO 14040 and 14044. Sustainable Design adds social and legal aspects such as fair competition and ethical conduct in business relationships.

Focus on Energy Efficiency – Megatrend Decarbonization

For Voith Turbo, decarbonization and the path towards e-mobility are still the key megatrends, which once again accelerated during the reporting period in combination with significantly more demanding emissions targets. Voith Turbo Mobility is addressing this challenge by developing hybrid transmissions and a fully electric drive. The aim here is the market launch of singularly efficient systems in the competitive environment.

In addition, extensive e-mobility projects have already been set in motion together with Voith Digital Ventures. In the reporting year, this collaboration led to the delivery of six city buses supplied with electric drive systems and will be put into operation in future in Schwäbisch Hall and Heidenheim, Germany.

With the delivery of the first automated train couplers for freight trains to Swiss Federal Railways (SBB), Voith is contributing to strengthening rail freight transport, which can substantially help with lowering CO₂ emissions. The global trend towards urbanization also gives Voith Turbo an opportunity in the area of construction machinery, for example by offering heavy transmissions and electric drive technology. In the industrial sector, Voith Turbo is preparing for the expansion of the hydrogen economy. This Group Division can make an important contribution here to the efficient liquefaction and compression of hydrogen.

Long Service Life and Reparability – Contributing to the Circular Economy Megatrend

Long service life is a key quality of Voith products and at the same time means they use fewer resources. Our service promise is based on supporting systems and components over a very long period with spare parts and therefore avoiding early scrapping. This remanufacturing is resource-efficient by prolonging products' lifecycle, while customers benefit from lower total cost of ownership (TCO) due to the longer life span.

We are now also able to restore spare parts with low resource consumption thanks to newly developed additive manufacturing processes, which avoid new cast parts, for example. Digitalization in service and production also supports the overhaul of bus-transmission returns and leads to design improvements, intelligent spare parts supply, and significantly optimized transmission service life.

As part of modularization and value analysis, we are working on further increasing the recyclability, upgradeability, and reparability of products. This is enabled, for example, by intelligently designing interfaces so that individual modules can be swapped out quickly and easily without having to replace the entire product.

Megatrend Digitalization

Voith Turbo continues to focus on the digitalization of its product portfolio to enable resources to be used even more efficiently. To this end, in the reporting period Voith Turbo worked on various systems for status monitoring components and systems. This is intended to avoid critical operating conditions and support the reliability and long service life of products. At the same time, these systems deliver valuable information about how the machines can be operated with greater energy efficiency.

The digitalization of internal process chains allows Voith Turbo to provide customers with offerings and assistance more quickly, for example by using appropriate configurations to maximize product utilization efficiency. Examples of this are the use of augmented reality in manufacturing, and the provision of interactive maintenance instructions in service.

Customers Play a Key Role

As part of product development, Voith Turbo customers are involved early on in providing their feedback – in some cases even on a prototype or MVP (Minimum Viable Product) basis. Examples of this approach include the BeltGenius product for the mining sector, as well as various development projects in the area of mobility. Dedicated customer surveys were also conducted in the reporting period ahead of the development of the rail products New DHM and DIWARail NXT.

Customer requirements focus on compliance with the relevant regulations relating to hazardous substances (REACH), increasing the efficiency of drive components, their service life and maintenance, and the long-term availability of spare parts, especially for electronic components.

Our customers are increasingly requesting condition-monitoring systems, and work is already underway together with those requiring them on realizing these. CM systems monitor critical processes in the oil and gas sector. In addition, together with our Mobility customers we have developed the market-ready Smart Accelerate product: This allows fuel savings to be achieved in city bus operations and is already proving its worth in trials.

We maintain an extensive list of customer requirements, which provides important starting points for the further development of the product portfolio. This results in clear

quantitative specifications in project requirements and scopes in terms of efficiencies, fuel consumption or total operating costs.

Safety

Voith Turbo places the highest demands on the quality of its products and has documented this in its safety policy. The Group Division sets corresponding targets and closely monitors their achievement. Product safety is an integral part of all processes, while preventive methods such as Failure Mode and Effects Analysis (FMEA) are also anchored there. Quality Management reviews the achievement of safety targets annually, assesses safety-relevant incidents, and takes appropriate measures where needed.

Voith Turbo inspects all products regarding safety and potential impact on health. We consider a large number of relevant criteria here, from functional safety, through explosion and fire protection, to electrical safety and electromagnetic compatibility. All products are also monitored for safety and reliability throughout their service life. Depending on the applicable contractual, legal, or official requirements, systems such as Entity in Charge of Maintenance (ECCM) are applied, as well as information from officially required systems. Our own observations and insights as part of maintenance contracts provide further indications.

Voith Turbo provides its customers with all relevant safety information. This can be found for example in Safety Data Sheets, product declarations (REACH, IMDS, etc.), fire protection certificates for materials or safety requirement specifications for risk assessments (CE, etc.). Wherever necessary, Voith Turbo supports its customers when it comes to authorization and approval of its products, and delivers the required documentation and registration papers. The Division's experts are often involved in the creation of safety concepts as early as the product development phase and

check their implementation, right through to joint validation with the customer. Where required, the components are taken into operation jointly with the product or system customer. Extensive training courses on the safe operation of products provide further support in this area.

Outlook

Voith Turbo continues to see a considerable increase in demand for energy-saving solutions in the power plant and raw materials segment. There are also an increasing number of approaches to rolling out systems and services that monitor and increase the efficiency of entire plants – an area in which Voith Turbo works closely with Voith Digital Ventures. In China, expansion of the high-speed rail network shows no signs of slowing down. In Europe in particular, Voith Turbo expects a further tightening of rail and commercial vehicle emission regulations as well as growing customer demands for greater vehicle energy efficiency. In the medium and long term, it is expected that less efficient technologies will be gradually taken out of service in all markets and areas relevant to Voith Turbo. It is important here to establish transition technologies that are both technically and economically viable. Long-term, these will be sustainable technologies in which combustion engines no longer play a role.

Voith Digital Ventures

Voith offers its customers digital solutions with demonstrable added value. Customers benefit from performance improvements and lower operating costs, also in maintenance thanks to the optimization of availability and costs.

Digital Ventures partners the Group Divisions in developing digital solutions. To this end, Digital Ventures provides a cross-divisional, scalable, future-proof and end-to-end technology stack, among other supports. This data ecosystem enables the fast and efficient development of new digital products and solutions, short time-to-market, and a high level of scalability of the solutions developed.

In addition, Voith Digital Ventures holds responsibility for topics across Group Divisions in the areas of asset management, health performance management and condition monitoring. With the convergence of automation and IIoT, Digital Ventures ensures the interaction and joint development of these areas, especially through the Automation Platform and OnCumulus projects.

Focus on Opportunities through Digitalization

In its Foresight project, Voith Digital Ventures highlighted the opportunities presented by the use of digital technologies in the relevant markets. These primarily concerned solutions that provide demonstrable added value for our customers, such as cost savings, quality and production increases, process stabilization, and improved maintenance management. Digital Ventures also highlights the identified trends in its search for new partnerships and corporate investments.

Based on cloud technologies, in the reporting period various foundational applications were developed on the shared OnCumulus platform that are intended to become part of the of Voith Paper, Hydro, and Turbo product offerings. A particular focus here was on the application of machine learning (AI) to help continuously optimize the operation of systems and increase their availability. Work is currently underway to further develop the architecture for combined automation and operation monitoring systems as integrated IIoT systems that can be used in all Voith core areas.

The progressive collection of a wide range of data from different sources – such as environmental or geodata as well as data on consumer behavior – opens up new evaluation possibilities when combined with production data. The extension of data acquisition via IOT systems and its combination with machine data supports new applications, such as assistance systems to support energy-saving driving styles for vehicles.

4.2 Responsibility in the Supply Chain

In the 2018/19 fiscal year we once again purchased goods and services worth over €2 billion from our external suppliers and service providers. The spectrum of the goods we purchased was, as always, highly diverse. Measured by overall invoicing volume, the purchase of complete plant systems represented the largest item of expenditure, as in the previous year. As a fundamental principle we work to build long-term relationships with our business partners, and therefore closely monitor the economic sustainability of our requirements on them. In this regard, fairness is the core element in establishing and maintaining a long-term, trust-based business relationship.

 **Fact base** Procurement Markets

Managing Sustainability in the Supply Chain

Our Corporate Strategic Purchasing (CSP) Department is responsible for sustainability topics within Voith's purchasing activities. Besides reporting, the department also focuses on supplier-specific compliance activities. Current topics are agreed in the Purchasing committee on a cross-Group divisional level, together with representatives from each division. Our fundamental principles on resource conservation, environmental and social responsibility are anchored in our Purchasing strategy and the process descriptions in the Voith Purchasing Manual, right across all our supply chains. In our purchasing activities we pay particular attention to compliance with applicable laws, including those relating to occupational health, safety and environmental protection, and the prohibition of child and forced labor. Different legal situations and constantly growing demands on documentation place high demands on our company.

In a Declaration of Principles, Voith has committed to the 1948 UN Universal Declaration of Human Rights, the 2015 UK Modern Slavery Act, and the 2010 California Transparency in Supply Chains Act. This sets out clear rules for prohibiting forced labor and human trafficking in the supply chain. Voith rejects any and all forms of forced or child labor, as well as any obstruction of the legal representation of employees' interests. If a supplier violates these rules, we are obliged to terminate the relationship.

Various preventive measures ensure that the rules are implemented: In addition to the clear guidelines in the Code of Conduct, all employees receive appropriate e-training, while managers in Sales and Purchasing are specifically sensitized and trained in face-to-face training sessions. For suppliers with an order volume of more than €25,000, we also carry out an integrity check, consisting of an appropriate background research by Purchasing staff. Last but not least, our regular supplier audits also include plant inspections, during which particular attention is paid to indications of forced or child labor.

Code of Conduct Sets the Framework

Our Code of Conduct (CoC) is the core guide for all our purchasing activities. Together with our General Purchasing Conditions (GPCs), the CoC defines our understanding of partnership-based collaboration and sets out guidelines on dealing with issues regarding compliance as well as environmental and social standards. Among other stipulations, it requires full compliance with our ban on discrimination. In addition, the GPCs contain a directive governing the declaration of hazardous materials.

 **Fact base** Approach to Hazardous Substances and Conflict Materials in the Supply Chain

Our CoC and GPCs are freely accessible online. They provide the basis for sustainable agreements with our suppliers, and also require them to place their own subcontractors and upstream providers under equally strict (or stricter) obligations. Furthermore, during the assessments and audits carried out by Quality Management, attention is paid to compliance with social and environmental standards in accordance with our Code of Conduct.

By drawing up country-specific versions of our GPCs we ensure that our Purchasing organization takes national particularities into account, for instance with regard to payment conditions, environmental requirements, and customs regulations. In the reporting period, specific versions were put in place for a further four countries, while one was updated.

 **Fact base** Country-specific GPCs

 **GPC** General Purchasing Conditions

Central IT System Enables Supplier Management

Voith SLM & eSourcing (SLM = Supplier Lifecycle Management) is a central system for supplier management used by Voith Purchasing globally and across several sites. Regular software updates are also used to correct and eliminate redundant and obsolete datasets. Suppliers can log into Voith SLM & eSourcing as users directly via the Voith homepage, update their details themselves, complete survey questionnaires, upload certificates, and respond to calls for tender.

The system also comprises further supplier management aspects, in addition to the Compliance and Sustainability Checks as well as the Supplier Evaluations as detailed below: These aspects include a document database for contracts and contractually related documents such as Non-disclosure Agreements (NDAs), as well as a certificate database that includes quality certifications.

A further function of Voith SLM & eSourcing is eSourcing itself, aimed at raising transparency in purchasing processes. This makes it possible for suppliers to process requests online via a unified platform that additionally interfaces with the Voith SAP system. Price negotiations on individual tenders can also be carried out online. This eliminates the need for travel to face-to-face negotiations and also correspondingly reduces the burden on the environment. The transparent and fair contract award process for all parties, internal award specifications for auctions, and eAuction Golden Rules also ensure that compliance requirements are met at all times.

Extensive Training Programs

The Purchasing School training program was specially developed for our Purchasing organization. We actively encourage our employees to take part in Voith's global further education offer to ensure that our people are always fully up to date on legal compliance requirements, adherence to standard purchasing processes, usage of our IT systems, and our supplier negotiation rules.

Our further education measures include a compulsory one-day, onsite training module on Compliance, and the regular New Buyer Academy for recently hired Purchasing employees. In the onsite courses, local trainers also present key elements of the respective market culture and characteristics. Webinars and e-learning offers additionally ensure training content is globally available and constantly up to date. Seminars and webinars are delivered in all Voith regions around the world.

In the reporting year, almost all Purchasing employees once again took part in training or e-learning courses. Overall, Purchasing employees received 9,397 training hours in the year under review, around 1,850 of these as part of the Purchasing School. Ongoing compliance training also took place regularly. These mandatory events for Purchasing employees focused on the rules of the Code of Conduct, the relevant anticorruption laws, competition law, and occupational safety regulations.

