ACTING NOW.

FOR NEXT GENERATION MOBILITY

ANNUAL REPORT
2022

Key Figures

€43,801 million

Sales

74%

Cars and light commercial vehicles <6t

€3,425 million

Expenditure on research and development

17%

Commercial vehicles >6t

164.869

Employees

9%

Construction and agricultural machinery, rail drives, marine craft, aircraft and wind power

	2022	2021
Sales	**€43,801 million**	**€38,313 million**
Adjusted EBIT Adjusted EBIT margin	**€2,038 million** 4.7%	**€1,910 million** 5.0%
Net profit or loss before tax in % of sales	**€562 million** 1.3%	**€1,082 million** 2.8%
Net profit or loss after tax	**€376 million**	**€783 million**
Adjusted free cash flow[1]	**€544 million**	**€991 million**
Investment in property, plant and equipment	**€1,888 million**	**€1,605 million**
Equity ratio (Dec. 31)	**22.1%**	**18.6%**
Employees[2]	**164,869**	**157,549**

1) Cash flow from operating activities less cash flow from investing activities, adjusted for M&A activities and securities.
2) Direct and indirect employees without temporary workers, apprentices and vacation workers (as of Dec. 31).

Sales Development by Region

- 43% Europe
- 29% North America
- 24% Asia-Pacific
- 3% South America
- 1% Africa

Company Profile

ZF develops and produces technologies for the mobility of the future.

ZF is a global technology company. We supply mobility systems for passenger cars, commercial vehicles and industrial technology. In the four technology domains of Vehicle Motion Control, Integrated Safety, Automated Driving and Electric Mobility, ZF offers comprehensive product and software solutions for established vehicle manufacturers and newly emerging transport and mobility service providers.

Digitalization will continue to strongly influence the mobility sector. The paradigm shift caused by software will also change ZF. Therefore, digital networking and automation are key areas of system development at ZF on its path to become a software- and cloud-based company. ZF allows vehicles to see, think and act.

We see climate change as one of the greatest challenges of our time. To provide clean and sustainable mobility, which is also comfortable, safe and affordable, we develop innovative products for Next Generation Mobility. Accordingly, we invest a significant share of our sales in research and development – last year almost eight percent. The ZF Group is represented with 168 production locations in 32 countries. With some 164,900 employees worldwide, ZF reported sales of €43.8 billion in fiscal year 2022.

We are in the midst of transformation. The mobility of the future is also no longer just a vision for ZF. In fact, there are numerous products and services that are already available today.

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Acting now.

ZF recognized current and future challenges early on and positioned the Group to address them. The guiding principles are in place. The next logical steps are operationalization and industrialization. And this is happening right now – at increasing speed.

01

Acting now.

How the Group is gaining momentum on all levels

In 2022, ZF made a commitment to climate protection and nature conservation, people and lasting values under one common motto: Acting now. ZF is driving forward its own transformation and the transformation of its products and technologies with the same momentum. It is about acting now – so we can lead the competitive field for Next Generation Mobility. The political and economic crises we now face make it more imperative than ever to act, giving the transformation the momentum it needs.

What does this mean in practice? When it comes to electric mobility, software, Vehicle Motion Control and autonomous driving, ZF is picking up the pace. With volume-production solutions such as highly efficient electric motors that almost do not need rare earths at all. With a consistent focus on core technologies for the software-defined vehicle and new electric-electronic architectures (E/E). And with self-driving shuttles that make inner-city traffic clean and safer. These are just three examples of the many market-ready technologies that ZF uses to increase efficiency and sustainability.

This shows that ZF is excellently prepared to meet current and future challenges. In the next step, we must focus on the large-scale production of these new technologies.

"We drive change even faster"

ZF's new CEO, Dr. Holger Klein, talks about the Group's current situation and the priorities he wants to set.

For ZF's new CEO, sustainable corporate development is essential.

Motivated and international team: ZF has approximately 164,900 employees worldwide.

Dr. Klein, you have taken up your position in a difficult time: The war in Ukraine, increased energy and raw material costs, inflation and uncertain supply chains are fueling fears of a recession. Despite all this – why are you optimistic?

If we include 2019 in our calculations, when the automotive market shrunk noticeably, we are now in the fifth year of crisis – after two pandemic years and the war year of 2022. The challenges for ZF were and are still enormous. But – as in the past few years – we are responding to them professionally and with great commitment and we are doing our homework. This means we have given ourselves clear priorities for this year which provide orientation for all employees. That's why, and because we have a highly motivated ZF team, I am confident.

What does that mean specifically?

Our main task this year is to achieve our financial targets to secure ZF's financial independence. Then, we have to master all product ramp-ups flawlessly and on time, and consistently review our technology portfolio, focusing on those projects that ensure sustainable income. Firmly anchored in our strategy is that ZF is to become more sustainable and more digital – that is the fourth priority for 2023, and no company will remain successful without this focus. The fifth priority, which is more the basis of our actions, is our ZF Way, that we all fill

Optimistic despite the difficult environment: Dr. Holger Klein has been the new Chief Executive Officer of the ZF Group since January 2023.

The Next Generation Mobility strategy is still the right path. However, the speed of change will continue to increase.

"We will speed up our processes and simplify decision-making channels in the company."

with life. Only with the principles of the ZF Way will we be able to translate our priorities and take along everyone in the ZF team.

What about the strategy?

ZF has the right strategy, but we are setting a clearer focus and speeding up our transformation as well. We want to adapt our corporate structures even more to market and customer requirements. For example, after merging two divisions into the Electrified Powertrain Technology Division, we will combine the Car Chassis Technology and the Active Safety Systems divisions to form a new division. It will be unique worldwide, because there is no competitor that can offer chassis, steering and braking technology from a single source. We also want to become more attractive to external investors, which is why we are carving out our conventional passenger car axles business, the Passive Safety Systems Division and our shuttle business.

What do you want to focus on?

For me, sustainable corporate development is essential. ZF has committed itself to become fully climate-neutral by 2040. Ten years earlier, at the end of this decade, we aim to have cut our emissions by 80 percent compared to 2019! That's why, for the first time this year, we have included criteria of Environmental Social Governance (ESG) in the remuneration strategy of our top management. We are also advancing digitalization in the company, because it creates efficiencies and transparency. It can enable ZF to develop products for software-defined vehicles and transfer all its processes in development, production and administration to the cloud.

What is ZF expecting in 2023?

A consistent performance program has been initiated to secure ZF's continued financial independence in the future, while at the same time investing specifically in new technologies. We will speed up processes, simplify decision-making channels in the company — and above all, pay attention to strict cost management discipline. The efficiency this brings allows us to make new investments.

ZF is in a good overall position: After all, we now cover more markets, segments and technologies than ever before. Our products are excellently received by our customers. In 2022, we therefore recorded the highest order intake in our history. ZF is consistently pursuing this path and adapting to new circumstances. This has been proven by the just recently decided partnership with Wolfspeed for the development of silicon carbide semiconductors. This technology is central to the mobility of the future and, as a result, vital for the successful development of our company.

02

Sustainability

Sustainability is an integral part of the ZF corporate strategy. Targets include full climate neutrality by 2040. However, ZF sees sustainability as more than just climate protection. Besides climate and nature conservation, the focus is also on the aspects of people and lasting values.

750 employees from various disciplines in several ZF divisions work in the Technical Center for Developers and in the office complex next door.

ZF new building: An object lesson in sustainability

ZF engineers significantly improve the eco-balance of their location.

After more than 60 years, the ZF Hub in Solihull (UK) moved to a new building. The new workplace for 750 ZF employees pursues the ambitious goal of shifting the energy consumption of the ZF research and development location toward net zero.

Care was taken during the planning stage to ensure that the new building consumes as little energy as possible once complete. But when the architects' initial plans were presented, the ZF engineers wanted something more ambitious: "We can do more here" was the motto – and numerous in-house solutions enriched the planning.

The results are compelling: A new standard for sustainable construction and the transition to climate-neutral operation were implemented.

If the old location only achieved an "F" in the Energy Performance Certificate (EPC) rating, the new building's "A" rating stands out. The numbers also add up from a financial perspective, thanks to 75 percent less gas and 20 percent less electricity consumption than the previous building. The building opened its doors in November 2021. In the first year of operation alone, approximately 2,500 megawatt hours of energy were saved compared to the previous location.

More about the ZF Solihull (UK) location

Top: Employees from the ZF plant in Coimbatore have already built more than 5,000 wooden nest boxes to conserve biodiversity.

Bottom: Mixed woodland and irrigation pond instead of barren soil: The ZF Go Green Team's achievements are clear to see.

ZF employees in India set up Go Green Team

Green oasis and relief projects as the team's remit

Torrential monsoon rains in November 2015, with devastating consequences for the southernmost Indian state of Tamil Nadu, provided the impetus: 25 employees from the ZF plant in Coimbatore, 500 kilometers away, spontaneously decided to help the victims of the flood disaster.

The sense of community forged by providing assistance paved the way for other initiatives aimed at improving the environment. Today, 156 members of the ZF Go Green Team – together with their family members – support campaigns aimed at helping nature conservation and social causes.

Whether its energy-saving measures through LED lamps, composting equipment or the introduction of a reusable transport system instead of traditional wooden crates, the Go Green Team already has countless successful projects to its name.

One highlight is the Mini Forest Project that involved planting 9,200 trees on the factory site. Mixed woodland including irrigation pond was created in the arid area. Today, the site is home to more than 40 bird species.

Learn more about the Go Green Team

Occupational safety and health improved significantly

Communication initiative strengthens occupational safety and health

The development is positive: ZF has been able to reduce the rate of industrial accidents by more than half since 2016. However, this trend slowed down during the second pandemic year. ZF responded immediately and an analysis showed that less personal contact in the workshop halls was a decisive cause. The ENGAGEtobeSAFE initiative developed as a consequence strengthens the staff's attention to this important topic.

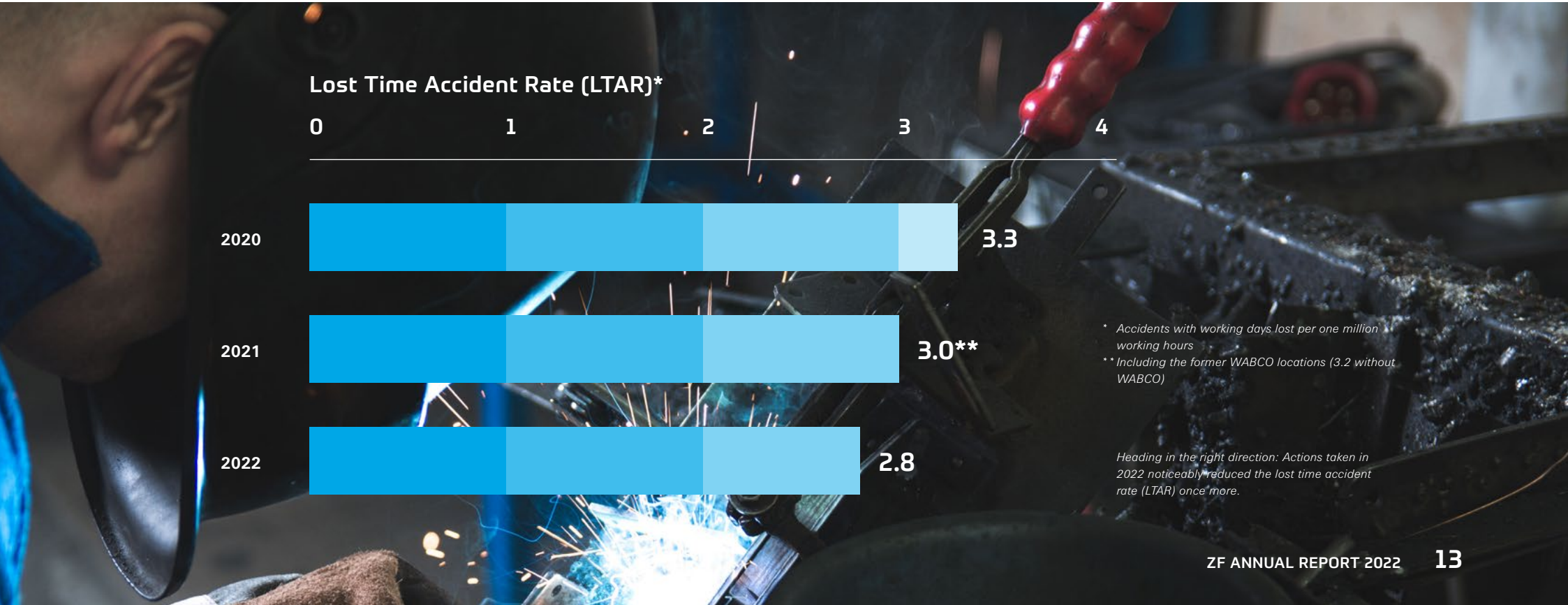
This initiative pursues the approach of involving both executive managers and employees – safe working is demanded and valued. A consistent top-down approach and broad-ranging, continuous communication keep the attention high on the topic of occupational safety and health. This includes daily information on current incidents and unsafe situations provided by executive managers to employees as well as the use of additional communication means and media such as videos with personal messages.

The measures prove to be effective: Since mid-2022, the accident rate has dropped significantly by almost 10 percent compared to the previous year. The joint efforts in this field as well as the active involvement of executive managers and employees contribute to a sustainable improvement of occupational safety and health. As a result, the staff and the company benefit equally from the increased quality of working conditions and the corresponding results.

More about occupational safety and health at ZF

"At ZF, the safety, health and well-being of all employees are core values integral to the corporate culture. As a company, we feel responsible for our own employees but also for the people who work with us along the value-added chain."

Sabine Jaskula Chief Human Resources Officer and Director of Labor Relations of the ZF Group



* Accidents with working days lost per one million working hours
** Including the former WABCO locations (3.2 without WABCO)

Heading in the right direction: Actions taken in 2022 noticeably reduced the lost time accident rate (LTAR) once more.

ZF Compliance – Acting for lasting values

Code of Conduct and ZF Trustline help to comply with the rules

More about compliance at ZF

Compliance is an integral part of the ZF Group and sustainability strategy.

Corporate Compliance Prevention Management identifies risks and prevents violations of rules through regular training and education.

The ZF Code of Conduct is a key element. Its binding rules apply to all ZF employees. Using plain language, it describes the principles of ethically sound behavior in daily dealings and with business partners.

In individual cases, the Compliance HelpDesk can provide assistance. The HelpDesk was approached 326 times last year – especially for questions about gifts, invitations and other gratuities.

The ZF Trustline provides a notification system that employees, customers, business partners and others can use to report potential compliance violations – also anonymously. In 2022, 162 notifications were received via ZF Trustline. In addition, the ZF Compliance Team received 93 notifications via other internal channels.

"Sustainability must be integrated into all key business processes"

Dr. Michael Karrer, Senior Vice President Sustainability & EHS, on ZF's commitment to sustainability

Dr. Karrer, how important is sustainability to ZF's business success?

Sustainability is a determining factor for our long-term competitiveness. It is not just about sustainable action by the company. It is also about sustainable products and business models. To this end, sustainability must be integrated into all key business processes. Our climate targets can be found, for example, in strategic and operational planning as well as in the product development and purchasing process. Design and material selection significantly influence the product carbon footprint. This is how we create the prerequisites for long-term transformation. The same logic also applies to the other aspects of sustainability.

The German Act on Corporate Due Diligence Obligations in Supply Chains (Lieferkettensorgfaltspflichtengesetz) came into force on January 1, 2023. How is ZF prepared for this, especially when it comes to human rights?

We prepared meticulously for the start of this legislation and created the necessary structures. A cross-functional Human Rights Working Group is looking into integrating the core elements of the Human Rights Due Diligence approach into the relevant business processes. This includes expanding risk management. We are also revising the Global Business Partner Principles to flesh out requirements for social and ecological issues.

Dr. Michael Karrer is responsible at ZF for sustainability, environmental management and occupational safety and health throughout the Group.

Here you will find more information about sustainability

Sustainability in practice: Remanufacturing is a top priority at the Bielefeld location.

The same high quality standards apply as to the production of new parts.

Where is ZF involved so it can position itself and participate outside the company?

ZF actively participates in the "Branchendialog Automobil", an automotive industry forum run by the Federal Ministry of Labor and Social Affairs. Its goal is to improve the human rights situation along the global supply and value-added chains. In 2022, ZF became a member of the Responsible Supply Chain Initiative (RSCI), which helps the industry promote sustainability in its supply chains. The RSCI standard enables audits of own locations and the supply chain to create transparency on working conditions.

What role does the circular economy play in ZF's strategy?

Increasing geopolitical tensions also lead to a reassessment of global supply chains. This gives the circular economy a strategic dimension: Reusing materials not only helps significantly reduce product-related emissions in the manufacturing process, but also reduces our risk in raw material procurement. The findings so far have been incorporated into a ZF Circularity Framework that makes the future fields of action transparent and covers a product's entire life cycle.

How do you implement the circular economy in practice?

A good example is remanufacturing. Industrial remanufacturing restores products that are no longer functional to the condition they were in when new. This saves materials, energy and costs. ZF offers remanufacturing for more than 250 product types at 25 ZF locations in 15 countries at present. Our Bielefeld location received the German Award for Sustainability Projects for its long-standing activities in this field. Furthermore, ZF participates in cross-company projects, such as the EU project SUSMAG-PRO, which deals with the recycling and reuse of rare earth magnets from electric motors.

ZF's Bielefeld remanufacturing plant won the German Award for Sustainability Projects in 2022.

In the photo (from left to right): Location manager Jörg Witthöft, patron and Federal Minister Brigitte Zypries (retired) and Michael Reinhart, Regional Operations Officer of the ZF Commercial Vehicle Division, at the award ceremony in Berlin.

Transformation

The transformation aims to boost competitiveness and focus on future-oriented products that generate profit in a sustainable manner. Software and power electronics are shaping the electrically driven car of the future and digitalization is revolutionizing the mobility sector. The ZF portfolio is helping drive this development.

03

Lean Validation and Digital Twin save more than €100 million in 2022

New methods and tools significantly increase development efficiency

Less work, material and time: Digital twins allow enterprises to save and operate more sustainably on many levels. ZF has also been working to achieve this across its divisions for years. The objective is to make the development and testing phase of new products far more efficient. And ZF has achieved this: In 2022, the inclusion of simulations in ZF's Lean Validation method made a significant contribution to the €103 million saved here.

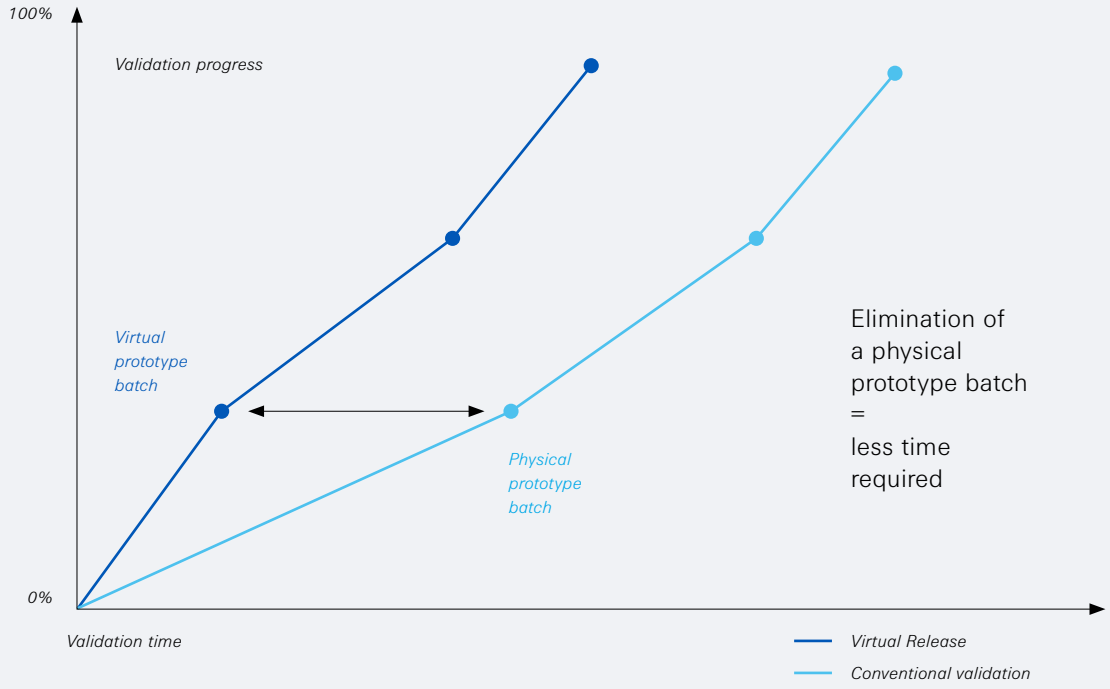
It works like this: Digital models supplement the tests on real prototypes. Products can therefore be developed and validated much faster, more efficiently and more cheaply.

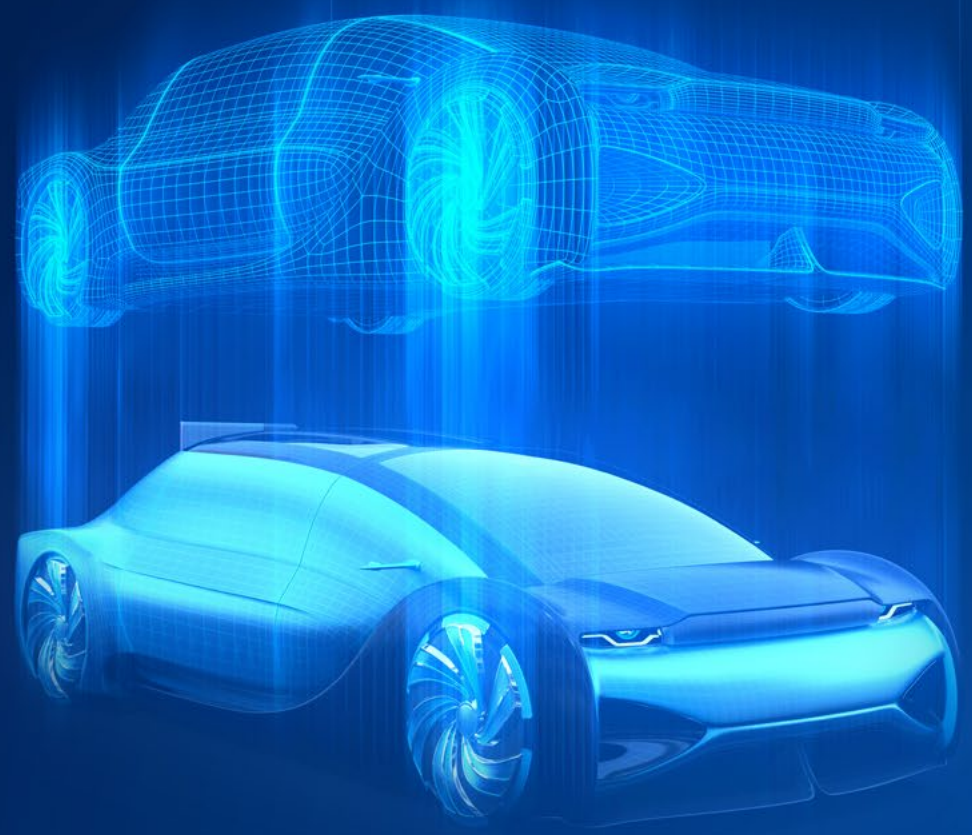
The next step will follow in 2023 with the Virtual Release initiative and the goal of massively reducing development time with virtual product tests and the elimination of an entire prototype batch.