 **Fact base** Scope of Training

All relevant information on the topics of compliance and sustainability, the Voith Code of Conduct, the GPCs, and documents on packaging and logistics guidelines, empty container requirements, etc. are publicly available on the Voith website under Supplier Ecosystem.

Consistent Response to Violations

If a supplier violates applicable laws or the Voith Code of Conduct, or loses its creditworthiness, our Purchasing organization is required to terminate the business relationship and to place the respective supplier on the Group's central blacklist. Violations of Voith's occupational safety, health, and environmental protection standards can also trigger Group-wide blacklisting. This also takes place in cooperation and coordination with the Voith Legal department in order to be able to assess the violation from a legal and compliance perspective. The actual blacklisting is then carried out by Voith's central Master Data Governance department, which has had organizational representation in all Voith regions since 2019 and has begun to assume its technical responsibility there. To this end, a central Master Data Governance System is being introduced to support the processes technically. This project started in the reporting period and is now being implemented in stages.

Suppliers as well as all other external stakeholders can also report violations of sustainability standards in the supply chain on their own initiative. The Voith whistleblower hotlines (Whistleblower Scheme and Compliance Helpdesk) are available to them, just as they are to our own employees. The Compliance Helpdesk is divided into five local Compliance Helpdesks. Staffed by local multilingual contacts and present in all key Voith regions – China, North America, South America, Austria, and Germany (including all other countries) – this system is available to both internal and external whistleblowers. The Compliance Helpdesk and the Whistleblower Scheme are also available via the Voith website. The anonymity of whistleblowers is always assured.

Checks Prior to Business Relationships

As soon as new creditors (suppliers) are created – led by the Master Data Governance department and supported by Purchasing staff – various upstream Compliance and Sustainability Checks enable Voith to screen potential suppliers before a business relationship is established. For instance, they establish whether a specific supplier is based in a risk country (Critical Country Check) or is even blacklisted (Blocked List Check). Supplier-data consistency, including their banking records, is double-checked by at least two Voith specialists.

Self-assessments Help Reduce Risks

To minimize risks in the overall purchasing process we continue to require regular Compliance and Sustainability self-assessment documentation from our suppliers. The Group-wide standardized Supplier Questionnaires ensure that the data from these are collated and processed in a logical and optimally coordinated way. As at the end of the reporting period the system already contained a valid Compliance and Sustainability Check for over 5,971 Voith suppliers. The suppliers assessed in this way represented 64 % of our overall supplier expenditure. Alongside material-specific questionnaires, the Supplier Self-assessment on HSE (occupational safety, health, and environmental protection) complements our Supplier Self-assessment initiatives.

Fact base Supplier Self-assessment

In addition to the Supplier Self-assessment, working together with our buyers our employees in the specialist departments also assess our active suppliers. A standardized procedure with transparent criteria ensures cross-Group comparability of the results. We are now increasingly switching to case- and classification-based assessment: This new approach allows us to focus more closely on the content of our supplier interactions and business relationships.

Fact base Evaluation of Suppliers

In the reporting period, the transparent criteria for production material were reviewed, simplified further, and standardized across the Group and the world. This increases transparency and comparability of the results.

There are currently over 1,200 individual evaluations for almost 1,000 defined suppliers, which can be viewed worldwide in the system. The topic area of sustainability is also included as a criterion in this supplier evaluation. The Sustainability Ratio shows our specialists' subjective assessment of our suppliers regarding compliance with environmental and social standards. The business partners we assessed in the reporting period reached an average ratio of 82.8 %, which broadly matches the ratio achieved in the previous year.

Furthermore, a uniform supplier classification system was implemented in the reporting period. At present, Purchasing staff are classifying suppliers according to their importance in the supply chain.

 **Fact base** Supplier Compliance

GRI-Index 2019

General Disclosures

Disclosures	Comment	Reference
Organizational profile		
102-1	Name of the organization	3
102-2	Activities, brands, products, and services	3–4
102-3	Location of headquarters	3
102-4	Location of operations	3 AR 2019: 84–85
102-5	Ownership and legal form	3
102-6	Markets served	Fact base: International Focus (76)
102-7	Scale of the organization	4–5 Fact base: Economic Indicators (75) Fact base: Employee Structure (92) AR 2019: 76–77
102-8	Information on employees and other workers	29 Fact base: Employee Structure (92) Fact base: Employees by Employment Type (93–94)
102-9	Supply chain	60 Fact base: Procurement Markets (111)
102-10	Significant changes to the organization and its supply chain	4–5
102-11	Precautionary Principle or approach	As a family-owned company with a long-term focus, Voith is committed to a precautionary approach. This is anchored in our management and Group Directives, for example in the Health, Safety & Environmental Protection (HSE) Group Directive.
102-12	External initiatives	9–12
102-13	Membership of associations	Fact base: Memberships and Association (77)
Strategy		
102-14	Statement from senior decision-maker	2
Ethics and integrity		
102-16	Values, principles, standards, and norms of behavior	9–12; 60–61
102-17	Mechanisms for advice and concerns about ethics	10 Fact base: Escalation Paths (77)

Disclosures	Comment	Reference
Governance		
102-18	Governance structure	AR 2019: 8–16
Stakeholder engagement		
102-40	List of stakeholder groups	7–8
102-41	Collective bargaining agreements	30 Fact base: Details on Upholding Employee Rights (95)
102-42	Identifying and selecting stakeholders	6–8
102-43	Approach to stakeholder engagement	6–8
102-44	Key topics and concerns raised	7–8; 42
Reporting practice		
102-45	Entities included in the consolidated financial statements	113 AR 2019: 84–85
102-46	Defining report content and topic Boundaries	8
102-47	List of material topics	8 Voith SR 2018: 8
102-48	Restatements of information	113
102-49	Changes in reporting	113
102-50	Reporting period	113
102-51	Date of most recent report	113
102-52	Reporting cycle	113
102-53	Contact point for questions regarding the report	114
102-54	Claims of reporting in accordance with the GRI Standards	113
102-55	GRI content index	64–73
102-56	External assurance	This report has not been externally audited.

Topic-specific Standards

Disclosures		Comment	Reference
Economic			
Economic Performance			
103/201	Management Approach		4–5
201-1	Direct economic value generated and distributed		Fact base: Economic Indicators (75–76) Fact base: Donations and Sponsorship (78) Fact base: Expenditures for Employees (95)
201-3	Defined benefit plan obligations and other retirement plans		AR 2019: 106–107
201-4	Financial assistance received from government	No significant financial assistance in the reporting period.	
Anti-corruption			
103/205	Management Approach		9–12; 60–63 Fact base: Escalation Paths (77) http://voith.com/corp-de/coc-english.pdf
205-2	Communication and training about anti-corruption policies and procedures		10 Fact base: Compliance Training (77)
Anti-competitive Behavior			
103/206	Management Approach		9–12; 60–63 Fact base: Escalation Paths (77) http://voith.com/corp-de/coc-english.pdf
206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	For reasons of confidentiality, the number and type of complaints is not communicated externally.	10–11; 62–63 Fact base: Breaches of Compliance Regulations (77) Fact base: Supplier Compliance (112)
Environmental			
Materials			
103/301	Management Approach		15–20
301-1	Materials used by weight or volume		24 Fact base: Materials Used (86)
301-2	Recycled input materials used		24 Fact base: Materials Used (86)

Disclosures	Comment	Reference
Energy		
103/302	Management Approach	15–20
302-1	Energy consumption within the organization	21–22 Fact base: Energy Consumption by Scope (80–81) Fact base: Production-related Energy Consumption (82) Fact base: Proportion of Direct and Indirect Energy (82) Fact base: Renewable Energies (82) Fact base: Electricity Mix (82)
302-2	Energy consumption outside of the organization	21–22 Fact base: Energy Consumption: Total (80) Fact base: Indirect Energy Consumption: Scope 3 (81) Fact base: Proportion of Direct and Indirect Energy (82)
302-3	Energy intensity	18 Fact base: Production-related Energy Consumption (82)
302-4	Reduction of energy consumption	21–22 Fact base: Energy-saving Measures and Further Potentials (80)
302-5	Reductions in energy requirements of products and services	44–45; 51–52; 56–57 Fact base: Further Information on Social and Environmental Impacts – Voith Hydro (106–107) Fact base: Further Information on Social and Environmental Impacts – Voith Paper (108) Fact base: Further Information on Social and Environmental Impacts – Voith Turbo (109–110)
Water		
103/303	Management Approach	15–20
303-1	Interactions with water as a shared resource	26–27
303-2	Management of water discharge-related impacts	27–28
303-3	Water withdrawal	18; 26–27 Fact base: Water Consumption (88–89)
303-4	Water discharge	27 Fact base: Wastewater by Method of Discharge (90)
Emissions		
103/305	Management Approach	15–20
305-1	Direct (Scope 1) GHG emissions	23–24 Fact base: GHG Emissions Recording Methodology (83) Fact base: GHG Emissions: Scope 1 (84)

Disclosures		Comment	Reference
305-2	Energy indirect (Scope 2) GHG emissions		23–24 Fact base: GHG Emissions Recording Methodology (83) Fact base: GHG Emissions: Scope 2 (84)
305-3	Other indirect (Scope 3) GHG emissions		23–24 Fact base: GHG Emissions Recording Methodology (83) Fact base: GHG Emissions: Scope 3 (84) Fact base: Emissions from Business Trips (85)
305-4	GHG emissions intensity		23–24 Fact base: GHG Emissions: Specific (Scope 1 and 2) (85)
305-5	Reduction of GHG emissions		23–24 Fact base: GHG Emission Reduction Measures (85)
305-6	Emissions of ozone-depleting substances (ODS)		Fact base: Air Pollutants (86)
305-7	Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions		Fact base: Air Pollutants (86)
Effluents and Waste			
103/306	Management Approach		15–20
306-2	Waste by type and disposal method		25 Fact base: Waste Volume (87) Fact base: Waste Saving Measures and Further Potentials (87) Fact base: Waste Disposal (88)
306-3	Significant spills	Voith is not aware of any significant incidents.	
306-4	Transport of hazardous waste		25 Fact base: Hazardous Waste (88)
306-5	Water bodies affected by water discharges and/or runoff		27–28 Fact base: Water and Neighboring Habitat Protection (91)
Environmental Compliance			
103/307	Management Approach		9–12; 17
307-1	Non-compliance with environmental laws and regulations	Voith is not aware of any significant incidents.	17 Fact base: Breaches of Compliance Regulations (77)

Disclosures		Comment	Reference
Supplier Environmental Assessment			
103/308	Management Approach		60–63
308-1	New suppliers that were screened using environmental criteria		62–63 Fact base: Supplier Self Assessment (111) Fact base: Evaluation of Suppliers (112)
Social			
Employment			
103/401	Management Approach		29–30
401-1	New employee hires and employee turnover		32 Fact base: Employment Length (98) Fact base: Employee Turnover (99) Fact base: New Hirings (100)
401-3	Parental leave		Fact base: Parental Leave (97)
Labor/Management Relations			
103/402	Management Approach		29–30
402-1	Minimum notice periods regarding operational changes		Fact base: Details on Upholding Employee Rights (85)
Occupational Health and Safety			
103/403	Management Approach		35–39
403-1	Occupational health and safety management system		35–37
403-2	Hazard identification, risk assessment, and incident investigation		35 Fact base: Approach to Preventing or Dealing with Negative Health and Safety Impacts (192)
403-3	Occupational health services		37–39
403-4	Worker participation, consultation, and communication on occupational health and safety		36 Fact base: Employee Representation in Committees (102)
403-5	Worker training on occupational health and safety		37 Fact base: Occupational Safety Training (104)
403-6	Promotion of worker health		39
403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships		38

Disclosures		Comment	Reference
403-8	Workers covered by an occupational health and safety management system		35 Fact base: Certifications (79)
403-9	Work-related injuries		36 Fact base: Occupational Accidents (102–104)
Training and Education			
103/404	Management Approach		29–30; 32–35
404-1	Average hours of training per year per employee		34 Fact base: Training and Education & Career Development (101)
404-2	Programs for upgrading employee skills and transition assistance programs		33–35
404-3	Percentage of employees receiving regular performance and career development reviews		34 Fact base: Training and Education & Career Development (101)
Diversity and Equal Opportunity			
103/405	Management Approach		29–32
405-1	Diversity of governance bodies and employees		31–32 Fact base: Employment Ratio of People with Disabilities (96) Fact base: Diversity in the Management Team and in the Workforce (96) AR 2019: 16 http://voith.com/corp-en/about-us/company/corporate-board-of-management.html
Non-discrimination			
103/406	Management Approach		29–32
406-1	Incidents of discrimination and corrective actions taken	Voith did not receive reports of any significant incidents in the reporting period.	30–31
Freedom of Association and Collective Bargaining			
103/407	Management Approach		29–30; 60–63 Fact base: Details on Upholding Employee Rights (95) http://voith.com/corp-de/coc-english.pdf
407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	Voith did not receive reports of any significant incidents in the reporting period.	62 Fact base: Details on Upholding Employee Rights (95)

Disclosures		Comment	Reference
Child Labor			
103/408	Management Approach		9–12; 30; 60–61 http://voith.com/corp-de/coc-english.pdf http://voith.com/us-en/brochures_modern_slavery_en.pdf
408-1	Operations and suppliers at significant risk for incidents of child labor	Voith did not receive reports of any significant incidents in the reporting period.	62
Forced or Compulsory Labor			
103/409	Management Approach		9–12; 30; 60–61 http://voith.com/corp-de/coc-english.pdf http://voith.com/us-en/brochures_modern_slavery_en.pdf
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	Voith did not receive reports of any significant incidents in the reporting period.	62
Security Practices			
103/410	Management Approach	We ensure our employees are protected mainly by working together with external service providers. Like all our service providers, they are subject to Voith's General Purchasing Conditions. Like Voith's own security personnel, they are likewise obligated to comply with the Code of Conduct.	http://voith.com/corp-de/coc-english.pdf http://voith.com/us-en/brochures_modern_slavery_en.pdf
410-1	Security personnel trained in human rights policies or procedures	Security service providers are obligated to support compliance with the Code of Conduct by suitable means. Voith does not currently have any data on training held by our service providers.	Fact base: Compliance Guidelines for External Security Personnel (77)
Human Rights Assessment			
103/412	Management Approach		9–12; 30; 60–61 http://voith.com/corp-de/coc-english.pdf
412-2	Employee training on human rights policies or procedures		10; 62 Fact base: Compliance Training (77) Fact base: Scope of Training (111)
412-3	Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	Global respect for basic human rights is enshrined in our Code of Conduct. All investment decisions are subject to this code.	

Disclosures		Comment	Reference
Supplier Social Assessment			
103/414	Management Approach		9–12; 60–63
414-1	New suppliers that were screened using social criteria	When reviewing existing and new suppliers, Voith always takes their working practices into consideration. A separate evaluation of the percentage of new suppliers that have been reviewed is not available.	
Public Policy			
103/415	Management Approach		9–12
415-1	Political contributions		13–14
Customer Health Safety			
103/416	Management Approach		42–43; 47; 58–59
416-1	Assessment of the health and safety impacts of product and service categories		42–43; 47; 58–59
416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	Voith did not receive reports of any significant incidents in the reporting period.	
Customer Privacy			
103/418	Management Approach		12
418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	Voith did not receive reports of any significant incidents in the reporting period.	
Socioeconomic Compliance			
103/419	Management Approach		9–12
419-1	Non-compliance with laws and regulations in the social and economic area	Voith did not receive reports of any significant incidents in the reporting period.	

Fact base 2019

n. s. = not significant; n. a. = not available
n. d. = no data; n. r. = not recorded

1. Strategy and Integrity

1.1 Our Profile

Economic Indicators	Key Economic Figures in € millions	FY 2018/19	FY 2017/18 ¹⁾	FY 2016/17
	Revenues	4,276	4,209	4,224
	Operating result before non-recurring items	174	153	225
	Income before taxes	147	157	694
	Direct Economic Value Generated and Distributed in € millions			
	Direct economic value generated (= revenues)	4,276	4,209	4,224
	Economic value distributed			
	Operating costs	1,006	1,066	1,040
	Employee wages and benefits	1,479	1,441	1,408
	Payments to providers of capital	39	26	76
	Payments to government	57	67	82
	Community investments	n. d.	n. d.	n. d.
	Economic value retained	72	49	612
	Expenditures for Employees in € millions			
	Wages and salaries	1,220	1,189	1,159
	Social security contributions, retirement pensions, and assistance	260	252	240
	Business Area Portraits in € millions	FY 2018/19	FY 2017/18	FY 2016/17
	Revenues			
	Voith Hydro	1,147	1,103	1,381
	Voith Turbo	1,398	1,302	1,283
	Voith Paper	1,660	1,746	1,527
	Voith Digital Ventures ²⁾	62	40	13
	Germany	709	563	558
	Europe	1,184	1,185	1,096
	Americas	1,213	1,067	1,195
	Asia	1,032	1,253	1,111
	Other	138	141	264
	EBIT³⁾			
	Voith Hydro	50	61	106
	Voith Turbo	76	75	91
	Voith Paper	111	102	107
	Voith Digital Ventures ²⁾	-22	-35	-43

¹⁾ Data provided for the 2017/18 fiscal year were corrected retrospectively.

²⁾ Independent segment only since 2016/17; previously in process of being established.

³⁾ EBIT adjusted for non-recurring items replaces profit from operations, stated in previous years as the central performance indicator for operating results; previous year's figure is adjusted; the 2016/17 figure is Profit from operations.

Economic Indicators	Taxes paid by region in € thousands	FY 2018/19	FY 2017/18	FY 2016/17
	Total	57,000	67,000	93,036
International Focus	Locations by Regional Distribution			
	Sales Markets in %	FY 2018/19	FY 2017/18	FY 2016/17
	Germany	17	13	13
	Europe excluding Germany	28	28	26
	Americas	28	26	28
	Asia	24	30	27
	Other	3	3	6
	Main sales markets by country in € millions	FY 2018/19	FY 2017/18	FY 2016/17
	Germany	709	563	n. d.
China	590	780	n. d.	

1.2 Strategy and Organization

Memberships and Association Voith and its Group companies represent their interests through approx. 570 different association memberships, on which we spend around €2.1 million (previous year: around €2.2 million) annually on membership fees.

- Verband Deutscher Maschinen- und Anlagenbauer e. V. (VDMA) (German Engineering Federation)
- Südwestmetall Verband der Metall- und Elektroindustrie Baden-Württemberg e. V. (SWM) (Baden-Württemberg Employers' Association of the Metal and Electrical Industry)
- FVA Forschungsvereinigung Antriebstechnik e. V. (Research Association for Power Transmission Engineering)
- Deutsches Institut für Normung e. V. (DIN) (German Standards Institute)
- Verband der Bahnindustrie in Deutschland e. V. (VDB) (German Railway Industry Association)
- Förderkreis der Deutschen Industrie e. V. (Society for the Advancement of German Industry)
- International Hydropower Association (IHA)
- Paper Machine Clothing Association
- National Hydropower Association

1.3 Values and Compliance

Compliance Training	Number of Employees who Underwent Further Training	FY 2018/19	FY 2017/18	FY 2016/17
Management from the upper four levels, new managers at the Voith Academy, Sales, Sourcing (1 day)		604	949	542
Decentralized training by compliance officer (1.5 hours)		600	1,095	1,479
Instruction by supervisor (0.5 hours)		956	1,659	2,699
Compliance officers (2 days)		18	17	34
	Number of Training Sessions			
Management from the upper four levels, new managers at the Voith Academy, Sales, Sourcing (1 day)		29	34	23
Decentralized training by compliance officer (1.5 hours)		n. r.	n. r.	n. r.
Compliance officers (2.5 days)		2	2	2
Employees trained in compliance in %		100	100	100
Compliance officers trained in %		100	100	100
Compliance Guidelines for External Security Personnel	Voith appoints external security personnel at the majority of its locations and construction sites for cost reasons. Voith does not train these external security personnel on the Voith Code of Conduct.			
Escalation Paths	<ul style="list-style-type: none"> • Compliance Officer • Group Division Compliance Officer • Compliance Committee • Corporate Board of Management • Supervisory Board 			
Breaches of Compliance Regulations	Compliance-Helpdesk Number	FY 2018/19	FY 2017/18	FY 2016/17
	Reports via the Compliance Helpdesk (no complaints regarding suppliers)	0	0	0
	of which reported violations against environmental standards	0	0	0
	of which reported violations against social standards	0	0	0
	Note: The Voith Code of Conduct is an integral part of our compliance training.			

1.4 Responsibility for Society

Donations and Sponsorship	Donations and Sponsorship in € millions	FY 2018/19	FY 2017/18	FY 2016/17
	Voith Group	2.27	1.64	2.95
	of which donations	1.23	0.71	1.91
	of which sponsorships	1.04	0.93	1.04
	Sponsorship Aid by Project in %			
	Education	49	28	54
	Social affairs	8	12	9
	Sport	39	52	32
	Culture	4	7	3
	Sponsorship Aid by Region in %			
	Germany	88.0	83.6	85.7
	Europe excluding Germany	6.0	1.5	5.9
	Americas	3.0	3.8	3.1
	Asia	3.0	8.3	3.8
	Other	0.0	2.8	1.5
Donations and Sponsorship for Political Parties and Party-political Organizations	Financial Contributions to Political Organizations in € thousands	FY 2018/19	FY 2017/18	FY 2016/17
	Germany	0	0	50
	Europe excluding Germany	0	0	0
	Americas	0	0	0
	Asia	0	0	0
	Other	0	0	0
	Total	0	0	50

In accordance with the specific Group Directive, donations to political parties and comparable party-political organizations, as well as sponsorships for the activities of such political parties and organizations (e.g. events, campaigns, etc.), always require the explicit approval of the Corporate Board of Management of Voith GmbH & Co. KGaA.

2. Environment

2.1 Environmental Management Approach

2.1.1 Operational Environmental Protection

Certifications	Existing Voith-location Certifications ¹⁾ Number	FY 2018/19	FY 2017/18	FY 2016/17
	ISO 50001	9	9	n. r.
	ISO 14001	64	55	56
	ISO 9001	69	63	64
	OHSAS 18001	63	59	57
	Degree of Coverage based on Employees in %			
	ISO 50001	19	21	n. r.
	ISO 14001	81	77	77
	ISO 9001	74	81	81
	OHSAS 18001	81	78	78

Work Materials and Hazardous Materials Approval Process

In principle, before we introduce any new work materials or hazardous materials they first undergo a central and a local approval process.

First, specific material-related information and a safety data sheet for the material to be approved are drawn up and logged. The material-related information is then checked to see whether the material has already been recorded in the central hazardous materials database. If not, it is entered into the database.

This is followed by the central approval process in which a systematic and automated check is made against applicable legal regulations (e.g. the ECHA Candidate List or REACH annexes).

Thanks to prior central approval, downstream local approval can focus on workplace and site-specific topics (e.g. water protection area, local regulatory requirements, storage location, on-site transportation, disposal). This means that the use of centrally approved materials can still be blocked at a local level for location-specific reasons.

2.1.2 Efficient Use of Resources

Environmental Goals	Environmental Goals in %	FY 2018/19	FY 2017/18	FY 2016/17
	Reduction in specific energy consumption compared to 2011 / 12	-22.1	-17.6	-14.8
	Reduction in specific freshwater consumption compared to 2011 / 12	-40.3	-34.3	-34.1
	Reduction in specific waste volume compared to 2011 / 12	-19.5	-23.7	-31.6

Hot-spot Analysis Methodology

When conducting a hot-spot analysis, the consumption of each control and analysis level (i.e. region, Group Division, location, system, process) is determined and displayed graphically. Data is prepared both according to physical consumption and by associated cost, bringing transparency to "hot-spots" with high consumption levels and costs. Based on this, we develop and approximately evaluate project ideas before gradually developing them further using a stage-gate process through to implementation. As part of this, we employ economic and environmental evaluation criteria, in accordance with our Green Controlling cycle. We regularly review the distribution of consumption based on changing patterns and general conditions (location activities, economic activity, changes to the fleet of machines and plant, etc.).

¹⁾ Up to and including 2017/18 certification related exclusively to production locations; since 2018/19 we have included all company locations.

2.2 Performance in the Reporting Period

2.2.1 Energy Efficiency and Greenhouse Gas Emissions

Energy-saving Measures and Further Potentials

Reduction in Energy Consumption as a Direct Consequence of Conservation and Efficiency Drives in MWh

Reduktion des Energieverbrauchs

FY 2018/19

FY 2017/18

FY 2016/17

17,405

22,964

9,789

In the reporting period, amongst others the following savings were achieved:

- 10 GWh/a (3.470 t CO₂e/a) through energy-efficiency projects focused on space-heating and building-heating systems, in particular in Heidenheim, Shanghai, Crailsheim, Högsjö and Sonthofen
- 2.6 GWh/a (680 t CO₂e/a) through switching over energy sources in Ipoh and São Paulo
- 1.4 GWh/a (700 t CO₂e/a) through efficiency gains in production and finishing processes, in particular in Shanghai, Heidenheim, Garching and Crailsheim
- 950 MWh/a (300 t CO₂e/a) were replaced by renewables projects in Crailsheim and Sonthofen
- 860 MWh/a (350 t CO₂e/a) through lighting projects, in particular in Heidenheim, Kunshan, Salzgitter and Garching
- 760 MWh/a (330 t CO₂e/a) through compressed air projects in São Paulo, Karawang, Kiel and Shanghai

Energy Saving Potential in GWh

FY 2018/19

FY 2017/18

FY 2016/17

Energy saving potential since FY 2011/12

135.3

130.8

123.7

of which achieved in the FY

17.4

23.0

9.8

savings already achieved since FY 2011/12

125.2

106.3

83.4

Method: Measures in scope on the location level are checked by the respectively responsible Ecological Business Manager for their effectiveness. Measures controlling is carried out centrally via a measures tool. A regular exchange between the Ecological Business Management experts serves to identify further potentials, compare processes, define benchmarks and implement the respective optimal solutions at Voith through sharing best practices.