More information about Lean Validation and digital twins

The next step: Virtual Release

The virtual development method is to eliminate physical construction stages for ZF by 2025, which would shorten the validation time by about one third.





Better together
Working on digital twins in ZF's product development boosts efficiency and improves cross-divisional cooperation.

Digital twin
The digital representation of a real product is used in development to save time, money and material. This is not only more sustainable, but also makes the ZF Group even more competitive.

Cloud platform rolled out successfully

Declaring war on potholes: The Road Condition Monitoring application generates added value from the data ZF collects in intelligent chassis sensors and sends to the cloud.

ZF OZEAN removes data silos and enables new business models

ZF is moving with the times, demonstrated in part by the rollout of the OZEAN cloud platform in 2022. The system is based on Microsoft Azure and not only helps ensure data can be used across divisions. ZF also creates new business models by using data generated by sensors and applications in vehicle components, while also increasing the pace of development.

Road Condition Monitoring, for example, is a specific application run in the ZF OZEAN cloud since 2022. Vehicles equipped with the Smart Chassis Sensors collect road condition data. ZF is developing an algorithm-based service, aggregating the data into an up-to-date view of road roughness, locations of potholes, speed bumps and other road damage. The Road Condition Monitoring service is made available through an Application Programming Interface (API). The service can be used to warn road users about pothole and speed bump events, and for road maintenance.

Just one example of how the new cloud platform generates added value from data.

More about ZF's cloud platform

Tailwind for own ideas

"Be the CEO of your idea": How ZF promotes new ideas from employees

Colored cardboard boxes help motivate many employees. These boxes symbolize their own ideas, which are given time to grow at ZF. Someone with an idea first needs to submit it and gets a red box in return – and from then on, one day a week for two months to validate the idea. When the two months are up, the person that produced the idea looks for a sponsor within ZF, according to the motto "I'm the CEO of my idea!". Once they've found a sponsor, they get a blue box. From then on, they've not only got time, but also a budget so they can fine-tune the idea.

ZF launched the project in September 2021 and since then the approach has established itself as a successful innovation method.

In the first year, the ZF Kickbox team received around 50 ideas from nine divisions. And we've now even got the first golden box that symbolizes the idea is being implemented. ZF employee Rebecca Kleint had the idea for a software assistant that helps employees develop further in the company. The EDA assistant will soon be rolled out worldwide at ZF.

1

The red box starts the ball rolling. Anyone that believes in their idea gets one day a week for two months to work on the idea.

2

After two months' validation, each idea must find a sponsor. One option is to participate in a pitch event. The reward is a blue box.

3

Introducing one of the winners: Rebecca Kleint was the first ZF employee to transform a red box into a blue box and then into a golden box. Her idea will be pursued as an official project.

More about the Kickbox initiative

"What makes the Kickbox program so special is that a lot of trust is placed in the participants. The program inspires a spirit of innovation that would otherwise have been stifled without bottom-up solutions like this one."

Rebecca Kleint
First ZF employee whose Kickbox idea became an actual project.

Group-wide qualification campaign rolled out

20,000 employees have already taken part

Everything started with the E-Cademy – a further training initiative of ZF's Electrified Powertrain Technology Division to prepare for requirements of the future. The initiative proved a resounding success, with some 20,000 employees already having taken part. In the Talent & Learning category, the E-Cademy even won the Personalwirtschaftspreis 2022.

All 82,000 ZF employees with a PC workstation have access to the successful concept under its new name: SkillsHub. After the experience with the E-Cademy showed the importance of understanding trends to be able to follow the transformation, the course material was expanded with the megatrend digitalization and incorporated into the SkillsHub.

The concept is proving popular: Just six weeks in and we had already received the ten thousandth registration. And more people are registering all the time. Moreover, it is now also possible within the scope of the SkillsHub to add learning contents for further trends.

High acceptance: Another 10,000 registrations were received within just six weeks after the platform was renamed the SkillsHub.

Technology

ZF invests in the fields of technology that are particularly promising and contribute to future mobility. The company consistently relies on digitalization and software to create new opportunities for its products and to make driving cleaner, safer, more efficient and more comfortable.

04

Pushing efficiency almost to the limit

96.3%*
EVmore

85%**
electric drive

35%**
gasoline drive

ZF demonstrates the possibilities of the EVmore

In fall 2022, ZF used the EVmore to demonstrate how much potential lies in electric mobility. The concept vehicle achieves up to 96.3 percent efficiency – from the battery to the wheels. Effectively, almost all the electrical energy stored in the battery is converted into propulsion.

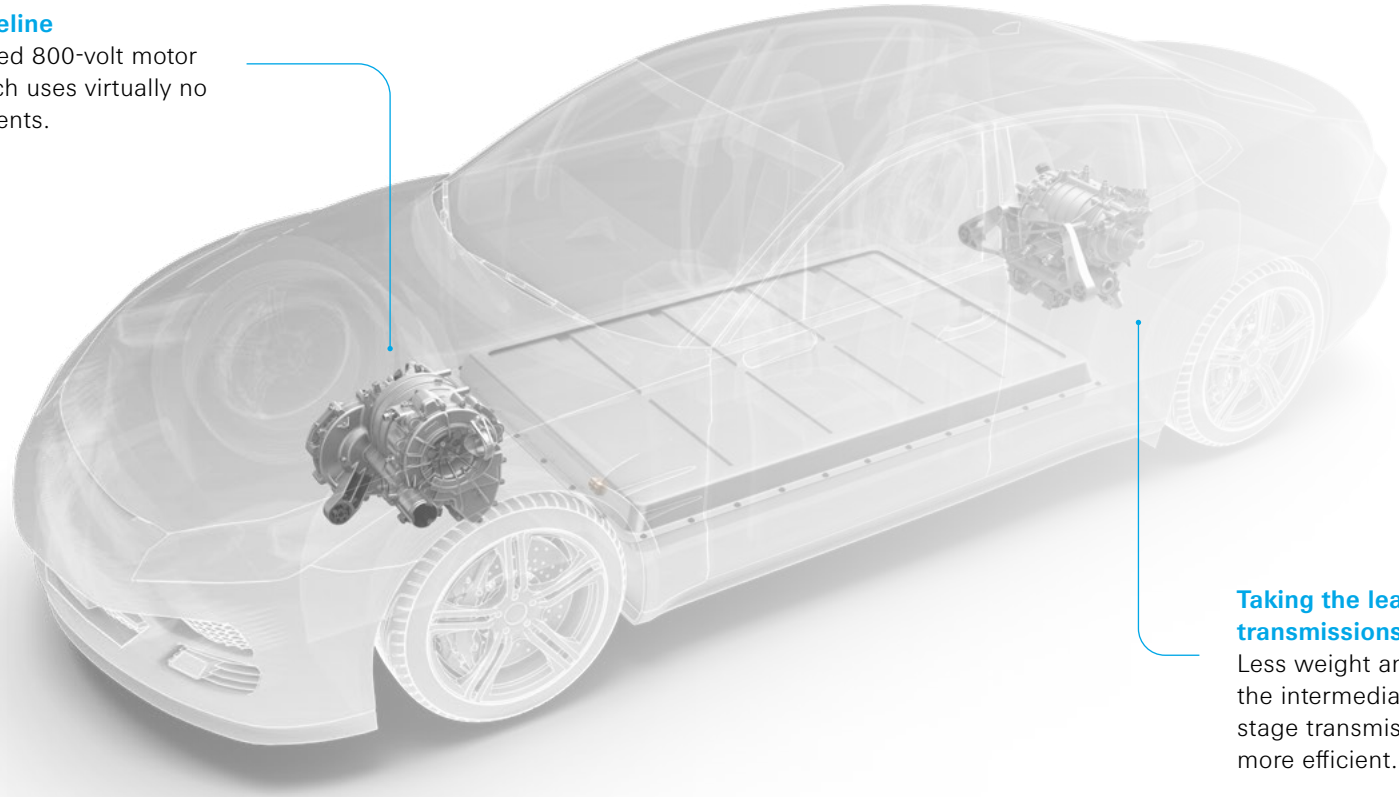
Compare that with an average gasoline drive with an efficiency of just 30 to 40 percent. Conventional electric drives achieve efficiencies of around 80 percent. The reason why the EVmore is highly efficient can be found among other things in ultra low friction losses, sophisticated inverter software and fewer moving parts in the drive.

Find out more about the EVmore

* *Absolute maximum value*
** *Average value*

With its EVmore drive concept, ZF shows how new ideas for optimized components of the electric drive-line can make the overall system far more efficient and sustainable.

The heart of the driveline
The efficiency-optimized 800-volt motor on the front axle, which uses virtually no heavy rare earth elements.



Taking the lead from motor racing transmissions
Less weight and the elimination of the intermediate shaft make the single-stage transmission in the EVmore more efficient.

"With the EVmore, we reduced drive losses by 30 percent compared to the volume production vehicle we selected."

Dr. Stephan Demmerer
Electrified Powertrain Technology

800-volt power

All-electric SUV Lotus Eletre debuts in 2023 with numerous ZF innovations

Never before has ZF managed to incorporate so many innovations in one new vehicle as in the Lotus Eletre, which will celebrate its premiere in 2023 and go into volume production. The centerpiece is the integrated 800-volt high-performance electric drive system consisting of electric motor, power electronics including control software, reduction gear unit with differential, drive shafts and motor control software from ZF. The 800-volt inverter with state-of-the-art silicon carbide technology as well as innovative insulation and cooling concepts ensure high power density and efficiency. Total output is up to 675 kW; maximum torque is 985 Nm.

The chassis of the Lotus Eletre also showcases ZF innovations: With the cubiX chassis control software, the first SUV from the legendary sports car brand offers a key technology that controls all chassis functions such as brakes, front and rear axle steering, the active roll stabilization system as well as the electric drive.

The 800-volt high-performance system allows the Lotus Eletre's 112 kWh battery to be charged from 10 to 80 percent in just 20 minutes.

As a fully networked system, the cubiX chassis control software sets new standards for driving dynamics and comfort.

"The great interest of manufacturers in our products in both the passenger car and commercial vehicle sectors is impressively confirmed by our high order backlog in the high-voltage business."

Stephan von Schuckmann
Member of the Board of Management of ZF and Head of the Electrified Powertrain Technology Division

From premiere to volume production in just a year: The CeTrax 2 central drive is being rolled out

Compact electric drive for heavy commercial vehicles

Find a video on the CeTrax 2 here

Designed for heavy commercial vehicles, the electric central drive offers two integrated inverters with 800-volt and SiC technology, a 3-speed transmission with two hairpin electric motors and is suitable for vehicles with a gross vehicle weight rating of 44 tons.

This year, ZF will supply vehicle manufacturer DAF Trucks with the new CeTrax 2 electric central drive. The unit celebrated its premiere at the IAA in September 2022. As a result, DAF can offer a 40-ton truck with a zero-emission range of over 500 kilometers.

The highly integrated, modular and electric central drive for heavy commercial vehicles offers two powerful, oil-cooled hairpin electric motors, two integrated inverters on an 800-volt silicon carbide basis and a powershift-capable 3-speed transmission.

The compact design of the ZF solution is a compelling proposition for vehicle manufacturers as it allows electric and internal combustion vehicles to be produced on the same platform. For the same reason, existing vehicle platforms can be electrified quickly and easily. CeTrax 2 has a continuous output of 380 kW and develops peak torque of 24,700 Nm. Compare that with an average electric car that delivers peak torque between 300–500 Nm. The integrated 3-speed transmission with intelligent electronics and electric actuators also ensures smooth and almost imperceptible gear shifts.

CeTrax 2 is a compact solution that fits into the installation space of the transmission in a conventional truck. In this way, commercial vehicles can optionally be built with a combustion engine or electric drive based on a single vehicle platform.

ZF ProAI: Full order books

High Performance Controller industrialized and ready for market

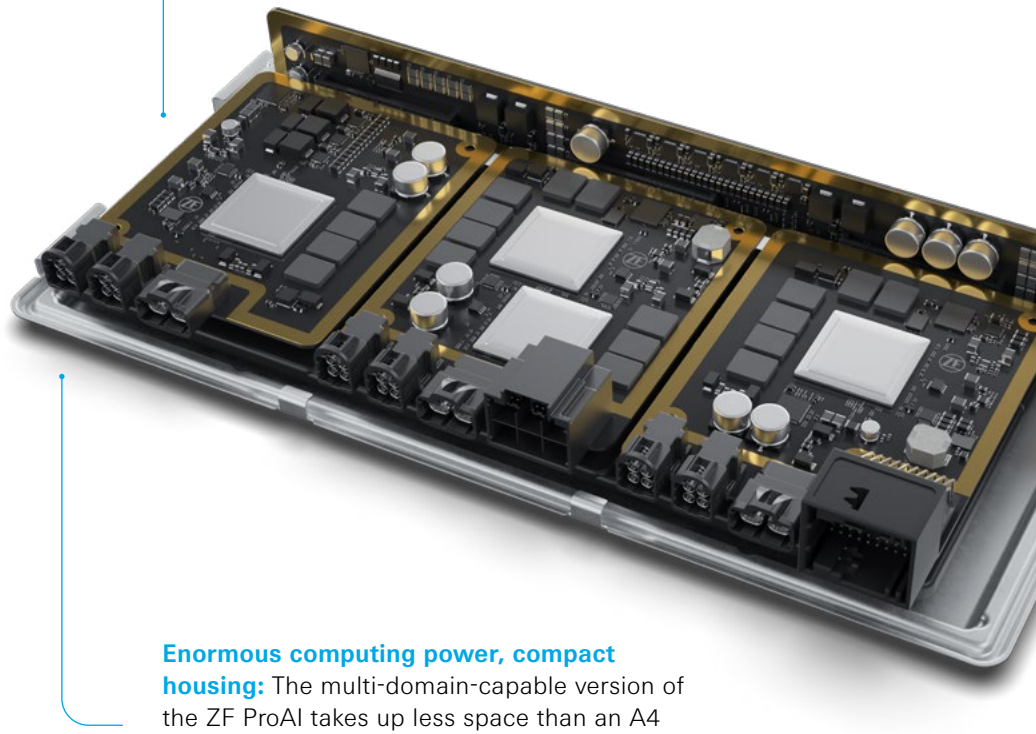
Computing power for the future of mobility is outpacing Moore's law. In the future, advanced driving and comfort functions will be implemented in increasingly centralized E/E architectures with just a handful of ultra powerful central computers. One of them is the ZF ProAI. The High Performance Controller (HPC) perfectly meets manufacturers' requirements for the software-defined vehicle.

At the CES 2023, ZF presented a new multi-domain-capable edition of the ProAI high-performance computer. The new model enables automotive manufacturers to combine and operate domain-based functions – such as ADAS, chassis or infotainment – on separate boards in a central control unit. Each of the individual boards can be fitted with microprocessors from different providers and also with different operating systems at the same time – for example with QNX for ADAS or Android Auto for infotainment functions.

Besides this flexibility, the new version is even more efficient, allowing ZF to increase total computing power to over 1,500 TOPS (Tera Operations Per Second) – on an area that takes up less space than an A4 notepad. So far, more than 14 million orders have been placed. The start of the supply is scheduled for 2024.

High demand: 14 million units have already been ordered. Delivery starts in 2024.

More information about ZF ProAI



Enormous computing power, compact housing: The multi-domain-capable version of the ZF ProAI takes up less space than an A4 notepad and can host several operating systems in parallel with a total computing power of up to 1,500 TOPS.

Next shuttle generation

Autonomous transport system to revolutionize urban mobility

True to the motto Unlock Mobility, ZF develops autonomous transport systems for modern, safe and efficient mobility. This involves freeing mobility from the burden of congestion, noise and emissions – especially in urban areas.

A decisive step here is the next ZF shuttle generation, which premiered at the Consumer Electronics Show 2023 (CES) in Las Vegas in early January. The new shuttle is equipped with state-of-the-art sensor technology that guarantees precise environment recognition. However, ZF sees itself not only as a shuttle provider, but also as a technology leader with a comprehensive mobility concept. Besides the shuttle and the virtual driver – ZF's AD software –, ZF offers its customers a complete service from the planning and implementation of shuttle lines to vehicle operation and maintenance.

The first shuttles will soon be entering service in the USA. There, ZF announced – also at the CES – the cooperation with its new customer and partner Beep. The partnership aims to deploy several thousand units of ZF's next shuttle generation over the medium term in the United States.

"What we see today in many cities is a mobility concept that no longer works. Our autonomous transport system is an efficient and safe solution to solve this challenge."

Torsten Gollewski
Executive Vice President Autonomous Mobility Systems at ZF

State-of-the-art sensor technology, selectable battery capacities, space for up to 22 people: ZF's next autonomous shuttle generation can be used in urban environments and mixed traffic.

More about the new ZF shuttle generation

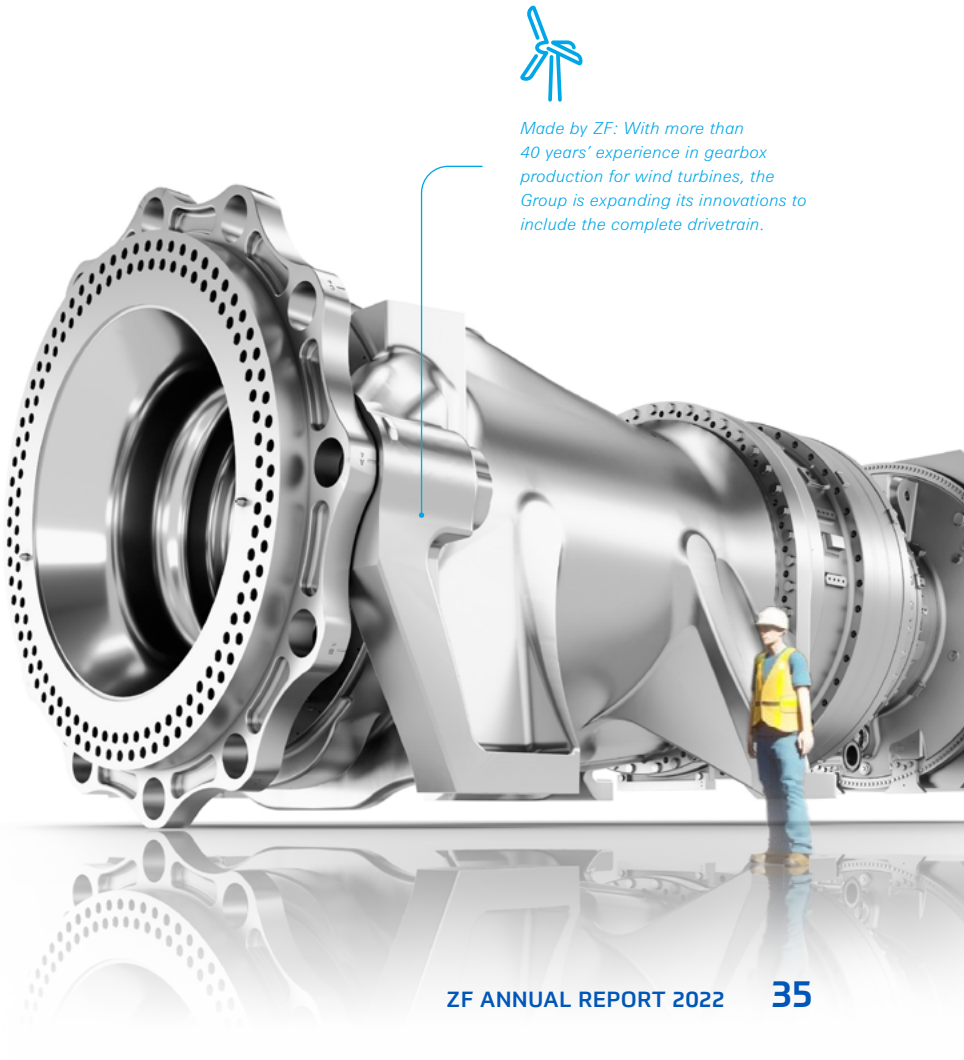
New test center for wind turbines

ZF builds powerful test bench for growing requirements

The wind of change: Dynamic developments in the wind power market will require a whole-new level of testing and validation of modular drivetrains in the future. That's why the world's largest test facility for wind power systems is now being built in the heart of Europe – by ZF.

With its Wind Power Business Unit, the Group is a leading global manufacturer of gearboxes for wind turbines. More than 80,000 ZF gearboxes currently power wind turbines all over the globe, producing a total output of 180 gigawatts. This amount of power is enough to supply 150 million households with climate-neutral energy. And demand is constantly rising – with increasingly demanding technical requirements.

ZF is therefore investing in its own test center in Lommel, Belgium, with the world's most powerful and largest test bench for wind turbines. With an output of 30 megawatts and a length of 60 meters, the test bench will validate complete driveline systems for onshore and offshore applications from 2024. The functional behavior of the main bearings, the gearbox and the generator is tested under real conditions. The tests form the basis for further ZF innovations to actively drive forward the development of renewable energies.

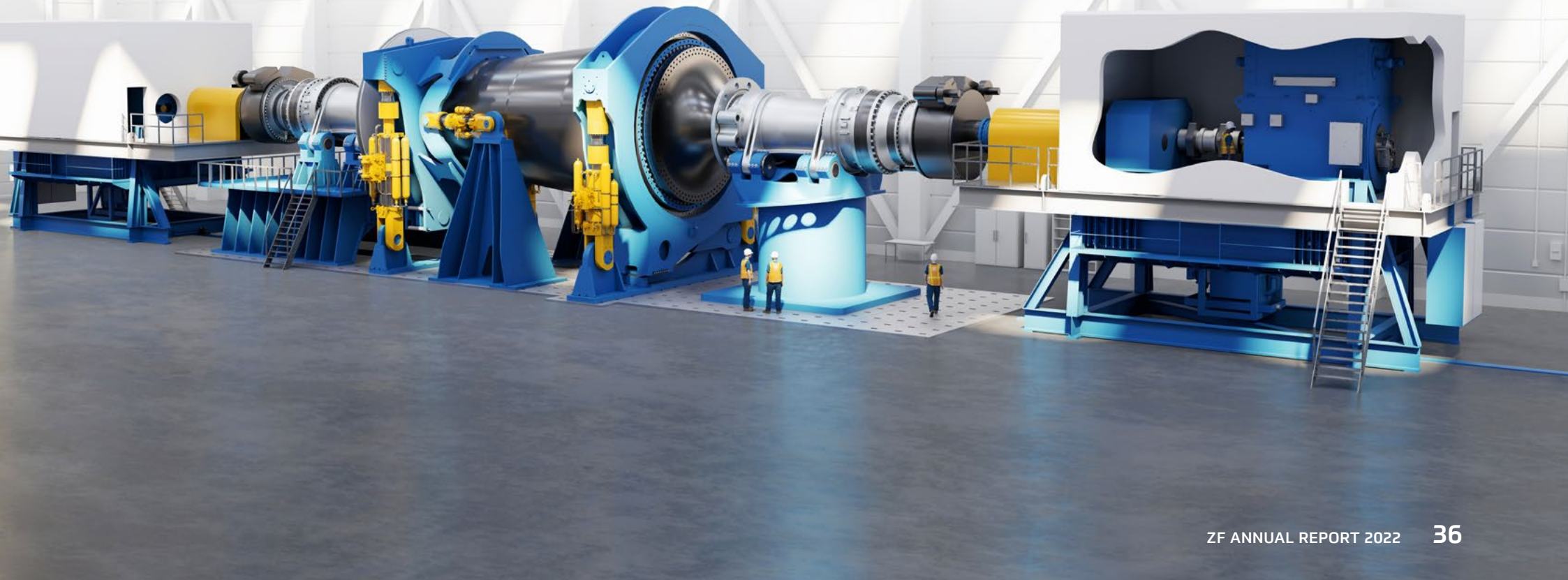


Made by ZF: With more than 40 years' experience in gearbox production for wind turbines, the Group is expanding its innovations to include the complete drivetrain.

Industry-leading test and prototype center

The 30-megawatt test bench validates complete drivetrain systems for onshore and offshore turbines.

Here you will find more information about ZF wind power technology



Management

Board of Management Letter

DR. HOLGER KLEIN

Dear Reader,

When we went into the first coronavirus lockdown almost exactly three years ago, no one could have imagined that the global pandemic crisis would give way two years later to another profound turning point: Russia's invasion of Ukraine. Just a few days ago, a year on – and the invasion means the economy faces yet another challenging situation. Following 2019, which saw the automotive market shrink, the next two pandemic years, and 2022 – the year that brought war to Europe – 2023 is the fifth year of crisis in a row.

2022 was marked by a lack of semiconductors, a shortage of raw materials and tight supply chains. Spiraling energy prices and high inflation rates due to the war in Ukraine have aggravated the situation even more over the past twelve months.

Despite the challenging business environment, ZF made good progress in implementing its strategy in 2022. This applies, for example, to our aftermarket organization, which has grown profitably for the third year in a row. Our achievements also include the presentation of new by-wire technologies and the start of volume production of the 800-volt silicon carbide inverter for electric mobility. Our customers confirm that investments in trendsetting technologies pay off: In 2022, ZF reported the highest order intake in the company's history. Electric mobility alone accounts for a volume of well over €25 billion on the books through 2030.

In the next few years, ZF will be able to implement the transformation from conventional transmissions to electric drive solutions and offset the elimination of drive systems for vehicles with internal combustion

"Our currently most important task this year is to focus on specifically advancing technological change."

engines. Our attention must now focus on the large-scale production of these new technologies. The computers in the ZF ProAI family are just one example of this industrialization. This supercomputer for software-defined vehicles will go into volume production next year and is one of the most powerful of its kind.

As in the years of crisis before, volume growth and, in turn, a basis for increasing productivity were likewise absent in 2022. Against this backdrop and given the abovementioned challenges, we adjusted our profit planning in the second half of the year and were almost exactly in the middle of our adjusted target range with an adjusted EBIT margin of 4.7%. With adjusted free cash flow, we achieved the revised target of €0.5 billion, which is below the originally planned figure, though. Sales rose by around 14% to €43.8 billion. However, only a small part of this growth is organic and is mainly attributable to inflation and currency effects.

It is clear that we cannot be satisfied with these results. For this reason, our most important task this year is to focus on specifically advancing technological change. Our Next Generation Mobility strategy remains

trendsetting for ZF. However, we aim to boost the pace of implementation.

With that in mind, we consistently review the ZF technology portfolio and prioritize the projects that promise us sustainable income. To adapt better to market conditions, ZF has launched a comprehensive performance program for all divisions. We will speed up processes, simplify decision-making channels in the company — and above all, pay attention to strict cost management discipline. The efficiency gained enables ZF to make new and targeted investments in high-income future technologies.

One of the changes required is that we develop our corporate structures faster to adapt them even better to the needs of the market and customers. Some projects were already launched last year. For example, we are preparing the merger of the two divisions Car Chassis Technology and Active Safety Systems into a new division for chassis, steering and brake technology. The new division will be unique in the market because no other supplier offers technology from a single source that dominates all three dimensions of the movement of a vehicle. In addition, we have begun to look for external investors for compelling technology fields with very good growth potential and high investment requirements. These include the Passive Safety Systems Division, the conventional passenger car axle business and the shuttle business.

One project like no other illustrates ZF's commitment to the transformation in the automotive industry. The partnership with U.S. company Wolfspeed for the development and production of silicon carbide semiconductors in Germany, which was unveiled in early February, is an important step for us toward a zero-emission future of mobility. Silicon carbide semiconductors drastically reduce power losses in all power-electronics converters. They have decisive advantages over conventional silicon-based products, such as higher efficiency, higher power density and improved reliability. And they enable smaller system designs. Put simply, an electric car charges faster, has a greater range and offers more space when fitted with silicon carbide-based semiconductors. The cooperation with Wolfspeed includes the semiconductor factory in Ensdorf, Saarland (Germany), as well as a research and development center at another at present unconfirmed location in Germany. Above all though, the partnership ensures our company access to silicon carbide semiconductors that are so important for electric mobility and the energy transition. In addition, the technology of ZF's growing Wind Power Business Unit brings decisive advantages.

This year's Annual Report is entitled "Acting now." – it is our commitment to the goal of full climate neutrality by 2040 and to the ten principles of the United Nations Global Compact. By the end of the decade, we aim to reduce our emissions by 80% compared to 2019. In order to better align the company to these ambitious targets, we will include Environmental Social Governance (ESG) criteria in our top management remuneration strategy for the first time this year. "Acting now." underscores our aspiration to act *now* for climate protection, human rights and, overall, for a bright future on a healthy planet.

For this, we need a strong team. We will only manage to achieve the company transformation by working together. That's why I would particularly like to thank our employees who rose to the challenges with and for us in 2022. Thanks to them, we have achieved key milestones. Together, we are now working to build on these successes.

I would like to thank the shareholders' representatives and the members of the Supervisory Board for their constructive support over the past year and for the trust they place in me.

I am looking forward to 2023. The year will be challenging, but it is in our hands to take full advantage of the opportunities open to us.

Dr. HOLGER KLEIN
Chief Executive Officer

THE BOARD OF MANAGEMENT
from left to right:
Michael Frick
Sabine Jaskula
Stephan von Schuckmann
Dr. Holger Klein
Dr. Peter Laier
Dr. Martin Fischer

The Board of Management

Dr. Holger Klein, Chief Executive Officer
Sales, Research and Development, System House of Autonomous Mobility Systems, Aftermarket

Dr. Holger Klein has been Chief Executive Officer of ZF Friedrichshafen AG since January 2023. In 2014, the industrial engineer with a PhD in Technology Management moved from the McKinsey consulting company to ZF as a long-standing international industrial expert. He initially managed the integration of the acquired U.S. Group TRW Automotive before taking over as head of the Car Chassis Technology Division in 2017. Dr. Holger Klein has been a member of the Board of Management since fall 2018. He also headed the Corporate Production Function, the Regions of Asia-Pacific and India as well as the Aftermarket Division through the end of 2022.

Dr. Martin Fischer
Quality, Regions of North and South America, Passive Safety Systems, Active Safety Systems, Electronics and ADAS, Car Chassis Technology

Dr. Martin Fischer has been a member of the Board of Management of ZF Friedrichshafen AG since November 2019. In addition to his previous areas of responsibility, he has taken over management of the Car Chassis Technology Division from his base in the United States in January 2023. Before the electrical engineer with a PhD title joined ZF, he spent about two decades working as a senior manager at major automotive suppliers. There, he shaped new business areas in numerous vehicle domains by introducing electronics and software.

Michael Frick, Chief Financial Officer
Finance, IT and M&A

On December 1, 2022, Michael Frick joined the Board of Management of ZF Friedrichshafen AG and assumed the position of Chief Financial Officer as of January 1, 2023. After working for consulting and industrial firms, the business graduate has been active in the automotive supplier industry since 2003. Following management roles in Finance, Controlling and Purchasing, he was appointed Commercial Manager of Mahle-Behr in 2011. From 2014 to 2022, he was responsible for finance in the Mahle Group as a member of the Group Management Board and led the company as Chief Executive Officer on a temporary basis twice during this period.

Dr. Peter Laier

Production, Region of India, Commercial Vehicle Solutions, Industrial Technology

Dr. Peter Laier has been a member of the Board of Management of ZF Friedrichshafen AG since January 2023. The mechanical engineering graduate first worked as a scientific assistant at the Fraunhofer Institute for Manufacturing Engineering and Automation, then did his PhD at the University of Stuttgart and started his industrial career with Continental. There, he held various management functions in Germany and Asia from 2000 to 2012. This was followed by appointments to the Management Boards of Osram and Benteler International before moving to Knorr-Bremse in 2016 where he became member of the Executive Board responsible for the commercial vehicle segment.

Sabine Jaskula, Chief Human Resources Officer/ Director of Labor Relations

Human Resources, Sustainability, Legal and Compliance

Sabine Jaskula has been a member of the Board of Management of ZF Friedrichshafen AG since January 2019. She began her professional career in 1998 as Head of the Legal Department at Mast-Jägermeister SE before working as a lawyer for labor and competition law at an international law firm. In 2001, she moved to HR and assumed the position of HR Manager at Benecke-Kaliko AG. From 2004 to 2018, Sabine Jaskula worked in various management functions at the Continental Group in Germany and China. She was Head of Human Resources in various business units, Head of International Assignments and Senior Vice President HR in the ContiTech division.

Stephan von Schuckmann

Materials Management, Region of Asia-Pacific, Electrified Powertrain Technology

Stephan von Schuckmann has been member of the Board of Management of ZF Friedrichshafen AG since January 2021 for the back then newly founded Electrified Powertrain Technology Division and is responsible for expanding ZF's position in electric mobility. As of January 1, 2023, he additionally took over the management of the Region of Asia-Pacific as well as the Corporate Materials Management Function and relocated to Asia. The business administration graduate joined ZF Friedrichshafen AG in 2003. After various management positions, he moved to the Car Powertrain Technology Division in 2015 as Senior Vice President for Finance, IT and Process Management before taking over as head of the division from 2018 to 2020.

Strategy

Our Next Generation Mobility strategy continues to provide the right framework for our actions. In a difficult environment, it provided important orientation. Our strategic focus is on technology transformation, sustainability and digitalization.

Despite the difficult environment, structural transformation in the automotive industry continues unabated. Increasing levels of electrification, greater uptake of automated driving functions and new electronic vehicle architectures in passenger cars as well as in commercial vehicles are fueling this transformation. With our Next Generation Mobility strategy, we are developing comprehensive solutions for these challenges. Our portfolio serves the entire range of components. In addition, we increasingly present ourselves as an integrated systems supplier that will play a decisive role in shaping future mobility. The constantly increasing pressure on margins also requires stricter prioritization of scarce resources.

Changes in mobility have intensified competition between not only manufacturers but also suppliers. Software, networking and artificial intelligence are defining essential functions for mobility. Consequently, numerous new players from other industries are appearing in the mobility market in order to leverage growth opportunities. We are getting ready for the changed requirements by expanding our digital service portfolio and linking it to ZF's enhanced core competencies.

In the field of electric mobility, we have already successfully implemented our strategic realignment. In the meantime, we have become a technology leader with a complete product portfolio that spans all vehicle segments. The large number of incoming orders confirms we are on the right track. We will strengthen and expand this position in the coming years. In addition, we are pushing forward our development in the fields of digitalization, software, automated driving, vehicle motion control and integrated safety. We are also opening up new mobility segments, for example in micro-mobility or with autonomous shuttle systems. Strategic partnerships, such as with Microsoft, help us become a cloud-based mobility service provider.

Acting now. – Sustainability@ZF

Sustainability is an integral part of ZF's Next Generation Mobility strategy. Central to the implementation of the ZF sustainability strategy "Acting now. Sustainability@ZF" is the goal-oriented cooperation within the Group and with external partners.

In addition to its commitment to the principles of the UN Global Compact, ZF is committed to the Sustainable Development Goals (SDG) of the United Nations. Goal 17, which calls for partnership to achieve the 2030 agenda, underlines the importance of cooperation to meet the complex and diverse challenges of the future.

As a founding member of the First Movers Coalition in the World Economic Forum (WEF), ZF aims to jump-start the demand for zero-emission technologies and to help these technologies achieve wide-scale market penetration faster. In this way, ZF is supporting the goal of achieving climate neutrality along the value chain by 2040.

To shape human rights due diligence beyond legal obligations, ZF is involved in associations and initiatives, such as the industry dialogue for Business and Human Rights, comprising stakeholders from the automotive industry and civil society. Reliable structures are created and new approaches are piloted across company boundaries.

To efficiently enforce requirements and values in the automotive supply chain, ZF became a member of the Responsible Supply Chain Initiative e.V. (RSCI) last year to advance the development of suitable mechanisms and tools. This collective action helps those involved to progress in a targeted and efficient manner.

The consistent integration of sustainability into central control processes within and outside the Group is the task that ZF is now fulfilling.

Digitalization – becoming a data-driven company through efficient processes

The key component of our digitalization strategy is the ZF cloud, which consolidates all relevant data and production processes of the plants and uses modern AI-based programming methods for further analysis. Furthermore, we transfer all applications to the ZF cloud, creating a comprehensive database that we use to automate processes.

In addition, we are also implementing our program for standardizing all business processes based on the new SAP S/4HANA technology in the ZF cloud with a view to rolling out this state-of-the-art solution in all areas by 2030. Besides process efficiency, the improved user interface is also important in placing employees in the focus of the digital transformation. Finally, the newly established SkillsHub learning platform forms the basis for the skills transformation of all employees. Here, centralized methods and technologies are made available in a sustainable manner.

By 2030, we will have standardized all business processes across the board and implemented them with AI-based autonomy. Furthermore, we will have implemented IoT methods to increase productivity in our production processes.

High development performance accompanies the transformation in vehicle technology

With digital innovations and ever increasing investments in research and development, we are developing, alongside our existing traditional core business, into one of the leading electronics and software suppliers – with technology for electric mobility, vehicle motion control, semi-autonomous and autonomous driving, with central high-performance computers, connectivity solutions and software that enables new functions. We are already active in the field of electric mobility as an overall systems supplier for passenger cars and commercial vehicles, for which we also supply the centerpiece of the electric powertrain – the power electronics. This will enable us to achieve significant and necessary growth to offset the declining demand for pure combustion engine-dependent components in the medium term.

The change in vehicle technology, which accelerated considerably over the past few years, also resulted in more dynamic development in the ZF Group. Here comes the payoff for the years of early investments in the development of a range of central high-performance computers that our customers are increasingly using. In this way, we will also be among the leading suppliers in this field in the coming years and we managed to secure new customers in 2022.

For passenger cars, we see great potential for driver assistance functions, also known as Level 2+ systems. With higher levels of automation, Levels 3 and 4 in passenger cars, technology and market maturity will only come much later. Some commercial vehicle segments and particularly urban public transportation are more likely to be able to use fully automated systems earlier. Autonomous driving functions used in vehicles driving in self-contained areas – such as depots and factory sites – as well as on specific routes are already paving the way. Our company is well-positioned to cater to both trends.

The trend toward electric mobility has received a very strong boost due to regulatory interventions and the adapted strategic positioning of vehicle manufacturers. In markets with a suitable infrastructure, we expect purely electric powertrains to prevail in passenger cars and many commercial vehicles. Here, in addition to the powertrain technology, we can make a contribution, for example, with our ZF braking system that recuperates energy, increasing the range of vehicles by up to 15%.

For us, plug-in hybrid drives appear to be an efficient interim solution along the way to the electrification of vehicles. The plug-in hybrid combines the best of both worlds: local emission-free driving and long-distance capability coupled with guaranteed mobility in the event of possible short-term bottlenecks in fuel or electricity supply by using the other energy source in each case. This is a good prerequisite for using this technology for a few years to come.

ZF will no longer pursue fundamental new developments for pure combustion engines. We are preparing for the fact that in major regions of the world hardly any vehicles with combustion engines will be sold after 2035. Their current sales contribution of around slightly over one third can be compensated by solutions from the new technology fields, which can also generate additional growth.

4 plus 1 technology fields for three customer segments

We provide our customers in the three segments of passenger cars, commercial vehicles and industrial technology with products and services that also cover original equipment and the aftermarket. Our digital life-cycle solutions provide a link. With them, we generate added value for our customers through digital offers throughout the entire product life cycle, with digital and networked service solutions in the aftermarket, for example.

In taking the company forward, our strategic focus is on our 4+1 technology fields: electrification, vehicle motion control, automation, integrated safety and digital networking. We are therefore advancing our portfolio across these technology fields and are combining them using integrated solutions:

- **Automated Driving:** Automated driving will make mobility more comfortable and safer, and everyday life easier for people. ZF systems already enable vehicles to see, think and act as well as drive autonomously. This will also lead to innovative mobility concepts for which new suppliers are already positioning themselves. Moreover, for ZF as a component and systems supplier, it is creating additional opportunities across the broad spectrum of mobility.

- **Electric Mobility:** Just like fully electric vehicle drives, hybrid drives are widespread in the market. Their growth rates will continue to rise over the short term until they are replaced by pure electric drives. ZF supplies the core components for electromobility, such as hybrid transmissions, electric motors or power electronics, as well as complete systems for pure battery vehicles – across all vehicle categories from passenger cars, commercial vehicles, agricultural and construction machinery to marine or rail applications and the micromobility sector.

- **Vehicle Motion Control:** The chassis, comprising smart motion-related actuators, plays a major role in ensuring safety, comfort and efficiency in all types of vehicles. We can network and synchronize all systems that affect longitudinal, transverse or vertical dynamics so that cars and commercial vehicles are quiet and safe, regardless of whether they are driven or driverless.

- **Integrated Safety:** Automated and autonomous driving along with intelligent traffic routing will make a vital contribution to avoiding accidents. Nevertheless, occupant safety will continue to play an essential role. ZF already has the most comprehensive safety technology in the supplier industry. It ranges from electronic control units, sensors, brakes, steering systems and seat belts as well as airbags, electronics and central computers with their corresponding software right up to active chassis systems equipped with the actively steering rear axle, for example.

- **+1 Digitalization, Networking and Software:** Electronics, cloud networking and software are central basic modules for the transformation in all four technology fields: ZF will be among the leading manufacturers for mainframe computers. Along the way, our company presented the open software platform "ZF Middleware" and established a global software center to develop individual approaches to customer-oriented software solutions. Individual components are networked into comprehensive systems that are able to act independently with artificial intelligence. With this approach, ZF is working on the software-defined car that uses software functions in a central system, communicating continuously with the cloud. Our cubiX vehicle motion control software is one example of this. ZF's middleware seamlessly integrates these systems.

Five core objectives for balanced evolution

Five objectives form the basis for implementing the strategy for our company, comprising all dimensions of relevance for us. This is how we ensure that the company evolves holistically.

1. **Innovation and cost leadership:** We have a broad product range. This means that we are already setting standards in the markets today. We want to stabilize and enhance this position – through regular innovations and by continuously making large investments in research and development. We secure funding for this also by continuously improving our efficiency and performance. Our cost leadership is vital in safeguarding our global competitiveness. Therefore, we are constantly reducing costs through various programs.

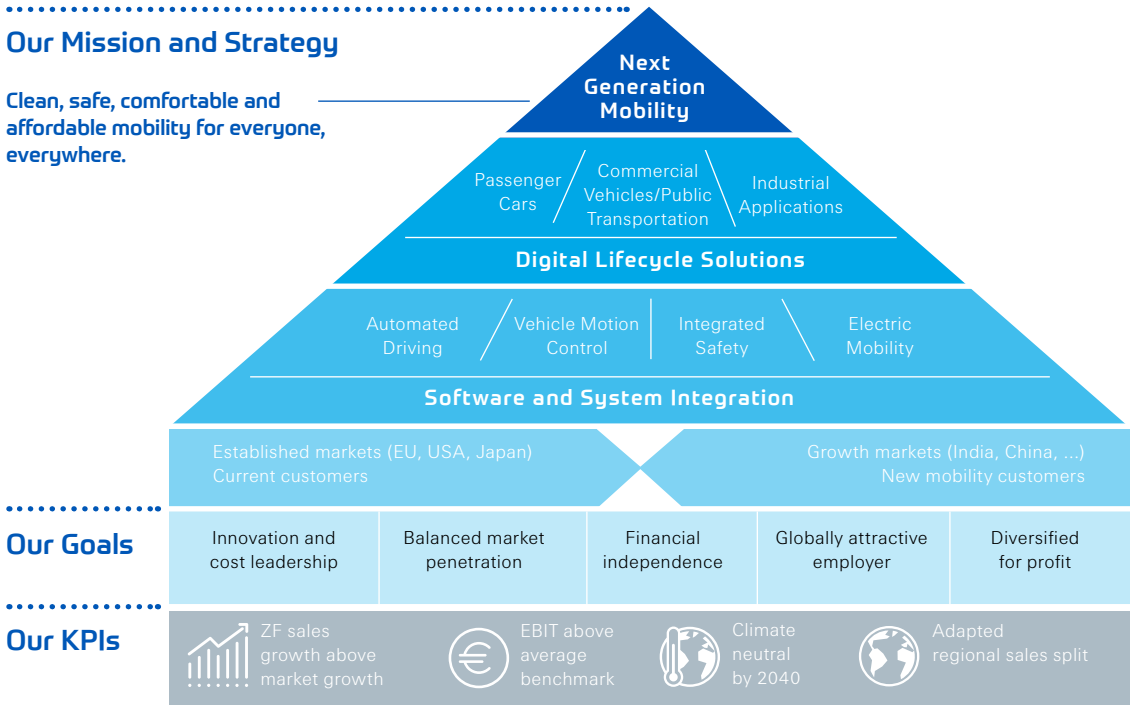
2. **Balanced market penetration:** Customer orientation is our focus and we are where our customers are – worldwide. Our aim is a balanced presence in all markets. Alongside Europe and the USA, we are focusing our attention particularly on regions with further growth potential: China and India. There, we reach new customers from the mobility sector who opt for ZF to accelerate their market rollout.