Energy Consumption:
Total

Total Energy Consumption in MWh

484,656

502,370

522,528

Production-related energy consumption

420,040

432,237

452,265

Business travel

47,789

52,648

53,066

Logistics

16,828

17,485

17,197

Total Energy Consumption in %

Scope 1

30

30

30

Scope 2

61

61

60

Scope 3

9

9

9

Data-gathering: The required unit of data is gathered, validated, and evidenced centrally each month by means of a data-gathering process at the locations. The units are converted in the database. Energy use (total, renewable, non-renewable); total biomass + renewable energy sources; total energy use for own fleet from non-renewable energy sources was 1,744,763 FY.

Direct Energy Consumption: Scope 1	Direct Energy Consumption (Scope 1) in MWh	FY 2018/19	FY 2017/18	FY 2016/17
	Direct energy consumption in production	123,408	125,723	136,539
	Direct energy consumption of the Voith vehicle fleet	22,157	22,491	22,492
	Company cars ¹⁾	5,329	5,005	5,295
	Logistics	16,828	17,485	17,197
	Natural gas in %	81	82	83
	Heating oil in %	4	5	4
	Diesel in %	5	6	6
	LPG in %	9	8	7
	Biomass/biogenic energy sources in %	1	–	–
	Other renewable energy sources and captive generation of renewable energy	< 1	< 1	< 1
	Other	0	0	0
	Data-gathering: The required unit of data is gathered, validated, and evidenced centrally each month by means of a data-gathering process at the locations. The units are converted in the database.			
Indirect Energy Consumption: Scope 2	Indirect Energy Consumption (Scope 2) in MWh	FY 2018/19	FY 2017/18	FY 2016/17
	Indirect energy consumption (purchased and captive, only if the fuels are not included above)	296,632	306,514	315,726
	Electricity	233,005	237,354	242,735
	Long-distance heating	56,173	61,338	63,774
	Steam	7,454	7,822	9,216
	Energy sold	288	346	125
Indirect Energy Consumption: Scope 3	Indirect Energy Consumption (Scope 3)	FY 2018/19	FY 2017/18	FY 2016/17
	Business travel in MWh	42,460	47,642	47,771
	Rail in %	1	1	< 1
	Car (not belonging to the Voith fleet, e.g. rental cars) in %	7	7	7
	Flight (short-distance) in %	4	4	2
	Flight (long-distance) in %	89	88	90
	Logistics (upstream and downstream) in MWh	n. a.	n. a.	n. a.
	Rail in %	n. a.	n. a.	n. a.
	Truck in %	n. a.	n. a.	n. a.
	Ship in %	n. a.	n. a.	n. a.
	Flight in %	n. a.	n. a.	n. a.
	Note: Logistics data are gathered via external logistics service providers. However, these data are not reported here due to a reengineering of the existing process in the reporting year. We are working on making this data reportable next year, and are checking the data gathering process for further Scope 3 emissions.			

¹⁾ Company cars do not include: taxis, employees' personal cars, rental cars.

Production-related Energy Consumption	Specific Production-related Energy Consumption (Scope 1 and 2) in MWh/€ million revenues	FY 2018/19	FY 2017/18	FY 2016/17
		Specific energy consumption (Scope 1 and 2)/revenues	98.1	102.7
	Production-related Energy Consumption (Scope 1 and 2) by Region			
	Total energy consumption in MWh	420,040	432,237	452,265
	Germany in %	35.9	36.1	35.9
	Europe excluding Germany in %	12.5	12.6	13.2
	Americas in %	32.1	31.4	32.0
	Asia in %	19.4	19.8	18.8
	Other in %	0.1	0,1	0,1
	Reduction of Production-related Energy Consumption in %			
	Reduction in production-related energy consumption versus previous year	-2.8	-3.5	0.2
	Reduction of direct energy consumption	-1.8	-7.1	-4.5
	Reduction of indirect energy consumption	-3.2	-1.9	2.3
	Key Drivers of Energy Consumption in %			
	Heating and cooling energy	30.3	30.5	31.1
	Paper machine clothing production	25.5	25.2	26.2
	Machine tool operation	5.5	4.2	3.8
	São Paulo foundry	6.3	6.0	5.8
Proportion of Direct and Indirect Energy	Direct and Indirect Energy in %			
	Proportion of direct energy	29.4	29.1	30.2
	Proportion of indirect energy	70.6	70.9	69.8
Renewable Energies	Energy from Renewable and Non-renewable Resources in %			
	Proportion of direct energy	24.9	21.5	19.2
	Proportion of indirect energy	75.1	78.5	80.8
Electricity Mix	Electricity Mix in %			
	Renewable resources	44.5	38.5	35.4
	Non-renewable resources	55.5	61.5	64.6

GHG Emissions
Recording Methodology

In gathering data on GHG emissions, Voith follows the guidelines of the Greenhouse Gas (GHG) Protocol. With the aid of conversion factors, data on GHG emissions such as CH₄, N₂O, HCF, PFC and SF₆ are gathered, recorded and integrated as CO₂ equivalents.

Data are recorded and gathered monthly on all material direct energy consumption sources in management scope. In 2018/19 the overall level of coverage was 90 % of total energy consumption. At smaller locations outside management scope, data on annual energy consumption by consumption source is gathered at irregular intervals. Based on the development of employee headcount the energy consumption figures given are adjusted for the respective reporting year. In addition, we derive consumption-per-capita rates, differentiated by office and service units. Based on these rates we produce estimates for our smallest organizational units. This consumption is indexed by energy-consumption source according to the consumption index for our smallest organizational units.

The applicable emissions factors for direct energy consumption are taken from Defra publications or Voith's own GaBi database, according to their availability. Our locations can adjust them for location-specific factors (e.g. for LGP or natural gas) if they provide the corresponding proof, thus contributing to raising calculation accuracy. The GHG impact of refrigerant emissions is also calculated. The consumption levels and GHG impact of refrigerants is recorded globally for 17 different refrigerants (R-11, R-12, R-123 etc.).

The GHG emissions of indirect sources of energy consumption are calculated both on a location-specific and on a market-specific basis. The emissions factors and the underlying grid mix are reported and documented annually by those locations in management scope, based on the data supplied by the respective energy utility. The market-based data reported under this method are compared centrally with location-based data from the IEA, checked for plausibility, and validated. Ecological Business Management acts in a consultancy function to the locations, for instance at locations with complex energy sourcing through contracting or self-generation. Integrating location-based factors provides an additional control of the reported market-based factors. In the reporting year the difference between the location-based and market-based GHG emissions was 3,396 t CO₂e. Here, the location-based GHG factors were slightly higher on average than the market-based factors.

The data-gathering and recording process as well as the level of coverage of Scope 3 emissions are currently being reengineered. Data on GHG emissions from business travel are gathered and calculated on the basis of the kilometers flown, driven (e.g. in rental cars), or traveled by train, as recorded and reported by Voith's travel agency. The emissions factors are taken from the German Federal Environment Agency database ProBas. Logistics data are gathered via the external logistics services providers; however, in view of the current process reengineering in the reporting year, they are not reported here.

GHG Emissions	Greenhouse Gas Emissions in t CO ₂ eq	FY 2018/19	FY 2017/18	FY 2016/17
Total energy consumption		144,338	166,240	174,227
Production-related energy consumption		128,703	147,035	155,048
Business travel		12,125	14,324	14,397
Logistics		3,509	4,882	4,783
Total energy consumption in %				
Scope 1		21	18	19
Scope 2		72	72	73
Scope 3		8	8	8
Production-related Greenhouse Gas Emissions (Scope 1 and 2) by Region				
Total GHG emissions in t CO₂eq		127,663	144,466	153,376
Germany in %		29	29	28
Europe excluding Germany in %		4	4	5
Americas in %		27	26	28
Asia in %		40	41	39
Other in %		0	< 1	< 1

GHG Emissions: Scope 1	Direct Greenhouse Gas Emissions (Scope 1)	FY 2018/19	FY 2017/18	FY 2016/17
	Direct energy consumption in production in t CO ₂ eq	23,628	24,419	26,441
	Direct energy consumption of the Voith vehicle fleet in t CO ₂ eq	6,068	6,149	6,095
	Company cars ¹⁾	1,366	1,267	1,312
	Logistics	4,701	4,882	4,783
	Volatile greenhouse gas emissions in t CO ₂ eq	1,040	2,569	1,673
	Natural gas in %	78	78	79
	Heating oil in %	5	6	6
	Diesel in %	6	8	7
	LPG in %	10	8	7
	Biomass/biogenic energy sources in %	< 1	–	–
	Other renewable energy sources and captive generation of renewable energy in %	–	–	–
	Other in %	–	0	0
	Note: In FY 2016/17 volatile GHG emissions were recorded for the first time as production-related emissions.			
GHG Emissions: Scope 2	Indirect Greenhouse Gas Emissions (Scope 2) in t CO ₂ eq	FY 2018/19	FY 2017/18	FY 2016/17
	Indirect energy consumption (purchased and captive, only if the fuels are not included above)	104,035	120,047	126,934
	Electricity	85,382	99,873	104,969
	Long-distance heating	14.389	15.795	16,469
	Steam	4,264	4,379	5,495
	Energy sold	161	194	70
GHG Emissions: Scope 3	Indirect Greenhouse Gas Emissions (Scope 3)	FY 2018/19	FY 2017/18	FY 2016/17
	Business travel in CO ₂ eq	11,633	13,057	13,084
	Rail in %	< 1	< 1	< 1
	Car (not belonging to the Voith fleet, e.g. rental cars) in %	7	8	6
	Flight (short-distance) in %	4	4	2
	Flight (long-distance) in %	89	89	92
	Logistics (upstream and downstream) in t CO ₂ eq	n. a.	n. a.	n. a.
	Rail in %	n. a.	n. a.	n. a.
	Truck in %	n. a.	n. a.	n. a.
	Ship in %	n. a.	n. a.	n. a.
	Flight in %	n. a.	n. a.	n. a.

Note: Only the stated sources of energy consumption and GHG emissions have so far been able to be recorded with reference to Scope 3. We are working to include other material sources of energy consumption and GHG emissions in our calculations.

We gather logistics data via our logistics service providers. To be able to provide even more accurate statements regarding transport-related CO₂ emissions differentiated by mode of transport in tonne-kilometers, Voith has decided to develop new calculation methodologies in collaboration with its external service providers and partners. We currently plan to present the results by the end of FY 2020/21 and have therefore decided not to publish any logistics data for the reporting year.

¹⁾ Company cars do not include: taxis, employees' personal cars, rental cars.

GHG Emissions: Specific (Scope 1 and 2)	Specific Production-related Greenhouse Gas Emissions (Scope 1 and 2) in t CO ₂ eq/€ million revenues	FY 2018/19	FY 2017/18	FY 2016/17
	Specific greenhouse gas emissions (Scope 1 and 2)	29.8	34.3	36.3
GHG Emission Reduction Measures	Reduction in Energy Consumption as a Direct Consequence of Conservation and Efficiency Drives			
	Reduction in GHG emissions in t CO ₂ eq	6,003	7,367	7,456
	Reduction in Production-related CO₂eq Emissions			
	Reduction in production-related CO ₂ e emissions versus previous year in %	-11.6	-5.8	1.9
	Reduction in direct CO ₂ e emissions in %	-3.2	-7.6	-13.5
	Reduction in indirect CO ₂ e emissions in %	-13.3	-5.4	5.7
	See energy consumption reduction measures.			
Emissions from Business Trips	<p>Wherever possible we avoid taking unnecessary business trips, which is why we are increasingly using video and telephone conferencing in our global organization to save on travel expenses and allow speedy coordination.</p> <p>Furthermore, every quote provided by our travel agency partner automatically shows the CO₂e emissions generated by a particular means of transport, providing transparency to Voith travelers when choosing their means of transport in terms of CO₂e emissions.</p> <p>In addition we predominantly lease the vehicles in our vehicle fleet, and we replace them every three years with the next generation of lower-emission vehicles.</p> <p>In the reporting period we reduced long-haul flights by 10.0 % to 69.1 million km (previous year: 77.2 million km). Business travel kilometers by road in private or leased cars declined by 16 % to 5.0 million km, while kilometers driven in our own vehicle fleet and the volume of business travel by rail did not change significantly versus the previous reporting year (see GHG emissions by scope).</p>			
Emissions Trading	Voith does not participate in the European emissions trading scheme.			