3. **Financial independence:** We aim to make our business decisions from a position of financial stability at all times. Financial independence is the foundation we build on to further increase our company value and meet the economic interests of our owners. To secure them, we engage in active financial management. Its purpose is to ensure that the balance sheet structure data remains within our target framework and that the free cash flow gives us leeway for action to implement our projects in operations.

4. **Globally attractive employer:** We want to ensure that the best employees are in the right place at the right time. We promote leadership quality, diversity and team culture. The ZF Way is our action maxim with the principles of anticipation, passion, diversity, empowerment and accountability. Therefore, we are using various dialogue measures to improve the feedback culture. Along the lines of "team beats silo", our cooperation goes beyond department and division boundaries.

5. **Diversified for profit:** We develop our service portfolio decentrally from the business units. This means that we not only stay close to our respective customers, but can monitor the markets individually for new business opportunities and tailor our solutions to market and customer needs. Active portfolio management is an important key to achieving these goals. Against the backdrop of the challenges expected above all in the first half of 2023, we will further adapt our technology portfolio. Diversification provides our company with stability and makes it easier for us to deal with temporary market fluctuations. At the same time, we take action to set up new business models in the area of software and service, e.g., for new mobility solutions.

Our Next Generation Mobility strategy



Report of the Supervisory Board

DR. HEINRICH HIESINGER

Dear Reader,

In early 2022, we were hoping with good reason that the effects of the Covid-19 pandemic and the scarcity of semiconductors would be alleviated and that growth in our markets would gain momentum once more. February 24, 2022, Russia's invasion of Ukraine, suddenly catapulted us into another almost unimaginable reality. The aftermath and hardship faced by the people in Ukraine are difficult to imagine despite the daily images in the media. The war also has huge implications for the rest of the world, especially Europe. Raw materials, energy and many foodstuffs are in short supply, feeding through into unprecedented price increases and soaring inflation. The higher costs affecting virtually all spheres of the population place a huge strain on finances, with a foreseeable slump in demand and the potential of a recession. Furthermore, the supply of gas and other energy sources remains precarious and prices have hit exorbitant levels.

ZF responded quickly and consistently to the worsening situation affecting several crisis areas simultaneously and managed to limit the negative effects on the company. Production was kept running almost continuously. The high additional costs due to inflation, which ran into billions for ZF, were largely offset by difficult price negotiations with our customers – coupled with our own cost savings. We are confident that buoyant incoming orders place us in a good starting point for the coming year. We managed to limit the repercussions of all these crises not least through our workforce's dedication, the prudent and consistent leadership by the Board of Management and the management team, as well as by intensive and constructive cooperation between the Board of Management and the Supervisory Board.

Looking to the future, ZF successfully placed numerous new products on the market, such as the Electric Vehicle Drive (eVD), and gained initial volume production orders for its high-performance computer ProAI or the connectivity unit ProConnect. In summer, ZF presented the industry's largest range of by-wire technologies and secured its first steer-by-wire order in Asia. ZF continues to consistently implement its transformation path in the areas of electric mobility, software and autonomous driving, anchored in ZF's Next Generation Mobility strategy.

Sustainability and climate neutrality dominate the public debate – With its "Acting now." program, ZF initiated a comprehensive project to achieve climate neutrality by 2040. Important milestones are the certification of the climate targets by the Science Based Targets Initiative, the conclusion of a long-term supply contract for green steel and the participation as the first Tier 1 supplier in the "Polestar 0" project with the aim of producing a completely climate-neutral vehicle by 2030. The capital market also rewards these measures. This enabled the placement of a sustainable bonded loan worth €700 million linked to ESG criteria. From fiscal year 2023, long-term variable remuneration will also include ESG targets.

Last year brought the following personnel changes in the Supervisory Board: Dr. Heinrich Hiesinger took office as Chairman of the Supervisory Board on January 1, 2022. Mr. Klaus Helmrich was also appointed as a member of the Supervisory Board on January 1, 2022.

We mourn our long-standing member of the Supervisory Board, Dr. Joachim Meinecke, who died on January 25, 2023. Our sympathy goes to his family and we will honor his memory.

In fiscal year 2022, the Supervisory Board performed the duties as required by the law, our articles of association and code of procedure duly and with great diligence. It continuously monitored the work of the Board of Management and provided advice in the management and strategic further development of the company. The Board of Management promptly and directly involved the Supervisory Board in all issues and decisions of fundamental significance. The Chairman of the Supervisory Board also liaised regularly with the Board of Management, especially the Chief Executive Officer, and received regular reports from him about current and important developments in the Group, also outside of committee meetings.

At the end of 2022, as in previous years, the Supervisory Board carried out a self-evaluation with the aim of further optimizing cooperation and efficiency in its own activities. The members provided valuable feedback and suggestions for the further development of committee work, which will be taken up in the new year.

In 2022, the Supervisory Board met for four regular meetings during which the Board of Management duly reported on business performance and all relevant current and strategically important issues. The Supervisory Board also held two extraordinary meetings.

In its regular meetings, the Supervisory Board extensively discussed with the Board of Management the company's situation, the development of the major sales markets, the sourcing markets, the general political conditions as well as the key financial figures.

The reports on the business situation regularly featured the status of the numerous market challenges and measures taken, such as on the gas supply at the European locations or the status of measures to offset inflation through price negotiations and cost reductions. Furthermore, the Supervisory Board was informed about location decisions, such as the new plant in Niederzissen in the district of Ahrweiler (Germany).

Further focus areas in the Supervisory Board meetings were in-depth reports relating to sustainability, HR and technology strategy as well as a status report on the Transformation Collective Agreement. In addition, regular further training measures for all Supervisory Board members on technological and regulatory issues were introduced as an additional element in 2022 and implemented over the short term in July on an additional information day focusing on "Market trends, profitability analysis from a customer perspective, and alternative driveline technologies for commercial vehicles".

As part of the Group-wide enterprise risk management, the Board of Management reported regularly to the Audit Committee and the Supervisory Board on the main opportunities and risks identified. When analyzing the overall picture of significant risks and opportunities, no risks can be identified which could jeopardize the company's continued existence, either alone or in combination with other risks. Furthermore, the Board of Management reported duly on the effectiveness and further development of the Compliance Management System.

The selection of suitable successor candidates for the departing Board members proved particularly relevant. To this end, two additional meetings were convened in the summer of 2022. An HR consultancy was called in to help with the internal and external search. At the end of the year, Chief Executive Officer Wolf-Henning Scheider, Chief Financial Officer Dr. Konstantin Sauer and Member of the Board of Management Mr. Wilhelm Rehm left the company. Dr. Holger Klein, member of the Board of Management since October 2018, was appointed as Chief Executive Officer as of January 1, 2023, Mr. Michael Frick has been supplementing the Board of Management since December 1, 2022, and succeeded Dr. Konstantin Sauer as CFO at the turn of the year. Dr. Peter Laier has joined the Board of Management as of January 1, 2023. In addition, the Supervisory Board regularly handled personnel decisions of top management.

In its regular meeting in December 2022, the Supervisory Board, after a thorough examination, approved the Group's operational planning after being informed in detail about the objectives at Group and division level.

In its four regular meetings and one extraordinary meeting in 2022, the Executive Committee advised in particular on the strategic alignment of the ZF Group, relevant legal issues as well as personnel matters.

The Audit Committee held four regular meetings in 2022. During its meeting on March 15, 2022, the appointed auditor reported in detail to the Audit Committee on the results of the 2021 annual financial statements and the consolidated financial statements, and discussed these with the Board of Management. In the July meeting, the committee discussed the 2022 semi-annual financial statements in detail. At the

meeting on December 14, 2022, preparations for the annual financial statements 2022 were discussed. A key element of the Board's work in all the meetings is the Group's corporate governance. To this end, the persons responsible for the four core disciplines Enterprise Risk Management, Internal Control System, Compliance and Corporate Audit presented an integrated Governance, Risk and Compliance (GRC) Report with detailed reports, including the respective implementation and effectiveness status of the measures initiated. Other key topics included preparation for the implementation of ESG reporting as well as detailed consideration of cybersecurity risks and measures.

The chairpersons of both committees, Dr. Heinrich Hiesinger and Mr. Axel Strotbek, reported in detail on the activities and essential issues in their committees at the subsequent Supervisory Board meetings.

The annual financial statements of ZF Friedrichshafen AG compiled by the Board of Management in accordance with the provisions of the German Commercial Code (HGB) and the consolidated financial statements compiled in accordance with Sec. 315e HGB on the basis of the International Financial Reporting Standards (IFRS), dated December 31, 2022, as well as the corresponding management reports, were audited by Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft. The company issued its unqualified audit opinion in each case.

The Supervisory Board extensively studied the documentation and examined it themselves; all members of the Supervisory Board had access to the audit reports in good time. The auditor explained the main audit results first to the Audit Committee and then to the Supervisory Board during the board meeting on March 15, 2023. In both cases, the results were discussed in detail. The Supervisory Board had no objections after its concluding audit result. During this board meeting, the appointed auditor's report as well as the annual financial statements of ZF Friedrichshafen AG were approved and the consolidated financial statements were adopted.

For fiscal year 2022, the Board of Management drew up a report on the relations to affiliated companies (dependent company report) according to Sec. 312 German Stock Corporation Act (AktG). After thorough review of the dependent company report, the Supervisory Board had no objections. Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft audited the report and issued the following audit opinion:

"Based on our dutiful audit and assessment, we confirm that

firstly, the actual statements of the report are correct; secondly, the contribution by the company with regard to the legal transactions presented in the report was not unreasonably high."

The Supervisory Board agrees to the audit results of the appointed auditor. According to its concluding audit result, it does not raise any objections with regard to the Board of Management's closing statement contained in the report.

Compared with its competitors, ZF performed very well in 2022, another year with particular challenges. The Supervisory Board expresses its gratitude to the Board of Management and all employees of the ZF Group who have made this possible thanks to their hard work and commitment.

Friedrichshafen, March 2023

On behalf of the Supervisory Board

DR. HEINRICH HIESINGER
Chairman of the Supervisory Board

Sustainability

Sustainability Strategy and Governance

KEY FACTS

- > Sustainability Council established to implement the strategy in core processes and business activities
- > Strategic sustainability targets linked to the long-term incentive of senior management
- > Successful placement of an ESG-linked bonded loan

"Acting now. Sustainability@ZF" is the overarching motto of all sustainability activities at ZF. The topics grouped in the three dimensions environment, social and governance were identified as material through the materiality analysis in 2021. The Board of Management confirmed these topics as still valid and essential in 2022. The company's material topics are regularly evaluated as a basis for sustainability reporting. This is preceded by an intensive analysis of three dimensions: the effects of the global challenges on ZF's business activities, the company's environmental and social impacts, as well as stakeholder expectations. The topics included in this report follow the materiality analysis from summer 2021. As a first step, essential issues of the industry, ESG requirements and the most important sustainability standards were evaluated for the analysis. On this basis, a list of topics was created and then evaluated and prioritized. In the context of internal expert interviews and workshops, the topics were considered from a business perspective, with a particular focus on discussing the strengths and weaknesses of ZF's current sustainability commitment and its business structure. An assessment from a stakeholder point of view was carried out by means of a series of interviews with representatives of customers, associations and NGOs. Based on the resulting insights, the Sustainability Steering Committee evaluated the impact of ZF's operating activities on the environment, employees and society. Combining these perspectives gave rise to topics for reporting and focus areas for further strategic development. The Board of Management thoroughly reviewed and confirmed the results of this analysis. They are also reflected in the focal points of the sustainability strategy "Acting now. Sustainability@ZF".

Acting for climate and nature

To reach our long-term objective of achieving climate neutrality by 2040, acting for climate and nature remains a major task. Two important levers for climate protection are the reduction of CO_2e emissions by all possible means at ZF and its suppliers and the increase of renewable sources for the electricity consumed. Other main levers for protecting climate and nature are fostering the concept of circular economy and improving our carbon footprint by further electrifying our portfolio wherever this is feasible.

Acting for all people

ZF considers all employees as equal in terms of gender, age, cultural background and similar characteristics. Cooperation within ZF is guided by equal rights and respect, and by equal opportunities for personal development. The best possible health and occupational safety has top priority throughout the company. We feel obligated to demand compliance with human rights for our company but also along the entire value chain, for example from our suppliers, and to ensure fairness in their working conditions and payment. In addition, ZF promotes cooperation with charitable and non-profit organizations for the benefit of local communities and society.

Acting for lasting values

In order to create lasting values, our business conduct – both on our own and in reliable partnerships – is transparent as well as ethically and legally sound at all levels. Our Code of Conduct serves as a compass for this. It is not short-term profit that counts but the creation of sustainable, lasting corporate values. To this end, we create and constantly optimize stable and efficient structures within the company.

For all material topics we consistently develop strategies, implement measures and monitor the progress over time. Following this approach, the sustainability strategy will be further elaborated and implemented during 2023. To integrate the strategy into the daily business, sustainability is not only integrated into core processes but the overall organization of the Group.

RESPONSIBILITIES AND ORGANIZATION

The Sustainability Department reports to the member of the Board of Management in charge of Human Resources, Sustainability, Legal and Compliance. In the year under review, the implementation of a multi-level sustainability organization was continued across all divisions, regions and major domain functions. The Sustainability Department is responsible for the development of the Group-wide sustainability strategy and for non-financial reporting. It also represents the contact point for any questions about sustainability and steers the stakeholder dialogue. In addition, the department also assumes the responsibility for individual topics, such as the climate strategy or human rights due diligence. In the coordination of sustainability topics within the company, the Sustainability Department has been supported by a cross-functional steering committee.

This steering committee will be replaced by the Sustainability Steering Board during 2023. The body will mirror a balanced representation of the senior management from ZF divisions, regions and functions to better reflect societal developments and stakeholder requirements. It will be responsible for driving the strategic development within ZF and the following tasks:

- Supporting the Board of Management in monitoring relevant sustainability and corporate social responsibility aspects
- Regular reviews of the effectiveness of the sustainability strategy and of agreed targets and measures
- Ensuring that the sustainability strategy is anchored in relevant processes and structures of the company
- Regular reviews of key topics

To implement the strategy in core processes and business activities, a Sustainability Council will be established. Here it will mainly be the Sustainability Leads of the corporate organization and the divisions who drive the implementation of the strategy and monitor progress. The council will be able to establish topic-related working groups, campaigns and projects for the specific processing of further issues. For example, a human rights working group provides regular consultations on topics related to the human rights compliance management system (HRCMS) and its further development, within the scope of human rights risk management.

In the year under review, the Sustainability Ambition Project further pursued internal and external sustainability tasks. The goal is to further develop the sustainability strategy for ZF and derive goals. Priority was given to the topic of climate. The effective cross-functional, regional and divisional structures of the project workstreams evolved to be passed over in 2023 into the existing line organization as described above and proven core processes such as strategic planning, central product development, enterprise risk management, internal control system and compliance management for human rights incidents. Furthermore, an interdisciplinary project group revised the process framework for product development, the so-called Global Development and Product Evolution Process (GDPEP), to implement sustainability requirements and a Product Carbon Footprint (PCF) calculation process in the existing product development process.

Monitoring progress of ZF's sustainability strategy will be supported by audits of ZF locations based on the approach of the Responsible Supply Chain Initiative e.V. (RSCI), which ZF became a member of in 2022. It was launched by the German Automotive Industry association (VDA) together with 14 other founding members to support all players in the automotive sector in advancing sustainability along their supply chains. For more information about procurement management, refer to the Supply chain chapter.

GUIDING POLICIES

Sustainability is anchored in the ZF Group directives and work instructions, making sustainable actions a key aspect of all business activities and day-to-day decision-making. The main pillars of ZF's sustainability management are the Principles of Social Responsibility, the environmental policy, the Respect for Human Rights policy statement, the Code of Conduct and our Business Partner Principles. The Code of Conduct, ZF's central policy when it comes to acting for integrity and sustainability in all its dimensions, is required to be acknowledged by all employees. Adherence to the Code of Conduct is a must. Detailed information on the Code of Conduct and the Business Partner Principles, their implementation and linked measures are to be found in the compliance section. These guidelines comply with the applicable principles and conventions, such as the Principles of the UN Global Compact and recognized international labor and social standards such as ILO and OECD Guidelines. Further policies with emphasis on human rights, but also on other sustainability aspects such as circularity or climate, are currently being developed and are planned to take effect as of 2023.

STAKEHOLDER COMMUNICATION AND MANAGEMENT

Striving for sustainability requires holistic thinking. ZF therefore engages with diverse interest groups to consider unique insights and feedback to arrive at balanced solutions. The most important stakeholders are employees, customers and suppliers, the company owners, investors, authorities, trade unions, associations and politicians. The media, business partners and residents at the company locations are also included.

ZF is convinced that cooperation is the key to successful sustainable development and therefore contributes to this by sharing knowledge with stakeholders and cooperating to develop solutions.

Stakeholder communication channels

Stakeholder groups	Media and formats
Employees	Zoom (intranet including various news channels and the sustainability-specific chatbot TERRA, blogs from the CEO, CHRO and other members of the Board of Management), face-to-face and virtual town hall meetings, webinars, skip-level meetings, innovation challenges, pitch events and virtual marketplaces, team communities, ZF BarCamp, New Work, management calls and internal target group mailings, notices, poster campaigns and on-screen information at the plants, family days, ZF website, social media and ZF hilft e.V.
Potential employees and educational institutions	Collaborations with universities and schools, Combined Annual and Sustainability Report, advertisements, ZF website, participation in trade fairs, events, sponsoring, social media and – in the future – employee ambassadors
Customers including end customers	Combined Annual and Sustainability Report, ZF website, brochures, advertisements, face-to-face or virtual customer days, participation in trade fairs, key account management, social media
Suppliers and partners	Combined Annual and Sustainability Report, ZF website, participation in trade fairs, advertisements, supplier days, key purchasing strategy, ZF Global Supplier Summit, social media, webinars
Politicians, associations, interest groups	Combined Annual and Sustainability Report, ZF website, Associations & Politics Department: topic-related discussions, round-table events/webinars, on-site visits, association work, social media
Press and other media	Combined Annual and Sustainability Report, ZF website, press releases, face-to-face and virtual press conferences, on-site and virtual test drives, social media
Communities	Press, ZF website, advertisements, sponsoring, social commitment at the locations, regional events, social media
Investors, analysts and other capital market participants	Combined Annual and Sustainability Report, annual and semi-annual conference calls with analysts and investors, capital market days, face-to-face meetings, trade fairs, ZF IR website

FINANCING SUSTAINABILITY

In the context of the EU strategy for financing sustainable growth (sustainable finance), financial institutions and credit rating agencies are calling for greater transparency and Environment, Social, Governance (ESG) commitment. As investors aim to reduce investment risks linked to sustainability issues, access to capital will increasingly depend on a company's ability to implement successful sustainability management. ZF has responded to this with its climate strategy, the **Green Finance Framework (GFF)** and extended sustainability reporting. ZF is also preparing for the upcoming requirements of the EU taxonomy in order to be able to classify investments and revenues according to sustainability criteria.

Considering the EU taxonomy enables ZF to use new financing opportunities for projects that contribute to lower emissions and a more climate-friendly economy. The framework takes the Sustainable Development Goals into account and follows the ICMA Green Bond Principles and the LMA Green Loan Principles. ZF will further develop the GFF in accordance with evolving market standards, the establishment of the EU taxonomy and the European green bond standard. Transparent information about the allocated proceeds and the climate effects of the financed projects is communicated in the annual Green Finance Report.

Having issued two green bonds in 2021, ZF extended its sustainable finance portfolio and linked a Revolving Credit Facility (RCF) to its sustainability goal of reducing CO_2e emissions in all three scopes of greenhouse gas emissions to achieve climate neutrality by 2040. In September 2022, ZF successfully placed an ESG-linked bonded loan, for which the repayment amount depends on the performance of the ZF's EcoVadis rating. The proceeds are used for the development, production and sale of products for battery electric vehicles (clean transportation) and for the development, production and sale of gearboxes for wind turbines (renewable energy). With our broad approach to sustainable financing instruments, we are well-positioned to meet the needs and requirements of ZF's Next Generation Mobility strategy and address the capital market in a contemporary manner.

SUPPORTED INITIATIVES

ZF committed itself to acting in a socially responsible manner by signing the United Nations Global Compact in 2012. Since joining, ZF has also become a member of the Global Compact Network Germany and actively participates in exchanges between the member companies. The ZF Group therefore acknowledges the core labor standards of the International Labor Organization (ILO), the contents of the German Corporate Governance Code (DCGK), the OECD Guidelines for Multinational Enterprises, the Universal Declaration of Human Rights and the UN Guiding Principles on Business and Human Rights.

During 2022, climate protection continued to be a major issue but respect for human rights moved into the center of attention. With the upcoming German Supply Chain Act (LkSG) in mind, which will apply to ZF as of 2023, companies further implemented requirements regarding the protection of human rights. As an active member of the Automotive Industry Dialogue, a multi-stakeholder dialogue in the context of the National Action Plan on Business and Human Rights (NAP), ZF participates in measures and campaigns to help companies improve their compliance with human rights due diligence obligations along their supply and value chains. In 2022, first manuals were published by the Federal Office for Economic Affairs and Export Control (BAFA). A document, which was developed with support from ZF, gives guidance on how to carry out a risk analysis within the meaning of the Supply Chain Due Diligence Act of July 16, 2021.

On top of this, ZF participates in other local and international campaigns and dialogues in the field of sustainability, such as the Sustainability Dialogue of the Zeppelin University and the European Association of Automotive Suppliers (CLEPA). ZF is member of the CLEPA Energy and Environment Working Group. Furthermore, in the CLEPA Task Force for Taxonomy & CSDDD (Corporate Sustainability Due Diligence Directive) ZF works together with other members to further the evolution of the taxonomy legislation to fairly consider the needs and possibilities of the supplier industry.

In order to underline its commitment to climate protection, ZF is a member of the Alliance of CEO Climate Leaders of the World Economic Forum. This alliance takes the stand that the private sector must assume responsibility and actively engage in efforts to reduce greenhouse gas emissions, thereby helping to shape the global transition to a low-carbon, climate-

resilient economy. Furthermore, ZF is a founding member and active partner of the World Economic Forum's First Movers Coalition (FMC). It aims to jumpstart the demand for zero-emission technologies by leveraging collective purchasing power from companies, thereby scaling up critical emerging technologies essential for this net-zero transition.

ZF is an expert member of the cross-industry Value Balancing Alliance (VBA). It aims to develop a standard for measuring and evaluating a company's impact on society, the economy and the environment. This way, it will be possible to consider aspects such as how many jobs ZF's business model created or how much CO_2e has been emitted which is speeding up climate change and endangering the livelihood of the same people. The methodology developed translates these impacts into comparable financial data. VBA members test potential methods for applicability and relevance to their business. During the reporting year, ZF joined a pilot project to test the current methodological stage, systematically recording impacts and sharing data with VBA members. Finally, it will be possible to compare the contribution of companies regarding even relatively soft aspects of sustainability.

MEMBERSHIPS IN ASSOCIATIONS

ZF and its companies are active in various associations and interest groups, including a wide range of sustainability-focused ones. The following list provides a representative selection:

- Association of German Transport Companies (Verband Deutscher Verkehrsunternehmen (VDV))
- Automotive Industry Action Group (AIAG)
- Catena-X
- eFuel Alliance
- Employers' Association Südwestmetall
- European Association of Automotive Suppliers (CLEPA)
- First Movers Coalition of the WEF
- German Association for Supply Chain Management, Procurement and Logistics (Bundesverband Materialwirtschaft, Einkauf und Logistik e.V. (BME))
- German Digital Industry Association (Bundesverband Digitale Wirtschaft (Bitkom e.V.)
- German Diversity Charter (Charta der Vielfalt e.V.)
- German Federation for Motor Trades and Repairs (Zentralverband Deutsches Kraftfahrzeuggewerbe e.V. (ZDK))
- German Association of the Automotive Industry (Verband der Automobilindustrie e. V. (VDA))
- German Mechanical Engineering Association (Verband Deutscher Maschinen- und Anlagenbau e. V. (VDMA))
- Global Compact Network Germany (DGCN)
- Mexican National Auto Parts Industry (INA)
- Mobility as a Service (MaaS) Alliance, participation in the Users and Rules working group
- Netzwerk Compliance e.V.
- Original Equipment Suppliers Association (OESA)
- Responsible Supply Chain Initiative e.V. (RSCI)
- Value Balancing Alliance (VBA)
- WindEurope

Climate and Nature

KEY FACTS

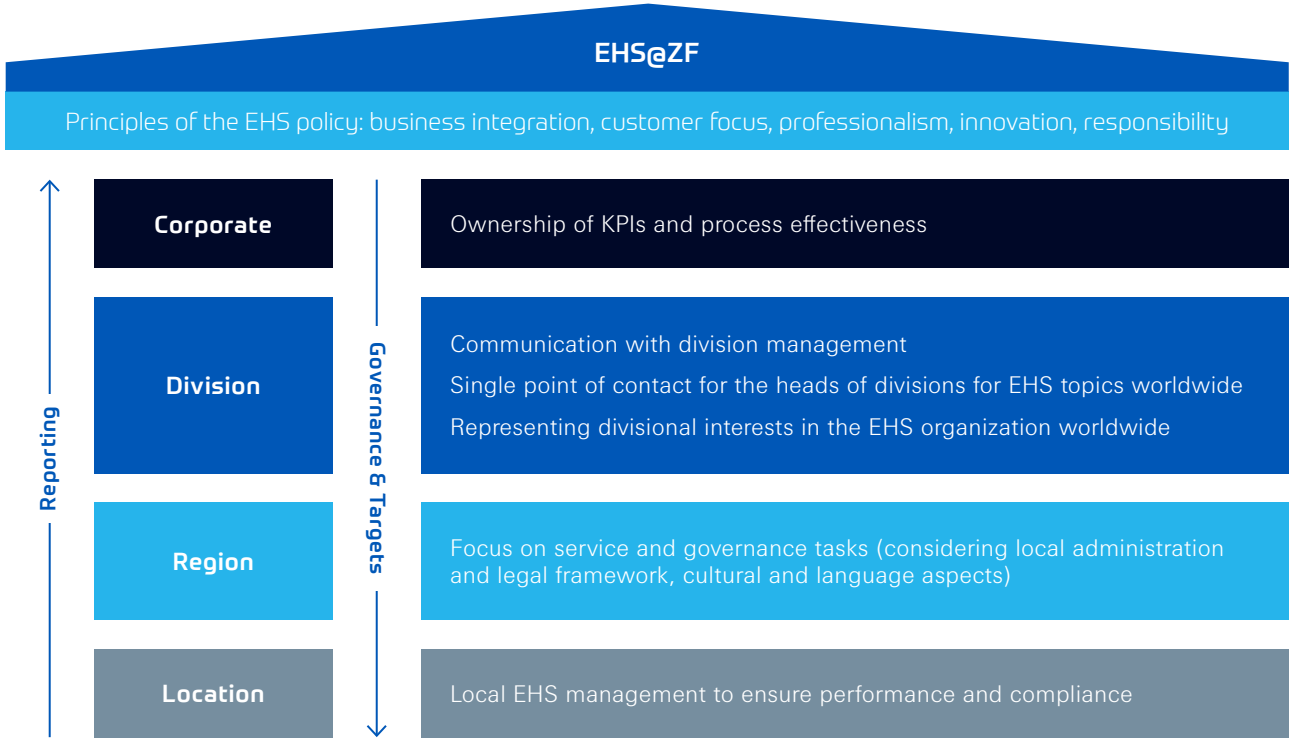
- > SBTi validation of CO_2e reduction targets
- > Launch of the "Green Materials" program to further improve ZF's materials CO_2e footprint
- > Strategic ZF Circularity Framework developed

Mobility is an essential element of modern life. At the same time, automotive suppliers carry a particular responsibility because production consumes extensive resources and emissions cause substantial changes to the climate worldwide. Therefore, we follow an ambitious climate strategy: to become climate neutral across all emission categories by 2040. At the same time, we pursue the vision of a circular economy, keeping valuable raw materials and resources in the economic cycle. This approach not only reduces resource consumption, emissions and waste volumes, but also lowers material costs.

RESPONSIBILITIES AND GOVERNANCE

The global ZF environmental organization covers all divisions, regions and individual locations. The Corporate Environmental Protection Officer is responsible at Group level, with senior environmental protection officers appointed at divisional level. At plant level, environmental, health and safety officers work on securing environmental protection day by day. Regional managers provide support for ensuring compliance with requirements in their respective regions, implementation of ZF standards and monitoring of the environmental management system.

Environment, health and safety organization



Systematic environmental management according to ISO 14001:2015 is the standard for all production and main development locations. External expert audits confirm that participating locations conform to current environmental and occupational health and safety legislation as well as to certification standards.

The Board of Management assesses the locations' target achievement in management reviews twice a year. It also evaluates whether the environmental management system is adequate for fulfilling current customer and management requirements from a legal standpoint.

GUIDING POLICIES AND PRINCIPLES

Conserving natural resources and reducing the ecological footprint of the company are fundamental principles of ZF's environmental strategy. The corresponding environmental policy therefore includes essential areas of activity such as climate protection, the environmental impact of production, eco-friendly product design and the improvement of environmental performance. The policy is binding for all locations and comprises specific targets for water, emissions and waste reduction.

Additionally, compliance with legal and regulatory requirements is the basis of all environment, health and safety (EHS) activities. ZF has implemented group-wide, integrated EHS standards in its EHS management system, which contains detailed stipulations for strengthening relevant processes throughout the company. The objective is to meet or exceed customer requirements while at the same time preventing EHS risks. Due to various local requirements, legal developments are monitored and evaluated and – where necessary – measures are implemented at all locations and levels of the ZF Group. Compliance-relevant processes as well as incidents and violations must be reported. For more information, please refer to the ↘ **Business conduct** chapter.

All locations follow the "prevention before reaction" and precautionary principle. A core element of ZF's EHS management system is therefore the evaluation and minimization of potential risks. All locations regularly conduct assessments of environmental aspects and risk for their respective facilities and processes in a local context – for example, prior to introducing new procedures or substances. To minimize liability and financial risks, environmental due diligence is also conducted as part of acquisition processes, along with internal and external audits.

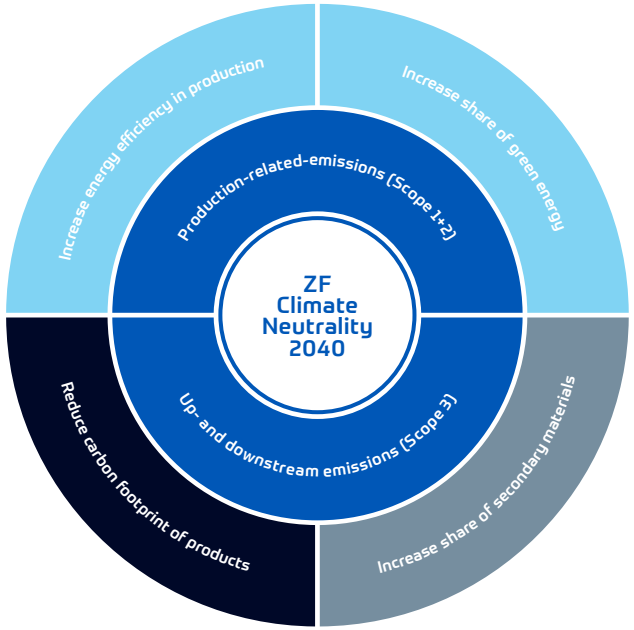
In order to be prepared for emergencies, each location has an emergency organization plan in place. Emergency response teams are provided with all the necessary equipment and procedures. Mock emergency drills are carried out on a regular basis. Technical installations, e.g., flood or fire protection, collection trays and redundant installations, are company standard, as are behavior-based measures for increasing employee awareness to prevent environmental damage.

ADDRESSING CLIMATE CHANGE

For the categorization of direct and indirect sources of emissions, the Greenhouse Gas (GHG) Protocol sets an international standard. ZF addresses all three scopes of GHG emissions: Scope 1 includes direct emissions resulting from the combustion of fossil fuels in ZF's own production and Scope 2 involves emissions from purchased energy, e.g., electricity and district heat. Scope 3 accounts for indirect emissions generated by purchased goods ("upstream") and emissions generated by ZF products in the utilization phase ("downstream"). These emissions cannot be directly influenced by the Group. In addition to managing CO_2 emissions, ZF is also tackling nitrous oxide (N2O) and methane (CH4) which occur in smaller quantities than CO_2 but which are much more harmful in the atmosphere.

The core of ZF's climate strategy is the commitment to reduce its corporate carbon footprint until 2030 by an absolute figure of 80% regarding Scope 1 and Scope 2 and by 40% relative to sales regarding Scope 3. Our ambition is to achieve net zero emissions in all three scopes by 2040. As for Scope 1 and Scope 2 emissions, the climate strategy focuses on reduction and substitution. Energy efficiency and avoidance of energy consumption are the given priorities. A secondary fo-

Climate strategy and implementation (Scope 1, 2 and 3)



cus is the transformation of energy consumption from fossil fuels to renewable sources, or a corresponding technology switch. Regarding Scope 3 emissions, the strategy focuses on improving product design, material selection, electrification and supply chain structures. To support target achievement, the Supervisory Board decided together with the Board of Management to link the reduction of Scope 1 and Scope 2 emissions as an indicator for the long-term incentive of ZF's senior management from 2023 onwards.

The Group's target path towards climate neutrality is defined considering the UN Sustainable Development Goals (SDGs), and in accordance with the require-

ZF climate targets at a glance

- ZF undertakes to reduce its absolute Scope 1 and 2 GHG emissions by 80% by 2030, with 2019 as the base year.
- ZF undertakes to reduce its Scope 3 GHG emissions by 40% per million euro sales by 2030, with 2019 as the base year.
- ZF undertakes to increase its annual procurement of electricity from renewable energies from 10% in 2019 to 100% by 2030.

ments of the Science Based Targets initiative (SBTi), the CDP (formerly the Carbon Disclosure Program) and the Taskforce on Climate-related Financial Disclosures (TCFD). The SBTi validation of the ZF climate goals ensures that these are consistent and robust and comply with the GHG Protocol and the targets of the Paris Agreement. In January 2022, as an independent body, the SBTi confirmed that the targets for reducing ZF's CO_2e emissions are planned in line with what the latest climate science deems necessary in order to achieve the objectives of the Paris Agreement.

ZF's ambitious reduction targets have been calculated on a scientific basis to ensure that global warming is limited to well below 2°C. According to scientific knowledge, the targets for reducing Greenhouse Gas (GHG) emissions from ZF's own plants (Scope 1 and 2) contribute to limiting global warming to 1.5°C. The ZF corporate carbon footprint (CCF) is calculated according to the GHG Protocol. Therefore, CH4 (methane) and N2O (nitrous oxide) are included in ZF's CCF and reported as CO_2 equivalents (CO_2e). HFCs and PFCs are excluded due to low materiality, but we expect these emissions to become more relevant because of our carbon emissions reduction of other GHG gases. NF_3 is not relevant as ZF does not produce solar cells or LCD screen technology; also, no SF6 emissions arise from ZF's operations.

ZF has been reporting climate data within the CDP reporting scheme on an annual basis since 2016. The data includes all greenhouse gas emissions listed by type and by country in which ZF operates. In 2022, ZF achieved a C rating in the category "Climate Change". Since CDP is widely aligned with the TCFD recommendations, information on climate change-related risks and opportunities, governance and management was reported. As part of its climate strategy, ZF is constantly refining its management approach and its corresponding reporting.

Risks and opportunities due to climate change

The worldwide consequences of global warming include more severe or frequent weather extremes such as floods, storms and droughts. Besides these so-called physical risks, transitional risks and opportunities also arise, e.g., higher costs of doing business, carbon price increases or fossil fuel demand reduction. A key development in the analysis of risks and opportunities for all companies is the intensified consideration of these climate change impacts. In this context, ZF follows the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) and takes the dimensions of governance, strategy, risk management as well as metrics and targets into account. The integration of the TCFD recommendations is performed in parallel with the further implementation of ZF's climate strategy.

As part of these efforts, ZF conducted a first scenario analysis for the Group in 2022 to assess the risks and opportunities due to climate change. The risk analyses are based on the two global warming scenarios 1.5°C and 2.7°C, and long-term projected (i.e., to 2030 and 2050). The implications of this analysis are currently being evaluated.

The integration of ESG and climate risk analyses into ZF's Governance, Risk & Compliance approach is under implementation and includes the Enterprise Risk Management and Internal Control System.

For more information regarding the adaptation of ZF's product portfolio to climate change-related impacts, please refer to the ↘ **Product development** chapter.

For more information about the general approach to risk management, please refer to the ↘ **Risks and opportunities** chapter of the Annual Report.

ENERGY MANAGEMENT

Sustainable energy consumption is a top priority for an industrial company such as ZF, and a core element within ZF's EHS management system. All locations regularly evaluate their energy profiles and energy-related activities. This includes conducting audits, identifying potentials for improvement and defining measures for increasing energy efficiency and reducing consumption. As an integral part of the company's energy management system, locations define specific local targets on an annual basis to increase energy efficiency and take appropriate action. In addition to ZF's EHS management, all German and European locations regularly undergo external audits based on country- specific standards such as EN 16247 or ESOS (UK) to meet the European Directive 2012/27/EU (Energy Efficiency Directive, EED).

In the course of ZF's Sustainability Ambition Project and the further development of its decarbonization strategy, all subgoals contributing to the reduction of CO_2e emissions were adjusted and updated. With regard to energy, the target is to reduce consumption related to ZF Group production by 20% by 2030 – relative to value added and compared to 2019. At Group level, ZF committed to increase the annual supply of electricity from renewable energy sources to 100% by 2030.

A cross-functional task force, under the leadership of the Operations Domain Function and with the participation of EHS and real estate management, works on increasing energy efficiency. The task force manages a corresponding program and reports to divisional production management and the Group. Target achievement and individual projects are monitored and controlled through KPIs within the environmental and energy management system in conformity with ISO 14001 and ISO 50001. By the end of 2022, 93 locations gained certification according to the international energy management standard ISO 50001.

To achieve decarbonization of its locations, ZF focuses on two main levers: Energy efficiency and the switch to green energy. ZF includes all production, administrative and research locations in its efficiency programs. Together with the energy purchasing department, a ZF Green Power Guidance Document has been developed that defines what ZF accepts as "green power". ZF focuses on technical green energy solutions that ensure genuine additionality. Particular attention is paid to the generation of electricity by wind turbines using ZF technologies.

In order to reduce energy consumption, detailed energy programs, such as the ZF Energy Basics, help the ZF locations to achieve their targets. Each location is expected to establish and maintain standards to improve employee awareness and to promote behavioral changes as well as standards for demand or peak-load management. For each aspect, a guidance document was added to the ZF EHS management system. Campaigns to increase efficiency and reduce energy consumption are planned and implemented at all locations, in accordance with the local levels of consumption and target achievement. These measures, in conjunction with the energy management system, considerably improve energy efficiency worldwide.

ENERGY FIGURES

Energy is mainly used for production processes, especially heat treatment, surface treatment and compressed air. Another significant area of energy use is associated with building and infrastructure management. This includes heating, lighting, air conditioning and ventilation. Furthermore, natural gas – and at one location, methane – is used at several locations in combined heat and power plants to generate electricity and heat for ZF's own facilities. Due to the variety of production processes within ZF, the share of energy use varies greatly among locations.

Based on measured overall consumption, 58% of the energy consumed at ZF comes from additionally purchased electricity. Energy procurement and consumption are therefore mainly characterized by the demand of ZF production locations. Natural gas accounts for 40% of ZF's energy consumption and is mainly used for heating and hardening processes and partially for on-site combined heat and power (CHP) plants. The remaining 7% comprises energy from diesel, gasoline, oil, district heating, liquid gas, acetylene and biogas. About 5% of the energy that ZF did not use for its own consumption was sold.

Renewables accounted for 23% of the total electricity (2021: 16%) in 2022 – under guaranteed certified green power contracts. This improvement is a result of the initiatives and contract amendments within the ZF Green Power Roadmap. By 2030, the purchased electricity shall be procured from purely renewable sources. The amount of self-generated electricity from renewable sources increased to 5,729 MWh due to new photovoltaic power plants installed in 2022 at several sites, e.g., in South Africa, Germany, Great Britain and Poland.

Compressed air plays an important role in industrial processes. Its production consumes a great deal of electricity and leakages in these compressed air systems can cause high energy losses. Therefore, ZF has implemented various projects to detect leakages and raise user awareness regarding the waste of compressed air. In 2022, our team in Sorocaba (Brazil) was able to reduce the plant's energy consumption by 2%. It is now refining its approach and aiming for a 3% reduction.

Ventilation systems provide a healthy and safe working environment, especially when extracting contaminated air. Our team in Passau (Germany) refurbished partly outdated systems to improve their energy efficiency. In doing so, as many parts as possible were reused from units taken out of service. Thus, ZF achieved improved air quality and an energy reduction of 75%.

To further reduce energy consumption for heat generation, ZF continues to recover heat from industrial and washing processes. These and other special programs and campaigns at location level have brought about a constant improvement in energy efficiency.

Overall, around 800 projects (2021: 555) were implemented or initiated in 2022, which led to more than 121 GWh in energy savings (2021: 86.4 GWh). This corresponds to the electricity consumption of 30,000 average households and an avoidance of 46,600 tons of CO_2e emissions.

Energy consumption

in MWh	2022	2021	2019 Baseline
Consumption of fuel	**1,867,542**	**2,004,531**	**1,954,370**
fuels from non-renewable sources [1]	1,866,923	2,004,381	1,954,370
thereof natural gas	1,721,067	1,871,999	1,850,571
fuels from renewable sources [2]	619	150	-
Consumption of purchased electricity	**2,477,129**	**2,562,763**	**2,558,830**
thereof from mixed sources [3]	1,906,518	2,162,229	2,295,835
thereof from renewable sources [4]	570,611	400,534	262,995
Consumption of self-generated electricity from renewable sources	**5,729**	**5,146**	**742**
Share of green power (%)	23	16	10

1) Natural gas, gasoline, diesel, fuel oil, liquified petroleum gas (LPG), compressed natural gas (CNG), acetylene, methanol
2) Biomass, biodiesel, bioethanol
3) Standard electricity mix from public grid
4) According to certified green power contracts

in MWh	2022	2021	2019 Baseline
Consumption of purchased heat	**169,403**	**197,903**	**161,241**
Energy sold	**–228,658**	**–269,698**	**–188,888**
Total energy consumption within the organization	**4,291,315**	**4,500,816**	**4,486,295**
thereof renewable sources	578,271	406,970	263,737
thereof non-renewable sources	3,713,044	4,093,846	4,222,558
Energy intensity			
Energy intensity (in MWh per € million of added value)	276	301	316
Reduction of energy consumption	**121,000**	**86,400**	**39,000**

EMISSION FIGURES

The intensity of ZF's GHG emissions results directly from the energy intensity and footprint of each country in which energy is purchased and used (location-based). In addition, the production footprint is strongly influenced by customer needs as well as national production and purchasing requirements (market-based).

Absolute direct emissions (Scope 1) decreased from 0.416 million tons in 2021 to 0.391 million tons in 2022. Absolute indirect emissions (Scope 2) fell from 0.941 million tons in 2021 to 0.776 million tons in 2022. The difference between market- and location-based emissions mainly results from the actual contractually creditable emission qualities.

With the ongoing reduction of CO_2 emissions as part of the climate neutrality strategy, the significance of other air emissions increases in proportion, although the absolute emission volume is not increasing. ZF is working on recording these emissions at Group level in order to identify further reduction potentials.

In accordance with the precautionary principle, ZF applies the Montreal Protocol for the protection of the ozone layer. ZF therefore uses small quantities of hydrofluorocarbons and, to a very limited extent, perfluorocarbons as alternatives to ozone-depleting substances. These are required, among other things, for refrigeration and air conditioning, firefighting or explosion protection. So far, all ZF locations manage these emissions at a local level in line with the ZF environmental management system and in accordance with local legal requirements. To ensure appropriate handling, ZF locations engage qualified contractors for the maintenance of the corresponding equipment. As these substances are used in closed systems, they are only climate-relevant in the event of possible leakages. The very small refill quantities required in such cases are currently not recorded at Group level.

Other emissions

in tons	2022	2021	2020
NOx	1,696	2,233	2,274
SOx	2,330	2,818	3,445

SUPPLY CHAIN DECARBONIZATION

Regarding procurement-related emissions, ZF's strategy is to make purchases, whenever feasible, in those regions where the materials or components are needed. ZF therefore follows the "local for local" principle, which helps to reduce the negative impacts of transportation. Of all production materials, 52% (2021: 51%) were procured locally. In this context, "local" means that the supplier is located in the same country as the receiving ZF location. As for non-production materials, 81% (2021: 83%) of the global spend excluding investments was sourced locally.

Achieving climate neutrality along the entire value chain by 2040 is one of the most ambitious targets because Scope 3 emissions are not within ZF's direct sphere of influence. Therefore, the contribution of our supply chain partners is key. After setting up a framework for decarbonization of the supply chain in 2021, during 2022 ZF focused on further developing this framework and on implementing the first decarbonization measures.

As renewable energy is the most important lever to achieving decarbonization of the supply chain, we developed the "ZF Supplier Guide and FAQ on Green Electricity". It contains definitions and ZF's expectations as well as various procurement options to obtain renewable energy. The guide is available to all suppliers in ZF's Supplier Business Portal. It has also been attached to the digital roadmap survey that ZF conducted during 2022, collecting feedback from more than 1,200 suppliers, who will be requested to update their renewable energy roadmaps on a yearly basis.