Air Pollutants	Air Pollutants ¹⁾ in t	FY 2018/19	FY 2017/18	FY 2016/17
	Chlorofluorocarbons (CFCs) ²⁾	< 1	< 1	< 1
	Hydrochlorofluorocarbons (HCFCs) ²⁾	< 1	< 1	< 1
	Halon ²⁾	n. s.	n. s.	n. s.
	Methyl bromide (CH ₃ Br) ²⁾	n. s.	n. s.	n. s.
	Volatile organic compounds (VOC)	399	730	689
	Non-methane volatile organic compounds (NMVOCs)	35	162	135
	Persistent organic pollutants (POPs)	n. s.	n. s.	n. s.
	Hazardous air pollutants (HAPs)	24	26	27
	Dust emissions	163	200	197
	Respirable fraction	138	154	151
	Heavy metals	3	3	3
	Nitrogen oxides (NO _x)	278	640	592
	Sulfur oxides (SO _x)	350	521	490
	Sulfur hexafluoride (SF ₆)	< 1	< 1	< 1

n. s. = not significant

The indicators for other air pollutants are calculated, based on LCI conversion factors, from the reported energy consumption, logistics and business-travel data. Other air pollutants from energy consumption sources generally dominate. We additionally gather data on emissions from refrigerants, solvents, heavy metals, and dust from non-energy based production processes.

In the reporting year, significant sources of VOC emissions were business travel at 85 t (previous year: 89 t), while production-related VOC emissions of 52 t (previous year: 70 t) were a major contributor to NMVOC emissions. NMVOC emissions arise in approximately equal measure from coatings, painting, and cleaning processes; the decline in this emissions indicator is due to an improved materials separation process, in particular at our locations in China.

Regarding dust emissions, a single major source at 18 t (previous year: 19 t) is our foundry in São Paulo, Brazil. Dust emissions arise mainly from steel conversion, which is not affected by the local decline in production.

2.2.2 Material Efficiency and Waste

Materials Used	Materials Used by Weight in t	FY 2018/19	FY 2017/18	FY 2016/17
	Total materials/raw materials used	197,962	215,003	220,001
	Raw material	63,968	60,892	57,305
	Semifinished products	107,327	133,020	143,147
	Packaging	21,949	16,521	14,437
	Auxiliaries	4,718	4,570	5,111
	Renewable materials in %	11	8	6
	Secondary raw materials in %	42	38	38

Voith employs country-specific recycling factors to calculate the proportion of secondary raw materials in terms of the overall amount of materials used.

¹⁾ Production-related energy consumption was recorded as well as air pollutants from the transport of goods and business travel.

²⁾ Ozone-degradable substances in t CFC-11e.

Waste Volume	Waste by Region in %	FY 2018/19	FY 2017/18	FY 2016/17 ¹⁾
	Germany	35	38	39
	Europe excluding Germany	6	7	7
	Americas	38	31	32
	Asia	20	24	23
	Other	< 1	< 1	< 1
	Reclaimed and Removed Waste by Method in t			
	Reclaimed waste	23,216	23,167	20,819
	Reused	200	227	122
	Recycled	18,575	18,125	15,761
	Composted	200	207	185
	Recovered	3,878	4,212	4,230
	Other reclamation	363	396	521
	Removed waste	13,479	10,905	9,896
	Incinerated	3,098	3,339	2,885
	Dumped at an external site	10,381	7,566	7,011
	Dumped at a company site		-	-
	Other removal		-	-
	Total waste	36,766	34,136	30,786
	Note: Alongside the type of waste, the locations also enter the manner of disposal in our database.			
Waste Saving Measures and Further Potentials	Reduction in Specific Waste Quantities	FY 2018/19	FY 2017/18	FY 2016/17
	Reduction in specific waste quantities in %	5.9	11.2	-16.2
	Specific Waste Weight			
	Specific waste weight in t/€ million revenues	8.6	8.1	7.3
	The individual locations work continually towards specific solutions to overcome local challenges regarding waste. For instance, in some countries pooling solutions for palettes are unattractive due to low order volumes. Here, reusable or repairable palettes are transferred to local processing providers where possible, to achieve a high standard of reusable materials. At other locations, cardboard packaging is transformed onsite into product packaging to enable the safe delivery of our products to the customer.			
	In the reporting period the following waste savings were achieved, amongst others:			
	• 240 t/a through reductions in grinding sludge and coolant lubricant emulsion through process improvements at our locations in Dongying, Liaoyang, Karawang and Weißenborn			
	• 200 t/a in polymer and synthetic materials waste through process improvements at our locations in Shreveport, Summerville and Florence			
	• 32 t/a in waste packaging through the reuse of transport crates at our at our São Paulo location			
	Material Efficiency Potential in t	FY 2018/19	FY 2017/18	FY 2016/17
	Efficiency Potential Since FY 2011/12	9,188	9,021	6,044
	of which achieved in the FY	266	4,174	640
	savings already achieved since FY 2011/12	8,808	8,596	4,423

¹⁾ Data provided for the 2016/17 fiscal year were corrected retrospectively.

Hazardous Waste	Hazardous and Non-hazardous Waste in t	FY 2018/19	FY 2017/18	FY 2016/17
	Hazardous waste	7,047	6,084	5,816
	transported hazardous waste	7,047	6,111	5,816
	imported hazardous waste	-	-	-
	exported hazardous waste	-	-	-
	waste transported nationally and internationally between Voith locations	-	-	-
	Non-hazardous waste	29,720	28,053	24,970
	Total waste	36,766	34,136	30,786

Waste Disposal The collection of hazardous waste at Voith is governed by internal regulations. Only qualified specialist waste disposal companies that adhere strictly to our regulations are permitted to dispose of our waste. Any violations are rigorously pursued and lead to termination of the business relationship. To check this, we regularly audit the waste disposal companies we use. The scope of these audits includes inspections of the waste disposal companies' sites and related plants, as well as the collection and documentation of proof of disposal.

2.2.3 Water

Water Consumption	Water Consumption by Source in m ³	FY 2018/19	FY 2017/18	FY 2016/17
	Total water withdrawal	956,219	1,033,788	1,042,539
	Freshwater (< 1.000 mg/L Total Dissolved Solids) ¹⁾	955,620	1,032,913	1,040,967
	Surface water	67,128	64,544	67,507
	Groundwater ¹⁾	493,133	470,508	442,722
	of which public as well as private water treatment plants	395,360	497,861	530,738
	other water (>1.000 mg/L Total Dissolved Solids)		-	-
	Data-gathering: Categories are gathered centrally by means of a data-gathering process at the locations.			

¹⁾Fresh water figures for FY 2015/16 have been retroactively corrected (approx. +40,000 m³). The geothermal water in Heidenheim has not been reported in the past.

Water Consumption	Water Consumption by Region in %	FY 2018/19	FY 2017/18	FY 2016/17¹⁾
	Germany	46	43	40
	Europe excluding Germany	12	10	11
	Americas	18	16	20
	Asia	23	30	29
	Other	1	1	< 1
	Percentage and Total Volume of Reused Water			
	Reused water in m ³	25.5	44.5	104.2
	Reused water in % of total water withdrawal	< 1	< 1	< 1
	Data-gathering: Categories are gathered centrally by means of a data-gathering process at the locations.			
Freshwater Savings Measures and Further Potentials	Specific Freshwater Consumption in m³/€ thousand revenues	FY 2018/19	FY 2017/18	FY 2016/17
	Specific Freshwater Consumption	0.22	0.25	0.25
	Among other achievements, the following savings were realized in the reporting year:			
	<ul style="list-style-type: none"> • 58,500 m³/a through leakage management and improvements to the sanitary system at our Shanghai location • 4,300 m³/a through process improvements to vacuum pumps at our Kunshan location • 800 m³/a by closing a water cycle at our Austell location 			
	Freshwater Efficiency Potential in 1,000 m³			
	Efficiency potential in planning since FY 2011/12	806	815	817
	of which additionally achieved in the FY	0	< 1	83
	savings already achieved since FY 2011/12	799	789	789
	Note: The savings achieved so far since FY 2011/12 are already above the volume of savings which Voith anticipates it needs in order to achieve its reduction goal in FY 2018/19.			

¹⁾ Figures for FY 2016/17 have been retrospectively corrected.

Wastewater by Method of Discharge and Quality

Wastewater by Method of Discharge	FY 2018/19	FY 2017/18	FY 2016/17¹⁾
Total wastewater in m ³	821,902	844,126	860,395
Discharged into the public sewage system in %	51.5	62.0	63.0
Discharged into surface water in %	48.0	25.0	27.0
Discharged into groundwater in %	0.5	13.0	10.0
Reused at another company in %	< 1	< 1	< 1
Total treated wastewater in m ³	115,955	160,957	156,192
Discharged into the public sewage system in %	54.9	68.0	69.0
Discharged into surface water in %	43.7	31.0	29.7
Discharged into groundwater in %	1.4	1.0	1.3
Reused at another company in %	–	–	–
Total untreated wastewater in m ³	705,947	676,699	704,203
Discharged into the public sewage system	50.9	61.0	62.0
Discharged into surface water in %	48.8	23.0	26.0
Discharged into groundwater in %	0.3	16.0	12.0
Reused at another company in %	< 1	< 1	< 1
Wastewater Quality²⁾ in t	FY 2018/19	FY 2017/18	FY 2016/17¹⁾
Biological oxygen demand (BOD)	9.4	8.2	9.3
Chemical oxygen demand (COD)	31.9	28.7	27.7
Total suspended matter content	9.6	8.1	8.0
Heavy metals	< 1	< 1	< 1
Nitrogen	1.3	1.0	2.0
Phosphorus	< 1	< 1	< 1

Note: Monitoring processes to measure and control locations' wastewater quality are designed to fulfill the respective local statutory requirements. The existence of monitoring processes is recorded via hse+. Currently 29% of total wastewater volume is covered by monitoring processes.

¹⁾ Data provided for the 2016/17 fiscal year were corrected retrospectively.

²⁾ The emissions in wastewater are based on the volume of wastewater streams from Voith locations subject to monitoring and the respective average of the measured concentrations.

Water and Neighboring Habitat Protection	Significant ¹⁾ direct Wastewater discharge in FY 2018/19 in %	Location	Wastewater discharged into	
	80 % of wastewater is returned to the natural water cycle. The water was previously used for cooling purposes. The discharged water is subject to strict observation, as the location is in a water protection zone.	Heidenheim	River Brenz	
10 % of wastewater is returned to the natural water cycle.	Garching	Groundwater		
95 % of wastewater is returned to the natural water cycle. The water was previously used for cooling purposes.	Högsjö (Sweden)	Lake Högsjö		
100 % of wastewater is returned to the natural water cycle.	Noida (India)	Yamuna River		
100 % of wastewater is returned to the natural water cycle. We have purification equipment locally with which the water is treated for discharge. The location is adjacent to a water protection zone.	São Paulo (Brazil)	Perus River		
45 % of cooling water is returned to the Schwarza.	Wimpassing (Austria)	River Schwarza		
Environmental Incidents	Environmental Incidents (Pollution of Soil, Water, etc.) Number	FY 2018/19	FY 2017/18	FY 2016/17 ²⁾
	Product and warehousing incidents	45	45	38
	Transport accidents: road, rail, inland waterway, sea	n. r.	n. r.	n. r.

¹⁾ "Significant" is considered to be wastewater discharged to surface water and to groundwater that exceeds 5 % of the total wastewater volume of the observed unit.

²⁾ Data provided for the 2016/17 fiscal year were corrected retrospectively.

3. Employees

3.1 Employees – Our Aspiration, Our Responsibility

Employee Structure	Consolidation Scope for Employee Numbers ¹⁾ Number	FY 2018/19	FY 2017/18	FY 2016/17
	Employees Group-wide in FTE (without apprentices)	19,410	19,535	19,045
	Employees Group-wide as a headcount	19,841	19,027	19,267
	Employees included in data analysis	19,841	19,027	19,267
	Employees by Gender, Age Group, and Region²⁾ Number as a headcount	FY 2018/19	FY 2017/18	FY 2016/17
	Voith Group	19,841	19,027	19,267
	Number by Gender			
	Women	3,638	3,477	3,415
	Men	16,203	15,550	15,852
	Number by Age			
	< 30 years	2,546	2,435	2,517
	30–50 years	10,967	10,450	10,714
	> 50 years	6,328	6,142	6,036
	Number by Origin			
	German	7,708	7,539	7,306
	non-German	12,133	11,488	11,961
	Number by Regions			
	Germany	8,133	7,950	7,669
	Europe excluding Germany	2,922	2,858	2,879
	Americas	3,952	4,133	4,748
	Asia	3,395	3,380	3,286
	Other	1,439	706	685
	Number by Main Countries			
	Germany	8,133	7,950	7,581
	China	2,513	2,549	2,510
	USA	1,979	1,906	2,034
	India	1,439	706	685
	Brazil	1,358	1,590	2,008
	Austria	953	933	941

¹⁾ In contrast to the procedure applied in compiling the Annual Report, in the Sustainability Report workforce figures are stated as headcount instead of FTEs. For FY 2017/18 consolidated companies are in reporting scope, just as they are for the Annual Report; however, employee-level figures in the workforce master data for the FlowLink and Ray Sono participations will only be available from FY 2018/19 onward.