At the ZF Global Supplier Summit in November 2022, we communicated decarbonization expectations, which are part of ZF's new bid conditions. They are followed by specific measures to be achieved by the supplier base in 2023. A fundamental expectation is the goal of "100% renewable energy for all new sourcing decisions by 2025". Therefore, we focused on receiving renewable energy roadmaps from suppliers and introduced supplier product carbon footprints (PCF) in sourcing decisions. Other bid conditions include goals for recycled content, energy efficiency and further material-specific requirements.

Emissions in CO_2e

in million tons	2022	2021	2019 Baseline
Scope 1	**0.391**	**0.416**	**0.406**
Scope 2			
location-based	1.079	1.377	1.437
market-based	0.776	0.941	1.371
Total (Scope 1+2) [1]	**1.167**	**1.357**	**1.777**
1 Purchased goods and services	16.557	18.994	21.688
2 Capital goods	0.934	1.188	1.485
3 Fuel- and energy-related emissions (not included in Scope 1 or 2)	0.273	0.236	0.222
4 Upstream transportation and distribution	0.810	1.357	1.127
5 Waste	0.135	0.136	0.131
6 Business travel	0.039	0.021	0.113
7 Employee commuting	0.152	0.145	0.149
9 Downstream transportation and distribution	0.298	0.499	0.415
10 Processing of sold products	0.060	0.060	0.060
11 Utilization phase	63.372	68.935	77.235
– direct	4.563	3.906	8.414
– indirect	58.809	65.029	68.821
12 End-of-life treatment of sold products	0.110	0.094	0.071
15 Investments	0.004	0.007	0.022
Total (Scope 3)	**82.744**	**91.672**	**102.719**

1) The total quantity was calculated based on market-based emissions.

In order to maintain an overview of the numerous sustainability-relevant activities in the supply chain and to be able to manage measures appropriately, the function Supply Chain Sustainability is now reporting directly to the Head of Materials Management (MM). Also, additional headcounts have been assigned for the follow-up and coordination.

Additionally, it was decided to set up a MM Sustainability Committee to foster decision-making and communication on sustainability topics between the MM top management and other relevant internal stakeholders, i.e., the divisions, R&D and Corporate Sustainability. To strengthen the collaboration and communication on an operational level, a Sustainability Business Support (SBS) Organization was setup. The SBS experts, directly embedded in commodity and program purchasing, cover all commodities and divisions in order to share best-practices, drive sustainability topics and collaborate in sustainability projects with the supplier base.

Production materials

Regarding upstream emissions, aluminum and steel represent the largest share in the purchasing portfolio. An effective reduction of emissions can only be achieved through major technological innovations in the production of these raw materials, e.g., the production of steel in electric arc furnaces powered by renewable energy, the introduction of nitrogen technology in blast furnaces or the use of renewable energy for smelting aluminum.

To improve ZF's materials CO_2e footprint, the R&D Department launched the "Green Materials" program in 2022. Multiple expert groups were established, covering the most important raw materials for ZF. The project specifies new technologies for high-volume materials and validates these by developing demonstrator products. A key technology for achieving CO_2e reduction is the use of so-called green hydrogen in steel production. ZF has therefore concluded a purchasing agreement with H2 Green Steel. This Swedish start-up aims to accelerate the decarbonization of the steel industry with new production processes. As of 2025, ZF will receive 250,000 tons of "green steel" annually. This volume accounts for ca. 10% of ZF's current steel requirements and will save around 475,000 tons of CO_2 emissions.

To cover the entire materials management process, we completed implementing the ZF Materials Warehouse (ZFMW) in the reporting year. ZFMW supports the screening and classification of materials as non-approved, approved or preferred materials. In addition to enabling material release, ZFMW also makes it possible to select and change materials. Not only does early analysis of materials ensure compliance with technical standards and country-specific laws, it also provides the possibility of managing several material variants. At the same time, supplier management and material provision efforts are reduced to a manageable degree. A sustainability classification for the materials is currently being implemented, allowing material selection especially with regard to product development with a lower CO_2e footprint.

Emissions in the bidding process

Since January 2022, PCFs have been considered during the ZF sourcing process for production material. Suppliers have to provide PCF information for offered parts. The focus lies on upstream emissions, i.e., the emissions of the parts and services purchased. Suppliers' PCF data is automatically transferred to ZF's internal sourcing and awarding system. In 2022, ZF also introduced a CO_2e reporting tool for tracking and reporting PCF information. This way, lifecycle costs and PCF values are evaluated by the sourcing decision board. In 2023, the suppliers' PCF will become mandatory for cases of high-spend sourcing of production material.

In order to ensure uniform calculation and reliability of provided data, ZF has introduced the ZF PCF Calculation Method Supply Chain (based on ISO 14040, ISO 14044 and ISO 14067). Suppliers are to apply this method to calculate the PCFs of the parts that they provide to ZF. Since suppliers' PCFs are to become mandatory in 2023, ZF will intensify deep-dive training on PCF calculation for suppliers (and buyers) as well as on other sustainability requirements.

Training for suppliers and buyers

As part of a sustainability campaign in Materials Management, ZF-internal trainings were conducted towards the end of 2021 and early 2022. The purpose of these training sessions was to inform buyers about the importance of sustainability in the supply chain and about the upcoming changes in the sourcing process. During 2022, several deep-dive training sessions were conducted on topics such as renewable energy and the Scope 3.1 CCF calculation.

To support the rollout of sustainability in the supply chain and the PCF-enhanced sourcing process, ZF conducted multiple free-of-charge trainings for the supplier base. Two training modules were offered by the ZF Supplier Academy: One was a basic training module about ZF's climate action program, including the PCF-enhanced sourcing process and its impact on the suppliers; the other was a training module about the new ZF QAF 4.0, which includes a CO_2e section for suppliers to calculate their PCF values.

More deep-dive training sessions on sustainability topics will be offered in 2023. All training modules will be bundled in a sustainability curriculum and conducted by the ZF Supplier Academy, free of charge for our suppliers.

RESOURCE USE AND CIRCULAR ECONOMY

Closing material loops is one of ZF's key sustainability goals. Circular economy is a systematic approach to sustaining the value of products and materials for as long as possible. Increasing material efficiency and reducing volumes of waste ultimately lead to reduced raw material extraction and CO_2e emissions. If a product can no longer be used, repairing, reuse, remanufacturing of the product and recycling of materials close the loop.

Since there are many aspects to be considered when using this systemical approach, a holistic view is needed that covers the whole lifecycle of a product. ZF is therefore embedding circular economy within the organization through cross-functional collaboration. A first milestone is building knowledge and creating awareness for closing material cycles. In the reporting year, various training and awareness workshops took place with internal specialists from different functions throughout the organization. A second milestone was met during the reporting year with the development of the strategic ZF Circularity Framework, which comprises focus areas as well as circular economy metrics.

This concept will be further elaborated together with key stakeholders during 2023. According to the EU commission, 80% of a product-related environmental impact is determined in the design phase. Therefore, ZF continues improving the design phase by updating the sustainable product design standard. For more information, please refer to the **Standards and guiding policies** chapter.

While ZF is increasing its efforts in all areas of a circular economy, the Group has a long history of remanufacturing. Our aftermarket activities cover more than 250 product families supported at 25 remanufacturing locations in 15 countries. Products from Bielefeld (Germany), one of our leading remanufacturing locations, have already been certified in accordance with the cradle-to-cradle (C2C) standard. In order to achieve certification, aspects such as material health or re-utilization, renewable energy and carbon management, water stewardship, and social fairness need to be evaluated. To develop this approach, the ZF Group collaborates with various working groups and universities on energy-saving and environmental protection.

Monitoring prohibited and regulated substances is an important aspect not only of product compliance, but also of realizing circular economy, since the level of hazardousness of substances often also affects their reusability or the possibility of recycling. Here ZF applies its company standard ZFN 9003 "Control of Prohibited and Regulated Substances" and ZFN 9005 "Design for Sustainability" as well as international laws and regulations. These requirements are tracked for ZF's supply chain in order to ensure conformity. For more information, please refer to the **Guiding policies and principles** chapter.

MATERIALS AND WASTE

With raw materials increasing in scarcity and price, efficient use is becoming more and more crucial. At the same time, materials must conform not only to stringent quality and safety but also to environmental and social standards and regulations. For more information regarding environmental protection during product development, please refer to the **Product development** chapter.

Every year, the ZF Group purchases approximately 356,000 tons of aluminum and 2.78 million tons of steel including cast iron, not including directed buy volumes, for which ZF's customers define which sub-suppliers are to be subcontracted. In addition to raw materials, ZF also purchases large volumes of assembled parts and products that consist of a mixture of different materials. Therefore, figures on specific materials are not readily available. ZF also uses recycled materials in production. In terms of weight, long steel products and cast aluminum products constitute up to 90% of recycled materials.

ZF channels a high percentage of waste from production processes back into the external recycling processes. This mainly applies to scrap metal and metal chips, waste oil, paper and cardboard as well as wood and demolition waste. As a result of their material composition and design aspects, ZF products have a higher recycling rate, resulting in a disproportionately high contribution to meeting the recycling quotas stipulated in the EU End-of-Life Vehicles Directive.

ZF's environmental management system is aimed at continuously reducing the amount of waste generated. To support the circular economy and close material loops, ZF set itself a waste reduction target: Locations are expected to reduce waste for disposal relative to value added by 1% annually, with 2019 as the base year.

Waste

in tons	2022	2021 [1]	2020
Recycling	**523,461**	**533,850**	**457,768**
thereof non-hazardous	493,123	504,367	428,832
thereof hazardous	30,338	29,483	28,936
Disposal	**57,329**	**60,831**	**51,071**
thereof non-hazardous	31,376	35,666	25,553
thereof hazardous	25,953	25,165	25,518
Total	**580,790**	**594,681**	**508,839**

1) As of 2021 incl. the former WABCO locations

Reducing hazardous waste is a general goal in waste management. ZF therefore continues to work towards decreasing the volume of waste to be disposed of, as well as hazardous waste. For this purpose, the Group is changing processes, optimizing procedures and replacing hazardous substances used in operations. In order to avoid any transport risks, ZF does not export hazardous waste from one country to another and organizes waste disposal locally.

In 2022, the total amount of waste decreased by 2.3%. The specific waste amount, (tons per € million per added value) was again lower in 2022 than in the previous year. The recycling rate was 89%. In 2022, the company was involved in 62 projects for the remediation of contamination dating back at least a decade. These projects were carried out jointly with the relevant local authorities and cost more than €10.2 million (2021: €5.6 million).

WATER

ZF considers water withdrawal for production at all ZF locations a major environmental issue since the use of freshwater will become increasingly restricted in the future. Water is used in production, e.g., for surface treatment processes, washing, rinsing and cleaning, and as a coolant. It is also required for non-production purposes, such as sanitation and construction projects and as drinking water in the cafeteria. ZF is committed to installing water-saving equipment that exceeds statutory requirements.

Some of ZF's production locations, e.g., in Brazil, Mexico, India and China, are in areas with significant water scarcity or with significant water shortage. In these areas, permits for water withdrawal for production purposes are occasionally restricted. If water scarcity persists, this situation could worsen or affect further regions. This may result in a need for increased investment or expenses to cover the technical modernization of production equipment.

In 2020, ZF assessed all locations for their water risk using the WWF Water Risk Filter. An updated assessment of all locations is currently being prepared; it will be finished in 2023. 22 locations were identified as possibly being in high or medium water scarcity areas due to their geographical position. Nine of these plants were verified by means of the WWF questionnaire. The data of the production sites surveyed showed a water utilization profile of 1 to 2 (on a WWF scale up to 5). The Group has therefore set itself the target of reducing the intensity of water withdrawal at these sites by 2% per year as a matter of priority.

The Group's water management objective goes beyond reducing withdrawal in risk areas: The goal is to continuously reduce water withdrawal throughout the Group. The target is a water withdrawal reduction at ZF locations in areas where water scarcity determines public life of 2% annually relative to value added until 2025. For all other locations, a 1% reduction is being targeted on an annual basis. The base year for both targets is 2019. All water sources will be considered when assessing target achievement. Location-specific projects are focusing on water reuse and water conservation when it comes to the use of freshwater. Progress is monitored and managed in line with ZF's environmental management system at individual locations and at Group level.

As a result of increasing production in 2022, the amount of water discharge at ZF locations has also increased, which only takes place with the approval of authorities. To achieve the targets, ZF locations have adapted their water supply to local circumstances and use mainly untreated fresh water sources. At some locations, water from rivers or groundwater is used for cooling processes without any chemical treatment. In addition to the various projects aimed at reducing overall water withdrawal in production, ZF is modernizing water supply at locations by renewing piping or by monitoring concepts to quickly detect leakages. ZF also makes use of available water treatment and reuse technologies to reduce freshwater withdrawal, particularly with regard to sanitary water. The specific withdrawal significantly improved by 16% compared to 2019. The substantial increase in water withdrawals in water stress areas was caused in particular by construction work at the Mesa site (USA). Here, – in accordance with legal requirements – larger volumes were used on a once-only basis, e.g., for dust control.

Water

in m³	2022	2021	2020
Absolute water withdrawal	**9,687,209**	**9,770,000**	**9,170,000**
Ground water	853,062	840,000	760,000
Surface water	5,184,005	5,260,000	4,960,000
Water from third parties	3,650,142	3,670,000	3,450,000
Withdrawal in water-stress areas [1)]	**79,601**	**67,637**	**73,322**
Ground water	1,064	990	1,054
Surface water	0	0	0
Water from third parties	78,537	66,647	72,268
Water discharge	**8,314,945**	**8,310,000**	**7,920,000**
Surface water	4,861,286	4,990,000	4,670,000
Groundwater	0	0	0
Seawater	0	0	0
Third-party water	3,453,659	3,320,000	3,250,000
Total water consumption	**1,372,264**	**1,460,000**	**1,250,000**
thereof in water-stress areas [1)]	39,903	32,416	46,556

1) Excl. former WABCO locations

Relevant processes at ZF with the potential risk of releasing hazardous substances include surface treatment, machining with cooling lubricants and painting. Preventive technical measures in place at the locations ensure that hazardous substances cannot seep into the ground and endanger groundwater, even in the event of a release resulting from an incident. A Group-wide reporting obligation has been introduced to cover the eventuality of such a release. Wastewater loads are managed at local level, with relevant deviations from legal requirements and permits being reviewed at Group level through audits and management reviews. In the year under review, no significant environment-impacting spills were reported.

Thanks to the use of water treatment technologies, ZF not only decreases withdrawal of freshwater but also produces less wastewater. Production processes use recycled water for washing, rinsing and cleaning operations and for the application of cooling lubricants. Wastewater at ZF is usually discharged into the public sewer system after treatment at local wastewater plants. Direct drainage into surface water only occurs at a few locations where public infrastructure is lacking or where ZF is allowed to use the corresponding surface water for cooling purposes. In these cases, water is treated using state-of-the-art technology and is drained directly only with the approval of the authorities. Threshold values are strictly monitored by ZF and the authorities.

Our People

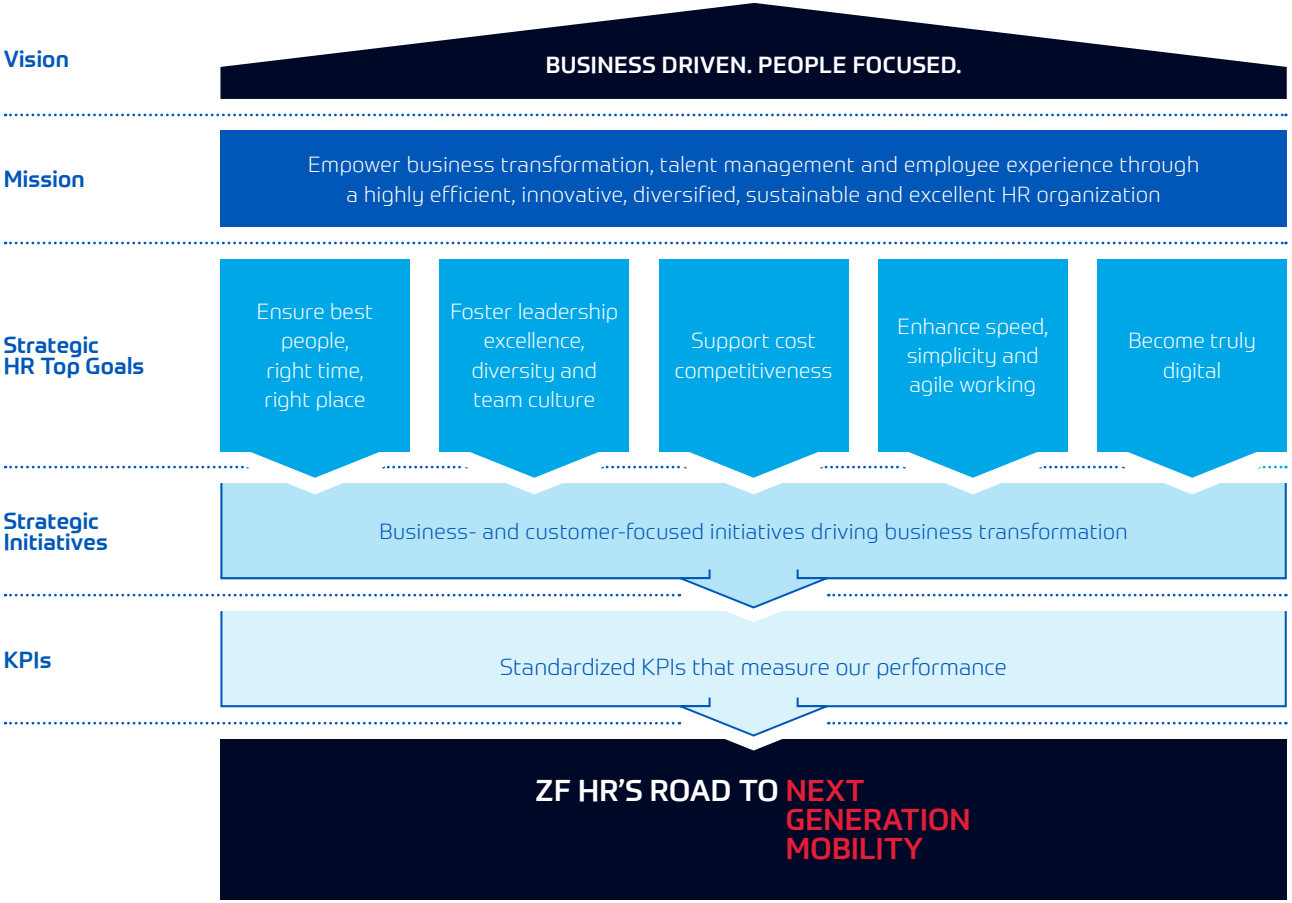
KEY FACTS

- Launch of "Empower, HerPower", aimed at increasing female representation within leadership functions
- German Human Resources Management Award in the category "Talent & Learning"
- Extension of the Annual Salary Review (ASR) process for managers and employees

Responsibility and commitment characterize what ZF wants to stand for as an employer. For this purpose, we live a corporate culture that strengthens cooperation, leadership and responsibility, and provides a working environment that rewards high performance and teamwork. At the same time, the company sees itself as a conscientious and supportive partner of its employees. Fairness means benefits for employees and employers alike. We are convinced that this approach promotes commitment and ultimately helps improve economic results.

Regarding our customers, the Group's Next Generation Mobility strategy aims at ensuring clean, safe, comfortable and affordable individual mobility – for everyone and everywhere. It is the answer to the current transformation of our industry.

HR Strategy



We rely on the openness and enthusiasm of our employees to actively shape the future of mobility. The HR strategy defines five objectives required in order to fill this vision with life:

- Ensure the best people at the right place at the right time
- Foster leadership excellence, diversity and team culture
- Support the Group's cost competitiveness
- Enhance speed, simplification and agile working
- Become truly digital

THE ZF WAY

In more than one hundred years of company history, ZF has developed a unique corporate culture. It is based on the entrepreneurial spirit of its founders and is highly innovation-oriented. The ZF Way offers orientation and a clear direction during an industry transformation that is more dynamic and, in certain areas, more fundamental than ever before. Its guiding principles describe how we want to lead and work together. They define the way we do things as an organization and express what the people at ZF stand for. The ZF Way is based on five proven and fundamental principles that helped ZF rise as a company and become a global leading mobility specialist: passion, anticipation, diversity, empowerment and accountability. While in 2021 the focus was on creating awareness of the ZF Way and its principles, in 2022 the ZF Way became part of the Group's everyday life. Thus, we have integrated the principles into the first corporate processes, for example the employee dialogues.

RELATIONS BETWEEN EMPLOYERS AND EMPLOYEES

ZF strives for respectful cooperation at all levels and attaches great importance to open communication among its employees. The company respects the right of its employees to join or support a labor union or works council, or refrain from doing so, consistent with applicable law. Under no circumstances may employees or employee representatives be subject to disadvantages because of their involvement.

In Germany in particular, trust-based cooperation under the Works Constitution Act is an integral part of our corporate culture. This applies to all employee representative bodies, such as members of the works council and committees, the European Works Council, the Group Works Council and the corresponding employer representatives. Employee representatives must be informed comprehensively about any changes in the company in good time, depending on the legal situation and related agreements. Legal and collective bargaining deadlines are always met. Important corporate development issues are discussed and communicated. Approximately 75% of all employees worldwide have employee representatives or are covered by collective agreements. Approximately 5% are managers whose working conditions exceed these collective agreements. Temporary workers or service providers are covered by their employers' collective agreements, under which they may be represented by employee representatives such as works councils. For more information about the participation of employee representatives in health and safety committees, please refer to the ↘ **Occupational safety and health** chapter.

EMPLOYMENT

As a company with a long-term strategy and a strong focus on people, ZF is committed to the permanent employment of its staff. At the same time, the number of employees must match the future product portfolio and future customer requirements to ensure that the company remains competitive. In addition to new hires and programs for further training, the Group relies on natural fluctuation, early retirement programs and the flexibility that external staff provides. Termination of existing employment relationships is regarded as a last resort.

To be more flexible and attract the required skilled talent, ZF also employs temporary workers. We make sure that their working conditions are appropriate and fair. For example, external employees are included in all regular employee communication activities, they are subject to the same rules for occupational safety and health, and have the same access to plant facilities such as cafeterias. Cooperation with recruitment agencies is regulated Group-wide by standardized supplier agreements, which include strict requirements in line with our Code of Conduct and our business ethics. Where recruitment fees apply, these are paid by the company and not by the candidate.

As of December 31, 2022, ZF employees worldwide numbered 164,869. By the end of 2022, ZF had hired a total of 40,676 new employees, of whom 14,417 were women, 26,249 were men and 10 were listed as diverse. Almost half of them were hired in North America (42.6%), followed by Europe (28.4%).