²⁾ Due to part-time work the regional distribution in headcount and FTE (full time equivalents) differs from the Annual Report.

Employee Structure

The Group Division Voith Hydro shed 162 jobs in the reporting year in workforce adjustments due to the market situation. Some of those affected found a new role in other areas of the company or regions. In the Group Divisions Paper and Turbo, employee numbers largely remained constant. In the Digital Ventures Group Division, the workforce at the end of the fiscal year comprised 2,280 FTE positions (previous year: 2,256 positions). The modest increase in employee numbers in Digital Ventures is attributable to the acquisition of Pilotfish (32 positions) and the recently founded joint venture TSP OnCare Digital Assets. Conversely, workforce numbers fell by 73 positions in the central Group areas, where synergies were realized through the optimization of corporate structures.

We utilized every option available, such as deliberate hiring freezes for certain business areas or countries, the targeted use of working-hours accounts, and early retirement offers where appropriate, to prevent our employees having to face hardship due to job losses. When making headcount reductions, Voith offers support such as advisory services and severance payments in accordance with local frameworks.

Our core workforce is structured according to the principle of commercial prudence. Workforce flexibility, including the use of temporary employment, enables us to manage order peaks and therefore to respond quickly and flexibly in markets that can be very volatile. The engagement of employees from external companies is governed by a Group Directive. In the reporting year, we employed 1,050 staff (previous year: 1,239) through recruitment agencies. The number of fixed-term employment contracts fell in the reporting year by 2.5% to 1,945 (previous year: 1,995).

Employees by
Employment Type

Full-time and Part-time Employees by Age and Gender Number	FY 2018/19	FY 2017/18	FY 2016/17
Full-time	18,727	18,007	18,323
Women	2,870	2,766	2,748
Men	15,857	15,241	15,575
< 30 years	2,449	2,325	2,456
30–50 years	10,406	9,953	10,199
> 50 years	5,872	5,729	5,668
Part-time	1,114	1,020	944
Women	768	711	667
Men	346	309	277
< 30 years	97	110	61
30–50 years	561	497	515
> 50 years	456	413	368
Employees with Temporary and Permanent Employment Contracts by Gender Number	FY 2018/19	FY 2017/18	FY 2016/17
Permanent employment contract	17,896	17,032	17,360
Women	3,196	3,033	2,977
Men	14,700	13,999	14,383
Temporary employment contract	1,945	1,995	1,907
Women	442	444	438
Men	1,503	1,551	1,469
Temporary employees	1,050	1,239	949
Women	227	250	176
Men	823	989	773

Employees by Employment Type	Total Workforce by Employees and Supervised Workers by Gender Number	FY 2018/19	FY 2017/18	FY 2016/17
	Employees / workers	19,841	19,027	19,267
	Women	3,638	3,477	3,415
	Men	16,203	15,550	15,852
	Supervised workers	1,050	1,239	949
	Women	227	250	176
	Men	823	989	773

In the reporting year Voith employed 1,050 workers through temporary employment agencies (previous year: 1,239). Temporary employment is a commonplace instrument in the sector to meet short-term order peaks.

3.2 Highly Attractive Employer

Voith in Selected Employer Rankings

In the reporting period, the respective target groups of the Trendence and Universum studies rated Voith as an attractive employer:

- Trendence Study 2020: In the target group “Young Professionals”, Voith achieved 26th place (previous year: 27 th) in the Machinery and Plant Engineering sector as well as 13th place (previous year: 22 nd) in the Engineering Services sector. The study related to the year 2019 and involved a total of 120 companies in various industrial sectors.
- Universum Study: In the target group “Young Professionals”, Voith was placed 49th (previous year: 61st), once again finishing in the first half of the total of 140 listed companies in Germany.

Expenditures for Employees	Employee Wages and Benefits in € millions	FY 2018/19	FY 2017/18	FY 2016/17
Wages and salaries		1,220	1,194	1,165
Social security contributions, retirement pensions, and benefits		259.5	253.1	250.6
Remuneration of the Corporate Board of Management		n. d.	n. d.	n. d.

Note: See the chapter “Remuneration of governing bodies” in the Annual Report.

Details on Upholding Employee Rights

Collective Bargaining Agreements in %	FY 2018/19	FY 2017/18	FY 2016/17
% of employees covered by collective bargaining agreements	72	81	77
of which in Germany	97	100	100

In accordance with our Code of Conduct and Group Directives, Voith rejects all forms of obstruction to lawful employee representation (such as obstructing the freedom of association and collective bargaining agreements) and always complies with the respective local legislation.

We view trusting collaboration with employee representatives as a central prerequisite for our company’s long-term success. As such, we always involve employee representatives in discussions between the Group management, local HR departments, and employees. Within the individual countries, labor relationships are structured in accordance with national laws, collective wage agreements, and company agreements. Our compliance processes ensure that agreements are also upheld.

Our Corporate Board of Management or the local management team communicate fundamental changes to employees at all our sites in a timely manner and at an early stage. To do this, we employ a range of communication channels, particularly our intranet, video and telephone conferencing facilities, as well as our employee magazines. In Germany, the decision-making process is subject to co-determination if fundamental changes are made with regard to the company. Implementation of the measures taken is supported by the respective locations’ Works Councils.

Diversity in the Management Team and in the Workforce/Employment Ratio of People with Disabilities	Employment Ratio of People with Disabilities in %	FY 2018/19	FY 2017/18	FY 2016/17
	Employment ratio of people with disabilities	3.6	3.4	3.3
	Diversity in Senior Management Circle Number			
	Senior Management Circle ¹⁾	73	74	77
	Proportion of women in %	8.2	6.8	5.2
	Non-German members in %	27.4	31.1	35.1
	Verteilung von Frauen und Männern auf Managementebenen Number			
	Corporate Board of Management, Executive Team, Senior Management Circle¹⁾ Number	80	80	84
	Proportion of women in %	7.5	6.3	4.8
	Non-German members in %	27.5	30.0	33.3
	Regional directors/chairpersons, Management Board of operating units, heads of product groups, managers in Group management functions²⁾ Number	367	379	367
	Proportion of women in %	6.8	8.2	7.6
	Non-German members in %	49.3	49.1	50.7
	Mid- and lower-level management³⁾ Number	669	688	715
	Proportion of women in %	12.4	11.8	10.6
	Non-German members in %	60.1	61.5	60.1
	Total (across all management levels) Number	1,116	1,147	1,166
	Proportion of women in %	10.2	10.2	9.3
	Non-German members in %	54.2	55.2	55.2
	Various nationalities Number	94	91	88
Flexible Working Time Models	Flexible Working Time Models Number	FY 2018/19	FY 2017/18	FY 2016/17
	Voith Group	12,056	7,950	7,669
	Women	2,246	1,510	1,383
	Men	9,810	6,440	6,286
	< 30 years	1,422	1,027	916
	30–50 years	5,850	3,910	3,909
	> 50 years	4,784	3,013	2,844
The figures stated are for all regions. Internationally, flexible working time models are available to employees in most regions. The figures given are for Germany; as a general rule, all Voith employees can agree individual working time models with their supervisor. This also applies to sabbaticals.				

¹⁾ Management levels 1 + 2

²⁾ Management levels 3 + 4

³⁾ Management levels 5

Parental Leave	Parental Leave Number	FY 2018/19	FY 2017/18	FY 2016/17
	Employees Entitled to Parental Leave			
	Voith Group	18,413	18,867	19,074
	Women	3,505	3,452	3,390
	Men	14,908	15,415	15,684
	Total Parental Leave Take-up			
	Voith Group	509	461	668
	Women	181	186	139
	Men	328	275	529
	Germany	433	384	436
	Europe excluding Germany	50	53	39
	Americas ¹⁾	20	21	190
	Asia	2	3	3
	Other	4	0	0
	Employees Who Returned to Voith After Parental Leave			
	Voith Group	370	366	578
	Women	86	83	112
	Men	284	283	466
	Employees Who Returned to Voith After Parental Leave Who are Still at Voith 12 Months After Returning			
	Voith Group	275	345	351
	Women	69	43	63
	Men	206	302	288
	Return-to-work Rate in %			
	Voith Group	72.7	79.4	79.1
	Women	47.5	44.6	74.2
	Men	86.6	100.0	80.3
	Retention Rate Among Employees Who Took Parental Leave in %			
	Voith Group	74.3	94.3	62.1
	Women	80.2	51.8	69.2
	Men	72.5	100.0	60.8

¹⁾ Until FY 2017/18, besides parental leave other inactive employment contracts were also included. The change versus previous years is due to our inclusion of parental leave exclusively since FY 2017/18 also for the Americas region.

Employment Length	Average Employment Length by Region in years	FY 2018/19	FY 2017/18	FY 2016/17
	Voith Group	12.88	12.61	12.39
	Germany	16.55	16.12	16.19
	Europe excluding Germany	12.46	12.62	12.41
	Americas	10.83	10.73	10.35
	Asia	8.08	7.57	7.27
	Other	8.30	8.31	8.33
	New Employee Hires Who Left Voith within Twelve Months by Gender, Age Group, and Region Number			
	Voith Group	356	356	305
	Women	87	73	57
	Men	269	283	248
	< 30 years	154	144	120
	30–50 years	160	153	147
	> 50 years	42	59	38
	Germany	83	83	36
	Europe excluding Germany	59	26	36
	Americas	140	161	165
	Asia	68	73	61
	Other	6	13	7

Employee Turnover

Employees Who Left the Company by Gender, Age Group, and Region (Workforce Fluctuation) Number

	FY 2018/19	FY 2017/18	FY 2016/17
Voith Group	1,884	1,983	2,127
Women	373	341	324
Men	1,511	1,642	1,803
< 30 years	399	433	454
30–50 years	881	981	1,051
> 50 years	604	569	622
Germany	366	359	393
Europe excluding Germany	318	268	250
Americas	855	979	1,079
Asia	298	309	328
Other	47	68	77

Employees Who Left the Company by Gender, Age Group, and Region (Workforce Fluctuation) in %

Voith Group	9.9	10.3	11.0
Women	10.7	9.8	9.5
Men	9.8	10.4	11.4
< 30 years	16.8	17.4	17.7
30–50 years	8.5	9.3	9.7
> 50 years	9.7	9.3	10.5
Germany	4.6	4.6	5.2
Europe excluding Germany	11.1	9.3	8.6
Americas	21.2	21.8	22.4
Asia	8.8	9.3	10.0
Other	6.5	9.7	11.3

Employees who Left the Company on Own Initiative in %

Voith Group	9.9	10.3	11.0
At the employee's initiative	3.9	4.3	3.7
At the employer's initiative	4.9	5.1	6.3
Other	1.1	1.0	1.1

3.3 Attracting and Promoting Talent

New Hirings	New Employee Hires by Gender, Age Group, and Region Number	FY 2018/19	FY 2017/18	FY 2016/17
	Voith Group	1,839	2,151	1,603
	Women	381	408	283
	Men	1,458	1,743	1,320
	< 30 years	751	918	537
	30–50 years	857	970	813
	> 50 years	231	263	253
	Germany	430	675	283
	Europe excluding Germany	286	264	174
	Americas	713	704	758
	Asia	310	409	324
	Other	100	99	64
	New Employee Hires by Gender, Age Group, and Region in %			
	Voith Group	9.3	11.3	8.3
	Women	10.5	11.7	8.3
	Men	9.0	11.2	8.3
	< 30 years	29.5	37.7	21.3
	30–50 years	7.8	9.3	7.6
	> 50 years	3.7	4.3	4.2
	Germany	5.3	8.5	3.7
	Europe excluding Germany	9.8	9.2	6.0
	Americas	18.0	17.0	16.0
	Asia	9.1	12.1	9.9
	Other	6.9	14.0	9.3
Apprenticeships and Opportunities	Vocational Training Number			
	Apprentices and students at cooperative universities	838	801	959
	in Germany	534	519	599
	at our Heidenheim location	326	302	360