Employees by region [1]

	2022	2021 [3]	2020
Number of employees	**164,869**	**157,117**	**141,346**
Europe	93,706	92,393	86,832
thereof Germany	53,265	52,700	50,073
North America	35,307	34,027	30,767
South America	5,592	5,365	4,950
Asia-Pacific	29,454	24,736	18,209
Africa	810	596	588
Number of permanent employees [2]	**151,895**	**146,645**	**135,799**
Europe	88,695	-	-
thereof Germany	51,083	-	-
North America	33,613	-	-
South America	5,539	-	-
Asia-Pacific	23,300	-	-
Africa	748	-	-
Number of fixed-term employees [2]	**12,974**	**10,472**	**5,547**
Europe	5,011	-	-
thereof Germany	2,182	-	-
North America	1,694	-	-
South America	53	-	-
Asia-Pacific	6,154	-	-
Africa	62	-	-

	2022	2021 [3]	2020
Number of full-time employees [2]	**158,933**	**151,744**	**137,684**
Europe	89,191	-	-
thereof Germany	49,679	-	-
North America	33,903	-	-
South America	5,587	-	-
Asia-Pacific	29,442	-	-
Africa	810	-	-
Number of part-time employees [2]	**5,936**	**5,373**	**3,663**
Europe	4,515	-	-
thereof Germany	3,586	-	-
North America	1,404	-	-
South America	5	-	-
Asia-Pacific	12	-	-
Africa	0	-	-

1) Number of employees per headcount
2) Detailed data of previous years cannot be calculated
3) Without ZF Rane Automotive India Private Limited

New hires by gender, age and region

	2022	2021	2020
ZF Group	**40,676**	**29,145**	**12,512**
By gender [1]	**40,676**	**-**	**-**
Female	14,417	-	-
Male	26,249	-	-
Diverse / unknown	10	-	-
By age group [1]	**40,676**	**-**	**-**
Under 30 years	23,890	-	-
30–50 years	14,984	-	-
Over 50 years	1,802	-	-
By region	**40,676**	**29,145**	**12,512**
Europe	11,536	9,441	6,109
thereof Germany	4,129	1,505	1,621
North America	17,332	13,126	3,232
South America	1,031	768	350
Asia-Pacific	10,454	5,640	2,810
Africa	323	170	11

1) Data of previous years cannot be calculated

In the year under review, some 850 people started an apprenticeship or dual work-study program at ZF in Germany. By the end of 2022, our apprentices and students completing a dual work-study program numbered 2,343 worldwide. Apprentices can choose from 35 different apprentice professions and dual work-study courses. ZF Germany usually offers regular employment contracts to its apprentices. As a result, ZF hired around 668 former apprentices as new employees in 2022. More information on career opportunities at ZF is available at www.zf.com

Employees by contract

	2022	2021 [2]	2020
ZF Group			
Number of employees	**164,869**	**157,117**	**141,346**
Female	44,232	41,749	37,707
Male	120,312	115,352	104,049
Diverse / unknown	325	16	9
Number of permanent employees [1]	**151,895**	**146,645**	**135,799**
Female	40,904	-	-
Male	110,666	-	-
Diverse / unknown	325	-	-
Number of fixed-term employees [1]	**12,974**	**10,472**	**5,547**
Female	3,328	-	-
Male	9,646	-	-
Diverse / unknown	0	-	-
Number of full-time employees [1]	**158,933**	**151,744**	**137,684**
Female	40,427	-	-
Male	118,181	-	-
Diverse / unknown	325	-	-

	2022	2021 [2]	2020
Number of part-time employees [1]	**5,936**	**5,373**	**3,663**
Female	3,805	-	-
Male	2,131	-	-
Diverse / unknown	0	-	-
Number of apprentices, interns and external agency workers			
Apprentices	2,343	2,454	2,315
External agency workers	17,409	14,660	15,354
Interns	1,180	1,034	663

1) Detailed data of previous years cannot be calculated
2) Without ZF Rane Automotive India Private Limited

Employee turnover

in %	2022	2021	2020
ZF Group	**9.7**	**8.8**	**6.1**
By gender [1]			
Female	13.3	-	-
Male	8.3	-	-
Diverse / unknown	1.5	-	-
By age group [1]			
Under 30 years	23.1	-	-
30–50 years	8.2	-	-
Over 50 years	3.6	-	-
By region			
Europe	4.5	3.8	2.2
thereof Germany	1.9	1.9	1.2
North America	23.7	21.9	17.1
South America	4.5	3.0	1.3
Asia-Pacific	11.9	11.7	6.5
Africa	6.0	6.1	1.4

1) Data of previous years cannot be calculated

FAIR REMUNERATION

ZF uses special remuneration structures to make sure remuneration is fair and competitive throughout the Group. The remuneration of managers is based on a global job evaluation system and a benchmark of remuneration data compared to relevant markets. Below the management levels, remuneration is based either on collective agreements or local job classification systems and it is also benchmarked to local markets. Job evaluation, classification systems and collective agreements are intended to ensure fair treatment of employees, including gender pay equity.

ZF offers all managers a global short-term incentive (STI) to promote the company's power of innovation and foster employee commitment. The STI is based on financial performance indicators that aim to promote collaboration and alignment of all managers with the Group's strategic objectives. The process is transparent and defines a framework for metrics and priorities within the company.

All ZF employees with part-time, full-time, permanent or fixed-term employment contracts have access to benefit programs. These benefit programs are set up locally and follow local regulations and market practices. Health and insurance benefits play a key role here. Benefit programs for contract workers and agency-based temporary workers apply according to the type of contractual engagement the workers have with ZF and are subject to local regulations.

In 2022, the ZF Group pursued its goal of digital transformation by extending the globally harmonized and digital Annual Salary Review (ASR) process for managers and employees to 13 additional countries. This process applies to all employees whose remuneration is not based on a collective agreement. So far, it has been rolled out to include approximately 31,000 employees in 15 countries. The tool supports aspects of equal pay, equal opportunities and non-discrimination since it enables a central analysis and detection of potential issues, thereby allowing the Group to respond to and remedy them appropriately.

Since ZF is a foundation-owned corporation, neither employees nor managers receive shares of ZF Friedrichshafen AG.

HR DEVELOPMENT

Education and training of our employees are an essential part of HR development at ZF. After all, our people are the central element of long-term success: The better a company's employees are qualified, the greater the company's power of innovation. This is particularly true for the automotive industry in its current transformation phase. ZF therefore uses a holistic HR development approach: It places its employees at the core of its activities to attract the best talent, to promote education and further training, and thus to be the employer of choice for internal and external talents.

Talent promotion

Attracting and retaining high-performance talent through training and growth opportunities is the key to our company's success. Talent development is therefore supported by various programs on all levels. The Performance Potential Succession process is the starting point for all development activities. The dialogue between employees and the corresponding next highest-level manager starts with discussing performance and potential. This is followed by development conferences to review the results within the respective leadership teams and to discuss and agree on specific individual development measures. In 2022, about 30,000 employees participated in the process. The rollout to all indirect employees worldwide is currently ongoing.

With a strong focus on people and career development, we have set up various talent pools, which are holistic programs for strategically relevant talent groups. The program "mobilize ZF" enables global top talents to take over a larger scope of responsibility. We have also introduced the "Plant Manager Development Program", which focuses on employees prepared to become plant managers. "Empower, HerPower", a female talent pool aimed at increasing female representation in leadership functions, was launched in 2022 together with "Digital GameChangers", which supports the development of our digital talents.

All talent pools offer participants the opportunity to undergo intensive development for the program duration of up to one year, to enhance knowledge, establish new contacts within the Group, focus on trend topics and increase their own visibility. Talent pools, however, are just one aspect of talent development at ZF. The external talent development program tranZForm is ZF's international graduate and trainee scheme. In 2022, a concept was introduced which focuses on greater internationalization and prepares participants through position-focused projects and specific training courses.

Training

A vast range of training opportunities is available to employees of all functions and levels to support personal and career growth. In Germany, the "Ausbildung 2030" (Vocational Training 2030) project aims at creating a training network, making greater use of new ways of learning and developing future technologies. The goal is a sustainable reorientation of vocational training towards new challenges during the transformation of the German locations. It focuses on the digitalization of training methods and content.

During 2022, the E-Cademy could be considered ZF's lighthouse for training. To date, the offer is targeting up to 30,000 employees in the Electrified Powertrain Technology Division and includes: e-learning basics, reskilling programs and a learning roadshow for the shopfloor with detailed learning content around e-mobility. With over 13,500 active online users and 8,000 classrom participants, it is the largest qualification initiative in the company's history to date –

enabling employees to build up future-proof skills and to actively shape the transformation of the automotive industry. Various reskilling journeys provide the opportunity to move into future-relevant job roles. This was also acknowledged externally: In 2022, ZF won the German Human Resources Management Award in the category "Talent & Learning".

The E-Cademy also serves as a blueprint for another learning initiative. Digitalization has the potential to make processes and products more efficient and effective, thus providing great opportunities for pushing sustainability across ZF. It is therefore of enormous importance and requires a certain level of digital skills among all ZF employees. Digital Fundamentals is an online training that teaches highly focused basic knowledge, enabling ZF employees to shape the digital transformation of the entire automotive industry competently and confidently. Starting October 2022, the initiative reached 10,000 active learners within three months. It combines self-paced learning courses released every month with podcasts, regular live expert sessions, articles and blogs recognized for their added value in the topic. While ZF initiates upskilling for digital transformation, the company is anchoring a learning culture that focuses on the long-term training needs around digitalization.

Leadership training

To adapt to future challenges, the Group also revised its training landscape for managers. The basic structure of all planned activities was developed together with the Leadership Pioneer Group, a team of globally active managers. Acting as an innovation lab, this team discusses, challenges and tests new leadership approaches and tools. It functions as a sparring partner to discuss with the Board of Management how to develop leadership behavior in a future-oriented and sustainable way to increase impact. In addition, the Leadership Pioneer Group held a leadership lab with a group of young talents to elaborate core aspects of future leadership.

The "Next Generation Leadership initiative" focuses on supporting newly appointed managers in their role. It includes several programs, training offers and tools. Since 2022, a holistic leadership landscape with specific offers for each management level is in place. All content follows a central theme and all programs are aimed at supporting ZF managers in gaining a common understanding of leadership, thus transferring the corporate strategy to their field of responsibility. Besides these program and training offers we have introduced a virtual "Leaders@ZF Platform" to provide transparency on all important elements of leadership development.

Employee surveys

ZF is currently working on the implementation of a survey and feedback platform. The key objective is to actively listen to our employees and to understand what drives engagement at ZF in order to identify necessary actions for improvement. Two types of employee surveys started at the end of 2022:

- The global employee engagement survey determines what general company image employees have, including aspects of employee satisfaction, identification and affiliation with the company as well as employer attractiveness. In 2022, ZF conducted a global survey covering 22 locations with about 18,000 employees. In future, there will be engagement surveys among all employees on a regular basis to gain a global overview of the engagement status within the company.
- Lifecycle surveys provide information and measurement of employee experiences during critical phases such as onboarding and company exits. Designed in 2022, lifecycle surveys will be implemented during 2023.

OCCUPATIONAL SAFETY AND HEALTH

The safety, health and well-being of all employees are core values and top priorities of ZF's corporate culture. That is why these aspects are an essential part of the sustainability strategy under the action field "Keeping People Safe". Nobody shall be harmed, within or outside the company. Therefore, we strive to constantly reduce risks of industrial accidents and occupational diseases.

Responsibilities and organization

Safety and health at ZF are anchored within the existing Sustainability and EHS organization. Essential activities and developments are reported regularly to top management. Tasks and the authority to issue instructions have been delegated to the corporate Head of EHS Operations, who leads the Environmental Protection, Occupational Safety, Health Services functions as well as the regional EHS teams. Divisional EHS experts coordinate relevant aspects for the respective divisions and/or business units. Local experts implement the requirements of the EHS management. The EHS policy, directives and frameworks are defined and continuously improved cross-functionally within the Corporate Governance and Standards Function. This function also reports directly to the Head of Sustainability and EHS and works closely with the global EHS organization on all levels.

All ZF locations manage their EHS activities in alignment with the global EHS management system. The EHS management system focuses on preventing and minimizing environmental, health and safety risks. Serving as the backbone of the continuous EHS improvement, this system aims to implement the EHS policy's contents regarding EHS legislative compliance, risk minimization and safety improvement. It also considers all relevant international standards in the related context. The improvement program promotes cooperation between different business units and is regularly updated to consider stakeholder feedback, legislative changes and customer requirements. Progress is evaluated through self-assessments and as part of the EHS Corporate Audit Program. This program, performed by a third party, also includes an evaluation of legal compliance.

Managers, supported and trained by EHS specialists, carry out regular risk assessments using methods such as FMEA (failure mode and effects analysis) and applying the hierarchy of controls (substitution, technical, organizational and personal protective measures). Systematic risks are reduced through binding measures and requirements defined in an annual update of the EHS management system, focusing on constantly improving workplace safety. The risk assessment of work-related hazards is carried out in close cooperation between employee and executive managers within all workplaces and activities, regardless of the kind of employment.

ZF strives for the highest EHS performance along the entire supply chain. This applies above all to suppliers providing services at the locations. A newly founded expert team constantly monitors and improves contractor management. Contractors are selected based on their proven ability to perform safety-critical activities. Close cooperation between trained ZF supervisors and contractors, such as discussing contractors' risk assessments and control measures, proved to be an important factor in improving the safety of contract employees.

Locations can be certified in accordance with the international ISO 45001 standard voluntarily or at the customer's request. This is primarily performed through a matrix certification procedure to guarantee uniform application of ZF standards. 109 locations (2021: 88) used a matrix certification and 20 locations an individual certification in 2022. Certified locations evaluate the effectiveness of the ISO management system through internal audits and report major deviations to the Global Domain Function in a regular cycle of six months. The results are integrated into the continuous improvement process. Corrections are implemented in the internal EHS management system.

The ZF EHS management system includes a standardized element concerning occupational health. The procedure is aligned with the ISO 45001 standard and covers both core medical issues and health-related interdisciplinary matters (e.g., health promotion programs, counselling on social issues). Based on the results of the self-assessments, ZF introduced a continuous improvement program in this context as well.

The EHS management system stipulates that the location management is to actively approach employees and their representatives and encourage them to participate in EHS initiatives and decision-making processes. Management is to define the scope of this participation to meet any applicable legal requirements and involve employees comprehensively. Employee participation in EHS programs through activities and initiatives is encouraged and supported by bodies and teams such as EHS committees and ergonomics teams.

Targets

Our vision is to ensure safety along the entire value chain. At the same time, we consider effective prevention to be more than merely complying with legal requirements – but rather increasing employer attractiveness and employee retention. The Group has therefore defined specific targets to preserve, protect and promote its employees' health, well-being and satisfaction. These were released by the Board of Management in 2021 and are still valid:

- By 2025, reduce the Group's lost time accident rate (LTAR, accidents with working days lost per one million working hours) to 2.0 in order to achieve an industry-leading performance.
- By 2025, reduce the severity rate of accidents to 8 working days lost (per accident) by increasing the focus on injuries and near misses with a high severity rate or high severity potential.
- By 2025, achieve a low ergonomic risk profile for 90% of the workplaces. Hazard assessments and improvement measures are to be implemented according to global standards, such as those of the National Institute for Occupational Safety and Health (NIOSH) or the Key Indicator Method.
- By 2025, each location must appoint local occupational health professionals to ensure that occupational health expertise is always available.

Occupational health and safety committees

About 75% of ZF employees are covered by national, regional or local collective agreements. Within the company, they are represented either by trade unions, works councils or both. Temporary workers or service providers are subject to their employer's collective agreements, in which they are represented by employee representatives such as works councils, if applicable.

The German Occupational Health and Safety Act stipulates that occupational health and safety committees are to be organized at all German locations. Members of works councils are also to be represented in these committees. Prior to the committee meetings, occupational safety and health specialists, company doctors, works council representatives and responsible managers carry out inspections and audits. The objective is to gain insight into the status and requirements for change. In accordance with Section 11 of the Occupational Safety Act (ASIG), the Occupational Safety Committee (ASA) has the task of advising on occupational safety and health concerns and accident prevention in the company. It brings together the departments responsible for occupational health and safety in the company. The ASA meets at least once every quarter, is a non-decision-making body and only has the right to make proposals and recommendations. The decision-making authority lies with the employer and the works council.

The principle of co-determination also applies to occupational safety and health at ZF's German locations. The works councils of the locations and the Group Works Council cooperate closely regarding these issues. Employee representatives in Germany, for example, have a right to co-determination when it comes to certain occupational safety and health regulations. In other countries, various local rules on occupational safety and health are being considered.

Employee engagement

After several years of strong accident rate improvement, this trend slowed down during 2021. For further improvements, the global EHS team launched the "ENGAGEtobeSAFE" initiative in 2022. It consists of three main elements: a global information and awareness campaign on safety, diverse leadership and employee engagement activities, and a top management follow-up on safety measures and KPIs. All divisional leaders committed to actively support the reactivation of the Safety Excellence Program as well as to monitor improvements and roadblocks with plant managers at focal sites on a monthly basis. This is accompanied by Safety Leadership workshops and site visits by members of the global EHS team.

To reach out to all employees globally, we frequently recorded on-the-job-videos with safety tips from colleagues and published these in ZF's intranet. Plants from all over the world contributed suggestions for improvement on various topics. Employees shared how they help each other to avoid accidents and act as safety coaches. For use on all sites, the EHS team additionally developed a toolbox of measures and communication tools to address a wide variety of hazards and how to avoid them. Besides the "ENGAGEtobeSAFE" campaign, the Safety Excellence Program continued with its three key areas: leadership in occupational safety and health (Safety Leadership), employee involvement (Behavior-Based Safety) and the continuous improvement of the EHS management system. Classic occupational safety topics are covered in the established programs on ergonomics and machine safety.

All employees and their representatives are involved in the continuous improvement of occupational safety and health and are subject to regular qualification measures. In the case of near misses and unsafe situations, employees are requested to report those and to participate in activities such as risk assessments, kaizen workshops and suggestion schemes. ZF has established a policy against reprisals and employees receive feedback as to how their reported information is handled. The general ZF Trustline is also available to report complaints regarding occupational safety and health issues. These reports are treated with strict confidentiality. Furthermore, an EHS best practice database was established in 2022. This platform invites all employees to share solutions and ideas.

As required by the EHS management system, many locations have developed employee reward schemes to recognize their employees' contributions to improving safety. Employee participation is also subject to internal audits. Employee statements made in this context are treated confidentially. Should unacceptable risks arise, employees have the right to stop working in order to speak to their supervisor or safety officer. All managers are made aware of this possibility and are trained in how to respond appropriately.

Key figures on work-related accidents

To monitor safety performance, work-related accidents resulting in lost time are recorded and analyzed. At the beginning of 2022, a new data reporting system was installed to provide more detailed information regarding incidents. This includes separate disclosure of incidents involving temporary workers and categorization according to severe incidents or fatalities (SIF) potential.

Reducing the Group's LTAR (accidents with working days lost per one million working hours) to 2.0 by 2025 is one of the major targets within occupational safety and health. For work-related accidents resulting in lost working days, ZF's LTAR, based on 331 million hours worked, amounted to 2.8. The Group was able to achieve a 7% improvement compared to the previous year. As in previous years, the regions outside of Europe have made significant progress and already achieved their goal for 2025. In Europe and Germany, the LTAR rate was similar as in the previous year. To identify fields with improvement potential and to implement action plans, monthly reviews were implemented between the heads of the divisions and their respective locations. Furthermore, Group experts and various divisional management teams held additional safety leadership workshops to increase management attention.

Data shows that 73% of ZF's nearly 490 reporting units are achieving a good LTAR performance (under 2.5). In Europe, further improvement is needed. The Group's focus is now on the 10% of the reporting units with an LTAR above 10. The number and rate of high-consequence work-related injuries and of recordable injuries, such as cases of reduced working capacity or injuries beyond first aid, will also be recorded in the new database, which was implemented in 2022.

Rate of accidents (LTAR) by region [1]

in %	2022	2021 [2]	2020
EMEA	5.2	5.2	5.7
thereof Germany	7.1	7.1	7.9
thereof Europe (excluding Germany)	3.1	3.0	3.3
North America (including Mexico)	1.0	1.3	1.3
South America	1.8	2.8	2.8
Asia-Pacific	0.3	0.4	0.5
Africa	3.7	included in Europe	included in Europe
ZF Group	**2.8**	**3.0**	**3.3**

1) Figures include temporary workers, interns and student trainees
2) Figures have been adjusted compared to the previous year's report with consideration of the former WABCO locations

Unfortunately, one ZF employee suffered fatal injuries after a forklift collision in 2022. A special global initiative was launched to reassess potential risks related to forklift traffic and further improve pedestrian safety.

Reducing the severity rate of accidents is a further main target of EHS Operations. The severity rate in 2022 was 23.3 (2021: 22.5), which is a 4% increase. To reduce this rate, more detailed investigations (e.g., root-cause analysis) of accidents or near misses with high severity potential are being conducted. The analysis is also supported by the new database. Furthermore, the "ENGAGEtobeSAFE" campaign sensitizes all employees globally to contribute to this goal.

Occupational illnesses

According to the current annual survey of the occupational disease situation, 97 recognized occupational diseases were reported in 2022. As occupational diseases can have a serious impact on the employee as well as on the company, it is our aim to raise the awareness of all concerned parties and initiate appropriate preventive measures. It is necessary to reduce health hazards and even more important to keep track of the derived actions and continuously focus on enhancing them.

Our evaluation identified the group of musculoskeletal disorders (ILO code 2.3.) as a top priority, as these account for about 65% of recognized occupational diseases. Accordingly, ongoing programs and activities, such as behavior-based safety programs and local health events that aim to improve ergonomics in the workplace and promote health, continue to be of great importance. Therefore, locations continue to be added to the Group's software-based ergonomics program. Initial induction workshops were held – some of them virtually, due to Covid restrictions. The program includes e-learning, ergonomic hazard assessment and best practice solutions and is supported by a video analysis tool. The workplace hazard assessments are performed by members of a trained ergonomics team at each location. Most locations reported being on track to achieve the Group's target to eliminate workplaces with a high level of ergonomic risk and reduce the share of workplaces with a medium level of risk to less than 10% by 2025.

The information collected in 2022 is being analyzed and evaluated. If necessary, additional preventive measures will be initiated in coordination with responsible occupational health professionals worldwide and relevant players within the organization.

Local health management measures

Another main target is the appointment of local occupational health professionals to ensure that occupational health expertise is available at all ZF sites at all times. By the end of 2022, at least 95% of the reporting sites had already achieved this target. The qualification requirements for occupational health professionals have been defined at Group level in order to guarantee the necessary quality standards. All ZF locations are obliged to implement at least one health promotion campaign per year. Effective health protection and accident prevention policies can protect employees from a variety of hazards and health risks in the workplace.

A large variety of activities concerning health in general were offered in addition to the work-related health programs e.g., active breaks, information provided via the intranet, lectures and company sports groups. They were conducted both internally and in cooperation with external providers (e.g., gyms). All employees were able to participate locally.