Training and Education and Career Development	Training and Education Expenditure Number	FY 2018/19	FY 2017/18	FY 2016/17
	Training and Further Education Hours	243,304	266,959	320,324
	Women	50,872	52,261	63,150
	Men	192,432	214,697	257,174
	< 30 years	43,014	36,769	48,296
	30–50 years	153,326	164,251	206,913
	> 50 years	46,964	65,939	65,115
	The Corporate Board of Management, Executive Team, Senior Management Circle; Regional Directors/Chairpersons, Board of Management of operating units, heads of product groups, managers in Group management functions.	11,130	14,467	14,335
	Mid- and lower-level management	17,751	19,893	34,107
	All other employees	214,423	232,599	271,882
	Hours of Further Education by Employee Number			
	Voith Group	12.3	14.0	16.6
	Women	14.0	15.0	18.5
	Men	11.9	13.8	16.2
	< 30 years	16.9	15.1	19.7
	30–50 years	14.0	15.7	20.3
	> 50 years	7.4	10.7	11.5
	The Corporate Board of Management, Executive Team, Senior Management Circle; Regional Directors/Chairpersons, Board of Management of operating units, heads of product groups, managers in Group management functions.	24.9	31.5	31.8
	Mid- and lower-level management	26.5	28.9	47.7
	All other employees	12.1	12.9	15.0
	Number of Employees Who Underwent Further Training Number			
	Voith Group	15,930	16,594	15,645
	Total Expenditure in €			
	Voith Group	2,964,779	3,680,130	5,723,508
	Employees Who Received Performance and Career Development Reviews in %			
	Voith Group	92.1	91.4	82.7
	Women	90.4	88.8	83.1
	Men	92.6	92.0	82.6
	The Corporate Board of Management, Executive Team, Senior Management Circle; Regional Directors/Chairpersons, Board of Management of operating units, heads of product groups, managers in Group management functions.	87.6	86.3	84.5
	Mid- and lower-level management	94.9	93.9	87.7
	All other employees	92.2	91.4	82.4

3.4 Occupational Health and Safety

Approach to Preventing or Dealing with Negative Health and Safety Impacts

Regarding our own locations, construction sites, and products, Voith's approach to preventing negative health and safety impacts is as follows:

1. At our own locations, we employ the occupational health and safety system outlined on an ongoing basis. We are progressively expanding this proven system of regional support to continuously improve its quality and effectiveness.
2. At our construction sites and during on-site activities with our customers, we perform risk assessments in advance. These are updated on a regular basis and involve a careful examination of many aspects, including how the various industrial technicians are coordinated in relation to safety aspects.
3. For our products and their use, we focus right from the product development stage on achieving strict compliance with regulatory requirements. In addition, our products undergo a range of test and inspection stages. We incorporate the findings from these processes, together with information from market and product monitoring, systematically into the development and enhancement of our products.

To identify and analyze work-related hazards and risks in connection with occupational safety, we have implemented a comprehensive audit system in addition to our overarching risk management process. In the reporting period we identified heavy-load handling and crane operation as the greatest HSE risks.

Employee Representation in Committees

Total Number of Employees¹⁾ Represented on Health and Safety Management Worker Committees in %

FY 2018/19

FY 2017/18

FY 2016/17

Voith Group

80

80

75

Occupational Accidents

Occupational accidents – employees Number

Total occupational accidents

54

52

50

of which fatal

0

2

0

of which severe

3

5

n. r.

Note: Data on all accidents subject to compulsory reporting were gathered. One occupational accident led to an employee being unfit for work over the transition from FY 2016/17 to FY 2017/18. The accident was included in reporting for FY 2017/18.

Frequency Rates – employees Number

Definition/Explanation: Number of occupational accidents resulting in downtime (1 day or more) per 1 million working hours.

Occupational accidents per million hours worked

1.5

1.5

1.4

of which fatal

0

0.06

0

of which severe

0.08

0.14

n. r.

¹⁾Based on headcount.

Occupational Accidents

Occupational Accidents – personnel working for Voith but who are not Voith employees Number

	FY 2018/19	FY 2017/18	FY 2016/17
Occupational accidents	46	48	n.r.

Note: Since October 2017 Voith has gathered third-party occupational accident data centrally. Each incident is documented in an Incident Report and followed up. For these incidents Voith's Reporting Organization does not currently distinguish between degrees of accident severity, or working hours lost. Due to the differing data-gathering methods these values are not comparable with the data provided on Voith's own employees.

Occupational Accidents by Region Number

Voith Group	54	52	50
Germany	33	31	37
Europe excluding Germany	6	9	6
Americas	8	9	7
Asia	5	3	0
Other	2	0	0

Severity Rate

Definition / Explanation: Hours lost per 1 million working hours.

Voith Group	364.4	342.2	271.2
Germany	343.6	303.4	306.3
Europe excluding Germany	121.9	535.5	217.0
Americas	323.5	286.3	159.5
Asia	554.4	364.7	391.9
Other	397.1	0.0	0.0

Absence Rate in %

Definition / Explanation: Refers to the actual days of employee absence, expressed as a percentage of the overall scheduled working days for the workforce over the same period.

Voith Group	2.5	2.6	2.5
Germany	3.9	3.7	3.8
Europe excluding Germany	3.5	3.4	3.2
Americas	1.5	1.7	1.6
Asia	0.9	1.0	1.1
Other	1.5	1.2	1.2

Occupational Accidents	Lost Day Rate in %	FY 2018/19	FY 2017/18	FY 2016/17
	Definition / Explanation			
	LDR: The impact of occupational accidents, which can be measured against the time the affected employee failed to appear for work. The rate is calculated by comparing the total number of lost days with the total number of hours which the workforce ought to have worked in the reporting period.			
	Working Days Lost: Working days which could not be worked on (and so are "lost") as one or more employees was / were unable to perform his / her / their usual work owing to an occupational accident. These days do not count as working days lost if an employee returns for a limited number of hours or for a different activity.			
	Voith Group	8.8	8.4	7.7
	Germany	9.2	8.1	8.2
	Europe excluding Germany	3.0	13.4	5.4
	Americas	7.5	6.7	3.7
	Asia	12.5	8.2	8.8
	Other	9.0	0.0	0.0
Occupational Safety Training	Training Courses in Occupational Safety in %			
	Operations managers	~ 100	~ 100	~ 100
	Administrative managers	80	80	80
	Trained service providers	n. r.	n. r.	n. r.

4. Products and Supply Chain

4.1 Product Responsibility

4.1.1 Management

Research & Development Expenditure	Research & Development in € millions	FY 2018/19	FY 2017/18 ¹⁾	FY 2016/17
	R&D Expenditure	213	222	217
	Percentage of Revenues Dedicated to R&D in %	5.0	5.3	5.1
Nanotechnology	<ul style="list-style-type: none"> • Voith Paper: Calender and roll covers in the area of finishings. The NanoPearl coatings represent the latest in calender-cover technology thanks to an improved nanoparticle filler system. According to the manufacturer's statement, the quartz particles are produced in situ with the resin and are not released at any stage of the manufacturing process. When rubbed during use, the particles are still surrounded by plastic and thus pose no hazard. No particles are released in thermal disposal either. • Voith Turbo: Cooling systems for locomotives, railcars, special vehicles, and high-speed trains. The particular coating process is performed by a service provider, and currently less than 10 kg of material is in field use. • Voith Hydro uses no nanoparticles, either in manufacturing processes or in the products themselves. 			
Approach to Handling Suspect and Hazardous Materials	<p>All Voith Group Divisions comply with the relevant rules and regulations for the handling and exclusion of suspect and hazardous materials.</p> <p>For Voith Hydro, EU Directives are especially relevant, such as the REACH regulation. The centrally managed Group Standardization Department is responsible for implementation of and compliance with the guidelines. During modernization projects, there may be individual cases of old machines containing asbestos. All applicable rules and regulations are complied with when handling them; specialized companies are commissioned for their proper disposal.</p> <p>The REACH regulation applies to Voith Paper as well. All free chemical substances included in the REACH list are categorically excluded. When new substances are added to the list, Voith Paper reviews their use and, where necessary, identifies a harmless substitute which is then tested and introduced.</p> <p>For Voith Turbo products, the regulations for the handling and categorical exclusion of suspicious and hazardous materials are numerous. For example, EU regulations such as the REACH regulation, the RoHS directives and German Battery Law (BattG) apply. In addition, there are railway fire protection standards, the Group's own specifications on hazardous materials, specific customer requirements, and guidelines from associations such as the Rail Industry Substance List and the globally standardized IMDC exchange and management system for material data in the automotive industry. Hazardous materials are avoided or replaced by other materials as early as the engineering phase, wherever technically and economically feasible.</p>			

¹⁾ 2017/18 figures have been adjusted.

4.1.2 Reliable and Safe Products

4.1.3 Product Responsibility by Group Division		Large Hydro	Small Hydro	HyService	Automation (with digital products)
Impact of individual Voith Hydro product groups on specific sustainability criteria					
Further Information on Social and Environmental Impacts – Voith Hydro	Energy efficiency	very high	very high	medium	low
	GHG emissions	high	high	medium	low
	Material efficiency	–	–	–	–
	Long service life	very high	very high	very high	high
	Recyclability	high	high	high	high
	Upgradability / retrofitting	low	medium	high	high
	Reparability	very high	very high	very high	very high
	Safety	very high	very high	very high	very high
Selection: Technologies for Mitigating Social and Environmental Impacts at Voith Hydro					
Technology		Sustainability impacts		Area of application (product group)	
Cavitation Erosion Detection: Enables statements on the intensity of material removal and/or damage to affected components, depending on their operating condition, as well as the creation of condition-based analysis reports and the derivation of recommendations for action.		<ul style="list-style-type: none"> • Improved reparability • Improved upgradability/retrofitting • Improved service life 		Condition Monitoring System/HyService	
Optimized design of fish passages: Increased permeability of turbines for fish, for example salmon in the USA and eels in Europe.		<ul style="list-style-type: none"> • Reduction of negative effects on the maritime ecosystem 		Large Hydro	
StreamDiver: Enables the installation of new hydropower plants under strict environmental conditions at existing dams, locks, and irrigation dams. This enables the utilization of energy potential that cannot be tapped with conventional power plant concepts.		<ul style="list-style-type: none"> • Improved energy efficiency 		Small Hydro	

Further Information on Social and Environmental Impacts
– Voith Hydro

Further Information on the Energy Efficiency and Climate Footprint of Voith Hydro Products

The Voith Hydro product portfolio is clearly oriented towards sustainability. On the path towards climate neutrality, we are continuously working on bringing products with an ever-smaller CO₂ footprint to market. To this end, Voith Hydro has set itself the goal of constantly improving the efficiency – and therefore the energy efficiency and carbon footprint – of its products. In the product development of all Hydro products, we are constantly working to optimize efficiency. One example of this is the innovative turbine controller at the small hydro plant in Storr Lochs, Scotland. A compact drive from Voith Turbo has been in operation here since 2017, which was first used in a modified form in a hydro power station. The hydraulic regulation of the turbine controller offers advantages in several respects: On the one hand, the new technology has increased the energy efficiency of the plant. On the other, the new controller does not require an additional pressure accumulator and operates with a very small oil volume, thus reducing environmental impact due to oil losses while increasing plant safety.

Approach to Noise Emissions and Pollution at Voith Hydro

At Voith Hydro, noise emission targets are set on a project basis in the calls for tender. Specifically with regard to noise emissions, Voith Hydro pursues the ongoing goal of predicting noise emissions increasingly accurately, and defining necessary measures in advance. In the reporting year, the corresponding noise reduction measures were initiated and lab-tested.

Furthermore, project-specific KPIs are set to allow noise emissions to be controlled efficiently. Voith's OnCare.Acoustic smart technology is also used here: This enables the detection of fluctuations in turbine noise emissions so that appropriate measures can be taken.

Further Information on Product Safety at Voith Hydro

At Voith Hydro, all products must at least meet the safety and health requirements of the relevant EU directives, irrespective of the market area. The construction rules for all Voith Hydro components and products are defined in corresponding design manuals. Safety tests are always carried out both during the manufacturing process as well as during installation and commissioning. For all components and products, a corresponding Inspection and Test Plan defines the specific test criteria, responsibilities, and documentation requirements.

Voith Hydro continues to monitor its products during the utilization phase with regard to potential safety risks and major machine damage. We always adhere to product liability law and its specifications regarding the active product monitoring obligation. In case of a safety risk or safety-relevant event, Voith Hydro informs customers immediately as a matter of course and always in accordance with legal requirements.

To ensure our customers enjoy a maximum level of safety, all safety information on Voith Hydro products is also documented in the operating manual. In addition, Voith Hydro offers customers the following safety training courses through the Voith HydroSchool:

- Safety-by-design Principles and Case Studies: In this one-day seminar we train customers on the fundamental safety requirements of hydropower plants and discuss combined case studies on damage and accidents.
- Application and Fulfillment of EU Directives on Machine and Plant Safety: In this seminar, we share our expertise and provide practical examples to prepare our customers for the complex process of CE marking.
- Training programs tailored for individual customers that can be repeated regularly.
- Mentoring and train-the-trainer programs for sustainable knowledge building at the customer site.

4.1.3 Product Responsibility by Group Division

Impact of individual Voith Paper Product Groups on Specific Sustainability Criteria

	Projects	Products & Services	Rolls and covers	
Further Information on Social and Environmental Impacts – Voith Paper	Energy efficiency	medium	high	medium
	GHG emissions	medium	medium	medium
	Material efficiency	medium	medium	high
	Long service life	high	high	high
	Recyclability	medium	medium	low
	Upgradability / retrofitting	high	high	medium
	Reparability	medium	high	medium
	Safety	high	very high	high

Selection: Technologies for Mitigating Social and Environmental Impact

Technology

Sustainability impacts

Area of application (product group)

Holistic asset management system for screen baskets: RFID-based lifecycle tracking tool enables identification of wearing parts effectively and reliably, thus improving maintenance targeting and reparability.

- Improved reparability
- Improved upgradability / retrofitting
- Improved service life

Products & Services

BioBased Yarn: Currently in development phase; will enable the use of renewable materials as replacement for petroleum-based ones for wearing parts for covers, roll covers and shoe press sleeves.

- Improved climate footprint

Rollers and covers

HydroSeal components: Enable water savings of more than 27.5 million m³ per year compared with standard technologies, as well as significant energy savings.

- Improved energy efficiency
- Improved resource and material efficiency

Rollers and covers

Green Pulping Technology: Currently in the development phase; will enable more energy-efficient pulping systems for recycled paper.

- Improved energy efficiency
- Improved climate footprint

Projects

ProLube/FilmLube: Fresh water consumption through lubrication spray pipes is greatly reduced; the moisture cross-profile of the wet felts is significantly more uniform. This improves the useful life of press felts by up to 30 %.

- Improved reparability
- Improved service life

Rollers and covers

Smart-Loop-Technology for water treatment: Cooperation project with Voith subsidiary meri Environmental Solutions; enables improved cleaning of wastewater from paper factories.

- Improved environmental compatibility
- Improved resource and material efficiency

Projects

4.1.3 Product Responsibility by Group Division

Impact of individual Voith Turbo product groups on specific sustainability criteria

	Mobility	Industry
Further information on Social and Environmental Impacts – Voith Turbo	Energy consumption	high
	GHG emissions	very high
	Long service life	high
	Recyclability	high
	Upgradability / retrofitting	medium
	Reparability	high
	Safety	very high

Selection: Technologies for improved social and environmental impact

Technology

Sustainability impacts

Area of application (product group)

AeroMaxx: By using new types of bearings and separating the lubricating fluid from the cooling oil, energy losses and oil requirements of gearboxes with power generation systems can be reduced by up to 30 %.

- Improved energy efficiency
- Improved climate footprint
- Improved material efficiency
- Improved environmental compatibility

VT Industry

Railroad diesel engines: A joint project with the Liebherr Group, in the development phase. These meet the latest emissions standards, offer 23 % more power in the same installation space, and deliver fuel savings of around 8 % versus the competition.

- Improved energy efficiency
- Improved climate footprint
- Reduced pollutant emission

VT Mobility

BeltGenius: Digital system for simulating entire conveying systems in the mining sector. Enables the monitoring, comparison and optimization of belt conveyors and conveying systems; results in reduction in plant downtimes and energy savings of up to 10 %.

- Improved energy efficiency
- Improved climate footprint
- Improved maintenance and reparability

VT Industry

DIWA NXT: Transmissions for city buses, in development. Enables fuel savings of 7 % (mechanical optimization) and an additional 9 % due to the optional mild-hybrid system (recuperation unit). Overall, this achieves 16 % reduction in consumption compared to the previous transmission generation.

- Improved energy efficiency
- Improved climate footprint
- Improved passenger comfort

VT Mobility

Pilotfish-Systeme: Cloud-based analysis process including hardware components for reducing fuel consumption and wear. Enable optimized fleet management for reduced vehicle deployment, improved vehicle availability, and early damage detection.

- Improved energy efficiency
- Improved climate footprint
- Improved maintenance and reparability

VT Mobility

Further information on Social and Environmental Impacts – Voith Turbo

Further Information on the Energy Efficiency and Climate Footprint of Voith Turbo Products

To achieve this, work is carried out in all phases of the product development process (from developing ideas, through the definition, feasibility and development phase, to the validation phase) to improve the energy efficiency and climate footprint of products. The Voith Turbo guideline on sustainability defines the procedure for developing sustainable products and comprises three stages: Green Design, EcoDesign, and Sustainable Design.

Further Information on the Resource Efficiency of Voith Turbo Products

Voith Turbo constantly works on optimizing the material efficiency of its products, meeting specific customer requirements for product sustainability, and of course, on constantly complying with all regulatory requirements, such as the REACH regulation.

The largest material fractions at Voith Turbo are cast aluminum, steel, and cast iron. Currently, we are working on improving material efficiency in all of these fractions.

Within the scope of product development, we work continually to improve the material efficiency of products, above all by integrating modularization and value analysis experts. Key levers for improved material efficiency are modularization and standardization work on the one hand, and measures within the framework of the Design to Cost and Design to Value development approaches on the other. For example, the increased use of common parts leads to a reduction in the number of production tools and machines required, as well as to less scrap, material wastage and less inventory.

As part of our Voith Turbo Engineering Excellence project we are currently investing a great deal of effort in the topic of material costs, and thus also in cutting the quantities we use. In addition, we are measuring and optimizing waste volumes by reducing the use of materials where these are not required for product functionality.

Approach to Lowering Noise Emissions at Voith Turbo

Voith Turbo also works continuously to reduce its products' noise emissions. To this end, Turbo aims for constant compliance with the technical specification for interoperability (TSI) relating to the subsystem 'rolling stock – noise' (TSI Noise) established under EU Regulation 1304/2014, as well as DIN EN ISO 3095 ("Acoustics – Railway applications – Measurement of noise emitted by railbound vehicles").

Other noise emission standards such as ISO/TR 11688-1/2 are also met. Examples are the Silent Vent fan wheel or the bionic gearing of final drives in the field of drive technology. Bionic toothing was developed to minimize material costs and noise emissions in gear drives, and is already in mass production and in use in rail-vehicle gear units. It enables a reduction in noise emissions by up to 3 dB(A).

An example of this is a new railcar transmission test stand that allows Voith Turbo to conduct detailed noise measurements, advancing the optimization of railcar-transmission noise emissions. An approach to reducing the noise generated by railcar transmissions was also developed.

4.2 Responsibility in the Supply Chain

Procurement Markets	Procurement Markets in %	FY 2018/19	FY 2017/18	FY 2016/17
	Europe	56	56	56
	Americas	22	27	23
	Asia	21	16	20
	Other	1	1	1
Approach to Suspicious, Hazardous and Conflict Materials in the Supply Chain	The handling of suspicious, hazardous and conflict materials is regulated in a clear and binding way for suppliers in the GPCs (see chapters 13.2 and 13.3).			
Country-specific GPCs	Country-specific GPCs in %			
	Country-specific GPCs	33	29	26
	of which new	4	3	5
	of which updated	1	none	all
Scope of Training	Training of Purchasing Employees Globally Number			
	Purchasing employees	~ 500	~ 500	528
	Purchasing employees trained	almost all	almost all	528
	Hours of training of Purchasing employees (Purchasing Training Program)	1,850	1,514	3,629
	Hours of training of Purchasing employees	9,397	10,832	12,022
Supplier Self Assessment	Suppliers Who Have Filled Out a Self-assessment Number	FY 2018/19	FY 2017/18¹⁾	FY 2016/17
	Compliance & Sustainability Check of initial self-assessment	3,659	3,584	2,547
	Initial self-assessment	n. d.	n. d.	n. d.
	Share of the invoice volume obtained from suppliers for whom there is a valid Compliance & Sustainability Check of the initial self-assessment in %	66.0	68.0	55.0
	Supplier self-assessment ratio (share of the invoice volume obtained from suppliers for whom there is a valid self-assessment) in %	n. d.	n. d.	n. d.

¹⁾ Owing to the system migration, in FY 2016/17 no new assessments were able to be gathered for 6 months. In addition, questions regarding compliance and sustainability were removed from the initial Supplier Self-assessment and incorporated into a Compliance & Sustainability Check which can now be requested from and confirmed by suppliers as an individual questionnaire.

Evaluation of Suppliers

Examples of how supplier evaluations are carried out in the Group Divisions are the processes implemented at Voith Hydro and Voith Turbo.

Voith Turbo implemented a multi-step process for the risk assessment of suppliers. In addition to basic risk categories such as creditworthiness, quality and delivery reliability, competitiveness, and customer structure, the second stage of the process also encompasses additional risks such as geographical location, geographical and political risk, and interruptions to supply systems.

Voith Turbo uses the VDA 6.3 Process Audit standard for Supplier Assessments and Supplier Audits. Among other things, it also contains questions about occupational safety and environmental protection: These determine whether the supplier has implemented a system for occupational safety and environmental protection and whether there is a system in place for implementing the material compliance requirements (EG 1907/2006 REACH, or Directive 2011 / 65 / EU ROHS for electronics suppliers).

Voith Hydro intensively checks suppliers for compliance and quality over the entire lifecycle. Prior to inclusion in the supplier database, suppliers are assessed for integrity (including compliance and HSE criteria), financial stability, and implemented quality systems, as well as experience of and references from working with other suppliers. Supplementary on-site audits are carried out on suppliers of key power plant components and services; these audits are carried out jointly by Quality Assurance and the Supplier Development & Support function within Purchasing. To secure the highest quality assurance, Quality Management always has the last decision in the release process via a veto right.

Efficient transport logistics: In order to be able to make even more precise statements about transport-related CO₂ emissions and the distribution of transport modes by tonne-kilometres in the future, Voith decided to develop new calculation bases in cooperation with its external service providers and partners. By the end of the 2020/21 financial year we would like to present the respective results.

Supplier Evaluations Number	FY 2018/19	FY 2017/18²⁾	FY 2016/17¹⁾
Evaluations (individual processes)	1,200	1,115	710
Suppliers evaluated	1,000	916	566
Suppliers audited	n. d.	n. d.	n. d.
Sustainability ratio in %	82.8	87.4	89.7
Supplier evaluation ratio (% of invoice volume by evaluated suppliers)	29.0	49.0	36.0
Invoice volume with suppliers with a current and approved supplier evaluation (Invoice volume in € millions)	n. d.	928	705

Supplier Compliance

Supplier Compliance Number	FY 2018/19	FY 2017/18	FY 2016/17
Blocked suppliers	13	13	13

Only includes blocks due to violations of compliance and/or sustainability guidelines; excludes blocks owing to bankruptcy or technical quality issues.

¹⁾ Owing to the system migration, in FY 2016/17 no new assessments were able to be gathered for 6 months. In addition, questions regarding compliance and sustainability were removed from the initial Supplier Self-assessment and incorporated into a Compliance & Sustainability Check which can now be requested from and confirmed by suppliers as an individual questionnaire.

²⁾ Data status as at November 2018

The Report

Voith has published a Sustainability Report every year since 2009. This report describes the progress we made in terms of our sustainability in Voith's 2018/19 fiscal year, i.e. from October 1, 2018 to September 30, 2019.

In producing our report we followed the internationally recognized guidelines of the Global Reporting Initiative (GRI). The scope of our report fulfills the requirements of the Core option of the GRI Standards. Our report was not audited externally. In 2018 we carried out an exhaustive stakeholder survey to identify the material sustainability issues and enhance our materiality analysis; this report includes the results.

Unless stated otherwise, the facts, figures and information provided in this report apply globally to the following Voith Group Divisions: Voith Hydro, Voith Paper, Voith Turbo, and Voith Digital Ventures. Please refer to the Voith Annual Report for details of the Group companies covered. The degree of consolidation comprises at least 80% of the Voith Group by revenue and headcount, and includes all of our Group's major locations. While we provide the number of employees in this report in terms of headcount, in our Annual Report we give this figure mainly in terms of FTEs (full-time equivalents); this may lead to discrepancies between the figures.

The data gathered for the core figures provided in this report was gathered using mainly division-specific software. Figures were rounded off to support reporting

clarity, which may cause discrepancies between the individual totals given in the relevant tables and final Group-wide totals. In individual cases it is not yet possible to derive a three-year trend; however, this is our objective for future reports. In a few cases, certain key figures already reported relating to previous periods have been retrospectively updated due to a change in the underlying data basis or calculation methodology. We have indicated this in the report at the corresponding points.

All forward-looking statements in this report are based on reasonable assumptions as at the deadline for report content submission. Due to unknown risks, uncertainties and other factors, the actual results, developments or performance of our company may deviate from our forecasts, estimations, and statements.

For further information please see our Annual Report. For optimal readability we refrain from making dual gender-specific references in this report. This is not a value judgment, and all such references are to be understood as fully gender-neutral.

Further information is provided at www.voith.com and in our Annual Report. We currently expect to publish our next Sustainability Report in early 2021.

 [Annual Report 2018/2019](#)

Imprint and Contacts

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Further Information

The Sustainability Report is also available in German.

The German and English editions are available online at:

<http://voith.com/corp-de/ueber-voith/nachhaltigkeit.html>

<http://voith.com/corp-en/about-us/sustainability.html>

In addition to the Sustainability Report, Voith also publishes a comprehensive Annual Report at the end of the fiscal year.

It is available online at:

www.voith.com

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