The impacts of the Covid-19 pandemic had ongoing effects in terms of health protection. The interdisciplinary cooperation of all specialist functions and the consistency and discipline of the employees made it possible to provide the necessary health protection in the company. In 2022, additional campaigns were introduced to cope with the pandemic. Because of the diversity of local pandemic situations, specially adapted measures were required. While in Germany, for example, intensive efforts were made in the first half of the year, the developments in China demanded greater attention towards the end of the year.

Vaccinations against Covid-19 made a substantial contribution to dealing with the pandemic. ZF prepared, organized and implemented vaccination campaigns at the locations. Since the start of our on-site vaccination initiative, over 47,200 vaccinations (in 2022 over 5,200 vaccinations) have been administered to employees and, in some cases, also their relatives at all locations where this was permitted by law. If necessary, company-owned vaccination centers can be reactivated.

DIVERSITY AND EQUAL OPPORTUNITIES

The ZF Group is committed to diversity, equity and inclusion. That is why we constantly strive for an inclusive culture where all employees develop a sense of belonging. As a benefit, the diverse workforce is a driver of innovation and one of ZF's most important factors for being successful as a business and in its business transformation. We foster the exchange of thoughts, ideas and methods between different cultures and people in the company. This applies, for example, to the recruitment of new employees, existing employment relationships and professional advancement in the company. The key characteristics are performance, personality, qualification and the application of our ZF Way guiding principles.

Responsibilities and organization

Diversity, Equity & Inclusion (DEI) is not only part of ZF's HR strategy but also one of the five ZF Way principles that guide the company's actions. The Group's DEI activities are based on the four building blocks of the DEI strategy: culture, talent, leadership and sustainability. The global diversity team, representing each ZF region, is tasked with further developing the strategy and implementing global and regional activities and initiatives. It is supported by diversity managers, experts and various employee initiatives worldwide. ZF focuses on particular action fields to meet strategic challenges and contribute to enhancing the Group's future competitiveness. These action fields include a balanced gender ratio, aspects such as the workforce's cultural background and internationality, a wide range of experience and expertise as well as responses to demographic change. All these action fields are systematically analyzed and processed on a regular basis, and the results are reported to the Board of Management. One of our targets is to increase the share of female managers at all management levels in the Group to 20% by 2028. To support target achievement, the Supervisory Board and the Board of Management decided to link the increase in gender diversity as an indicator for the long-term incentive of ZF's senior management from 2023 onwards.

Furthermore, ZF aims at building more international leadership teams, which better reflect the diversity of ZF's regional business activities and our customer base worldwide. Numerous events highlighted different diversity perspectives in 2022 to promote and strengthen diversity in the company.

ZF fosters collaboration among employees from different departments, areas of expertise, countries and backgrounds to promote new ideas and innovative solutions. Through Employee Resource Groups (ERGs) in ZF's intranet, expertise in various areas of interest can be built, thereby strengthening networked cooperation. These groups include (Wo)men@ZF, Pride@ZF, Diversity@ZF and the ZF North America Diversity Advocacy Council. New ERGs such as a Women's Resource Group in China and a ZF Europe Diversity Advocacy Council are planned.

Besides various activities to support diversity and inclusion, we further expanded the internally and externally available ZF Trustline, with which possible violations of ZF values and guidelines regarding diversity, equity and inclusion can be reported. For more

information on the topic, please refer to the ↘ **Business conduct** chapter.

Diversity, equity and inclusion activities in 2022

In May 2022, ZF held its fourth Diversity Day at various locations around the world. ZF also conducted several communication, education and awareness events in 2022 to draw attention to promoting DEI, using the international motto #BreakTheBias. The activities involved leaders and role models from ZF. One key element among all activities was the introduction of the on-demand learning regarding Unconscious Bias. It was designed to implement awareness of diversity, equity & inclusion throughout the organization. 14,000 employees completed two self-paced trainings by the end of 2022.

Regarding recruiting, ZF intensifies its efforts to ensure unbiased recruiting and to constantly enlarge its talent bases by actively reaching out to and shortlisting diverse candidates.

Living diversity at ZF also means that managers and employees should act as ambassadors and lead by example. A diversity community at top management level was set up by ZF in order to ensure the involvement and commitment of leaders and to gain their feedback on new pilot programs. The community participated in several regional and global panel discussions covering topics such as inclusion, mental health and the ZF Way. This approach enabled top executives to learn, contribute and share proven DEI practices.

In 2022, ZF strengthened its external DEI commitment through new memberships and increased involvement with external partners such as the PrOut@Work Foundation, the Center for Automotive Diversity & Inclusion Advancement (CADIA) and Charta der Vielfalt (Germany). New partnerships also include Out & Equal, Disability:IN and Women in Manufacturing. These globally recognized organizations reinforce ZF's commitment to supporting minorities and assist ZF by providing the necessary resources, best practices and networking opportunities for our internal diversity networks.

Promoting equal opportunities

In addition to fair remuneration systems, tailored training and various mentoring initiatives, the ability to harmonize work and family life is an important element in enabling equal opportunities. The ZF locations Friedrichshafen, Passau, Schweinfurt, Saarbrücken and Lemförde have been certified in Germany as family-friendly companies. As part of the "work&family" ("berufundfamilie") audit, family-related targets and measures have been firmly established. This audit is widely recognized and is an excellent instrument for increasing employer attractiveness and employee commitment. Current measures comprise, for example, very flexible options for working hours and practical solutions also in shift operation, or Group agreements such as "ZF Parental Leave" and "ZF Sabbatical". A culture of cooperation and partnership is of great importance to ZF and all parties equally benefit from this certification.

The possibility that both parents can devote time to their family is an important component in promoting equal opportunities. At the end of December 2022, a total of 509 employees were on parental leave in Germany (2021: 509), with 133 of them being male (2021: 20) and 376 being female (2021: 489). A total of 204 women (2021: 244) and 1,648 men (2021: 1,891) took parental leave of up to one year in 2022. In the year under review, 1,888 employees (2021: 2,148) returned from parental leave in Germany – those being 300 female (2021: 330) and 1,588 male (2021: 1,818).

DIVERSITY FIGURES

ZF reports and reviews diversity figures on a regular basis to identify a potential need for action. Major diversity figures focus on age, gender and physical abilities. When it comes to age diversity, demographic change takes many different forms in different regions of the world. While western industrialized countries are primarily confronted with the challenges of an aging population, developing and newly industrialized countries have far younger populations. ZF is represented at 383 locations in 40 countries. The age structure of the workforce is thus very heterogeneous and strongly influenced by the respective locations. The percentage of older employees is much higher in Europe, where the average age is 42.6 years, whereas the workforce in other regions tends to be younger on average. In India, for example, the average age is 28.7 years.

Among the various regions, there is also a large spread regarding the proportion of women and men employed at ZF. While 41.8% of employees in North America are female, women make up only 23.6% of the European workforce. Germany shows an even lower percentage, at 14.5%. In 2022, 73.1% (2021: 73.4%) of the total workforce were men and 26.9% (2021: 26.6%) were women. For more information on men and women in senior management positions, please refer to the ↘ **Basic Principles of the ZF Group** chapter.

Since 2006, ZF Friedrichshafen AG has been compliant with the statutory requirements for employees with disabilities and has met the required rate for Germany. Accordingly, ZF also implements the necessary measures to integrate employees with disabilities. These employees are supported by a global EHS (environment, health and safety) team. In 2022, the proportion of employees with disabilities amounted to 5.8% (2021: 5.9%). This level exceeded the minimum 5% stipulated by legislation.

Employees by region and gender

	Women			Men		
in %	**2022**	2021 [1) 2)]	2020 [2)]	**2022**	2021 [1) 2)]	2020 [2)]
Europe	23.6	23.2	23.5	76.4	76.8	76.5
thereof Germany	14.5	14.4	14.2	85.5	85.6	85.8
North America	41.8	41.0	39.5	58.2	59.0	60.5
South America	14.7	15.0	13.8	85.3	85.0	86.2
Asia-Pacific	21.5	21.6	25.0	78.5	78.4	75.0
Africa	38.0	30.5	28.0	62.0	69.5	72.0
ZF Group	**26.9**	**26.6**	**26.6**	**73.1**	**73.4**	**73.4**

1) As of 2021 incl. the former WABCO locations
2) Figures for 2020 and 2021 were calculated including employees of diverse/unspecified status.

Diversity by age

	Women			Men		
in %	**2022**	2021 [1)]	2020 [1)]	**2022**	2021 [1)]	2020 [1)]
Management						
Under 30 years	0.7	-	-	0.3	-	-
30–50 years	68.1	-	-	52.1	-	-
Over 50 years	31.2	-	-	47.6	-	-
Employees						
Under 30 years	22.3	-	-	20.7	-	-
30–50 years	56.7	-	-	56.2	-	-
Over 50 years	21.0	-	-	23.1	-	-

1) Data of previous years cannot be calculated

Supply Chain

KEY FACTS

- > New sustainability scoring model to assess suppliers' sustainability performance
- > Detailed risk analysis initiated to identify raw materials critical to responsible sourcing
- > Full member of the Responsible Supply Chain Initiative e.V. (RSCI)

A steady supply of materials and components lays the foundation for high-quality products and thus for customer satisfaction. ZF's upstream supply chain provides about 60% of its value creation. Our suppliers and with them the workers along the whole value chain are among the most valuable goods and need to be always protected. A trusting and reliable collaboration with suppliers is of utmost importance to ZF. Only professional supply chain management can ensure high quality and timely delivery of ZF's products.

For production materials, ZF maintains a worldwide network of approximately 12,000 suppliers, ranging from small family businesses to large corporations. These include approximately 1,000 strategic suppliers. Furthermore, ZF cooperates globally with about 54,600 suppliers of non-production materials. The purchasing volume for production materials increased to €24.6 billion in 2022 (2021: €21.6 billion), including directed buy volumes, for which ZF's customers define which sub-suppliers are to be subcontracted. The purchasing value of non-production materials amounted to €7.7 billion in 2022 (2021: €5.7billion). The increase in comparison to the previous year is affected by the high level of raw material prices and further price increases.

PROCUREMENT PRACTICES

Costs are not the only important aspect in the context of value chain management – sustainability and resilience in the supply chain are also becoming increasingly important. ZF's Purchasing and Supply Chain Management is therefore responding to disruptive changes (i.e., caused by climate change and technology shifts) with a clear strategy towards an integrated, resilient and sustainable value chain. This includes products and processes such as digital purchasing processes (e.g., for supplier's PCFs) and Supply Chain Management 4.0. To this end, quality, logistics, speed, risk prevention and demand management need to be taken into account as these form the strategic focus topics for sourcing. These aspects are aligned with ZF's overall Next Generation Mobility strategy and its Digitalization Roadmap. To strengthen all sustainability-relevant activities within the supplier base, ZF Materials Management set up a team for sustainability in the supply chain.

Business Partner Principles

All new and existing suppliers are required to endorse ZF's Business Partner Principles (BPP), which represent the values that are indispensable to ZF. Compliance with national and international laws and regulations at all locations worldwide is the minimum requirement. The BPP also conform to various principles and conventions, such as the principles of the UN Global Compact, the OECD Guidelines for Multinational Enterprises, the Universal Declaration of Human Rights, the UN Guiding Principles on Business and Human Rights and relevant conventions of the International Labor Organization.

These guiding documents address topics such as human rights, labor standards, occupational safety and health, environmental protection, business ethics and compliance. In particular, business partners are expected to reject all forms of slavery, forced labor and child labor. ZF also expects them to respect freedom of association and the right to form interest groups, to provide fair and appropriate remuneration and working times in accordance with applicable law, and to promote the qualification of their employees. The BPP also expect suppliers to ensure that these values are respected in their supply chains.

In Germany, external service providers must sign an additional declaration of compliance to collective agreements guaranteeing fair wages, normal working hours and the rejection of unregistered labor and tax evasion. This declaration also applies to subcontractors engaged by ZF and includes the provision that ZF may assess compliance at any time.

The acceptance of the BPP is mandatory for new awards to existing suppliers and for the registration of new suppliers. ZF reserves the right to scrutinize business relations and take appropriate action if deviations

or violations are identified. In 2022, we started the revision of the Business Partner Principles to further specify existing requirements, especially for social and environmental topics. With these adjustments, ZF will make sure that all relevant topics included in the German Act on Corporate Due Diligence in Supply Chains are addressed. Publication and roll-out is scheduled for 2023.

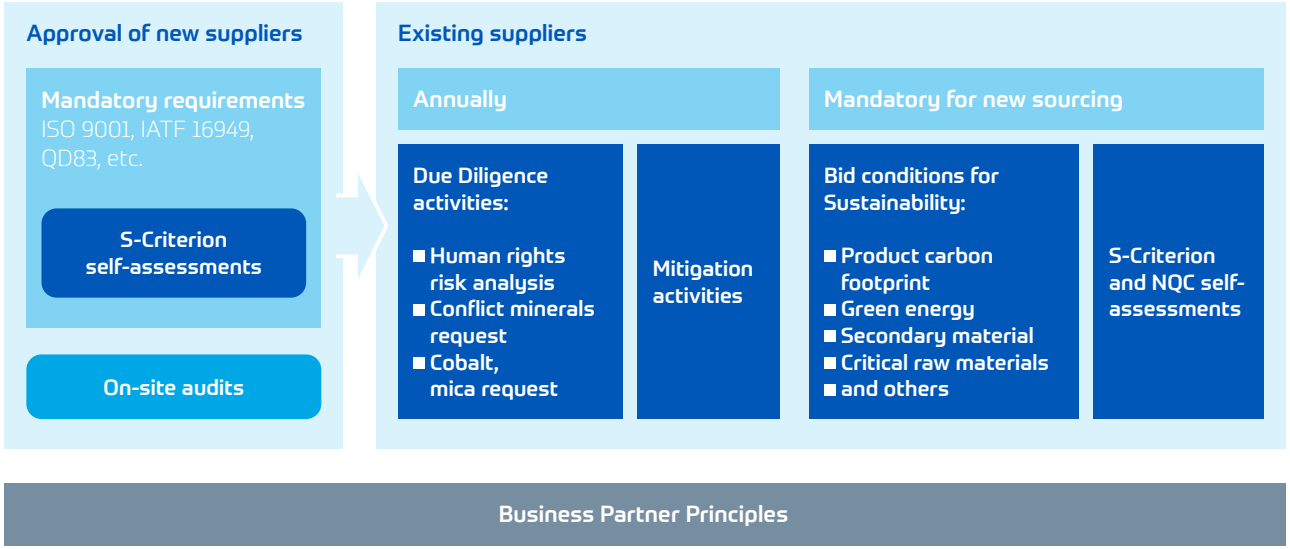
Furthermore, product-related environmental protection aspects are addressed in the Supplier Quality Directive (QD83) and the Global Logistics Directive. These documents also apply to subcontractors and cover guidelines such as the EU Chemicals Regulation (Registration, Evaluation, Authorization and Restriction of Chemicals or REACH) as well as logistics and packaging specifications.

Supplier assessment

To ensure responsible procurement practices, the Group has appointed a cross-functional Sourcing Decision Board (SDB). This is the highest decision-making sourcing body at ZF and ensures that the selected suppliers likewise fulfill sustainability, quality, technical, logistics and pricing requirements. Target conflicts are also resolved within the SDB.

We take sustainability aspects into account at an early stage, even before establishing a new business relationship. All potential suppliers need to meet ZF's requirements for quality, logistics, finance and sustainability before entering a business relationship. Only suppliers included on ZF's Approved Supplier List can be awarded new business. To assess compliance with the sustainability requirements set by our Business Partner Principles, we use the Sustainability Criterion. It is applied as a self-assessment questionnaire that covers topics such as climate, human rights and compliance, environment, as well as health and safety (EHS). In addition, we conduct quality on-site audits that partly include human rights topics (e.g., occupational safety).

Supplier approval and sourcing of production material



A completed questionnaire is mandatory not only for the approval of new suppliers, but also for new sourcing from existing suppliers. Suppliers are not contracted if a supplier fails to provide a completed questionnaire, the achieved score is below 25% or the signed acceptance sheet of the ZF Business Partner Principles is not submitted.

As part of continuous development, ZF decided to gradually replace its Self-Assessment Questionnaire during the first half of 2023 by the industry-specific Self-Assessment Questionnaire (SAQ) via the global NQC platform. The use of standardized tools makes processes more efficient for ZF and its suppliers. At the same time, subcontractors gain an overall impression of the Group's sustainability expectations. Thus, key topics can be prioritized more effectively.

Risk management in the supply chain

ZF uses a risk management process to systematically analyze and evaluate its supply chain regarding compliance with social and environmental standards and to identify risks early on. Based on our initial risk assessment and prioritization of direct suppliers (Tier 1) for production materials and non-production materials in 2021, the rollout of the Self-Assessment Questionnaire via the global NQC platform targeted 1,800 production material suppliers and was completed by the end of 2022. ZF achieved a coverage rate of 82%. The supplier engagement is ongoing and our aim is to receive the questionnaire from all further suppliers. The result

helps us to create transparency and identify suppliers with a potential risk of violating sustainability standards.

Using its own systems, ZF supplements the result with additional information on a supplier's sustainability performance, leading to an internal risk assessment for the supplier location. 387 suppliers did not meet the ZF minimum sustainability requirements in 2022. Therefore, we requested corrective preventive measures to minimize these risks. We are planning to request on-site social audits for suppliers with a higher risk of human rights violations from 2023 onwards.

As an important component in the fulfillment of corporate due diligence and legal requirements, sustainability audits are instruments which, like quality or occupational safety audits, make it possible to check working conditions on site, at least on a case-by-case basis. For this purpose, ZF has joined an initiative for sustainable supply chains in the automotive industry called Responsible Supply Chain Initiative e.V. (RSCI). This initiative focuses on reviewing and further developing the sustainability of companies in the supply chains of members by means of on-site assessments and corresponding tracking. The aim is to create fundamental transparency regarding working conditions, which is why corresponding audits also take place directly at the production site. The results can be shared, thus avoiding multiple audits.

In addition, notifications and reports on other critical issues in the supply chain, such as child labor, violations of human rights or environmental protection, can be communicated via the ZF Trustline. For more information, please refer to the ↘ **Business conduct** chapter.

Our suppliers are made aware of this notification system in the Business Partner Principles, among other means. In 2022, one case was reported to ZF regarding alleged human rights violations by a ZF supplier towards its employees. The allegations were followed up by a joint team from Human Rights, Compliance, Purchasing and the legal department through document enquiries and reviews with the supplier but could not be substantiated. Nevertheless, preventive measures were agreed with the ZF supplier and are being followed up to ensure timely completion.

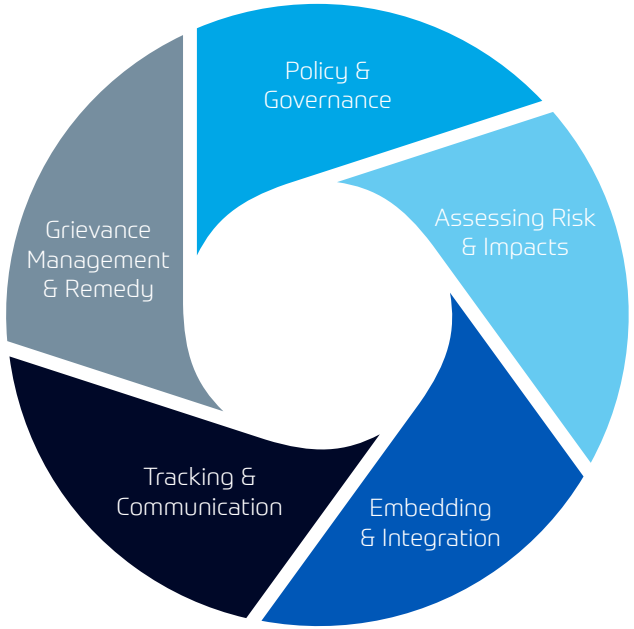
Preparing for the German Act on Corporate Due Diligence Obligations in Supply Chains (Lieferkettensorgfaltspflichtengesetz or LkSG for short in German) and for requirements resulting from future EU legislation is an important assignment, especially when it comes to human rights risk management. To ensure compliance with the German law on due diligence of companies in supply chains, we have conducted an analysis of our existing approach to human rights risk analysis. ZF will complete the necessary adjustments in the first half of 2023. The main task is to enable ZF to fulfill all core elements of the human rights due diligence (HRDD) approach.

Promoting sustainability in the supply chain

ZF manages sustainability-relevant supplier documents and information in a digital supplier portal. An onboarding team ensures that all suppliers are included in the portal. Suppliers are expected to maintain a supplier profile with up-to-date information. If this is not the case, the managed service asks the supplier to update information and expired certificates.

ZF then consolidates all internal data at plant level via a supplier scorecard consisting of the dimensions General, Performance, Purchasing and Risk. To enable access to our suppliers' sustainability performance in a holistic manner, a project team was formed to implement a new sustainability scoring model. The implementation is planned for Q1 2023.

Elements of the Human Rights Due Diligence (HRDD) approach



Regarding learning, ZF has extended the Supplier Academy platform to support cooperation with production materials suppliers and, at the same time, promote supplier qualification regarding sustainability. ZF suppliers are given the opportunity to take part in seminars held in their regions. Participation provides suppliers with in-depth training on ZF requirements and standards in the areas of environmental issues, human rights and EHS, and on corresponding guidelines and procedures. Basic training modules were implemented in 2022. We are constantly working to improve our training offer.

RESPONSIBLE SOURCING OF CRITICAL RAW MATERIALS

The extraction of raw materials comes with high risks from an environmental and social perspective. As ZF is aware of these risks, we strive to ensure compliance with environmental and human rights standards along the entire value chain. In 2022, we started to conduct a detailed risk analysis. Identifying the raw materials of relevance for the ZF Group that are associated with significant risks will help create a concept to mitigate those risks.

In a first step, we have expanded our established due diligence activities for Conflict Minerals (3TG) to the supply chains for rare earth elements and cobalt. Further mitigation measures are the reduction, or if possible, elimination, of rare earth elements in our products and the increase of the recycled material share. For cobalt we have initiated a process similar to that for conflict minerals. We are working closely together with our direct suppliers to increase transparency and encourage the use of mines certified to the standard of the Initiative for Responsible Mining Assurance (IRMA). By using the standardized Extended Minerals Reporting Template (EMRT) of the Responsible Minerals Initiative, we ensure traceability by collecting due diligence information in the cobalt and mica supply chains. For more information regarding SUSMAGPRO, please refer to the ↘ **Product development** chapter.

ZF is also active in the "Automotive industry dialogue: Respect for human rights along supply and value chains" set up by the German Federal Ministry of Labor and Social Affairs. The results of this project will support us in improving our preventive measures for raw material supply chains. It focuses on adequate application of sustainability standards as part of human rights due diligence (HRDD) processes and identifies complementary measures. A decision-making aid on adequate use and a collection of complementary measures are to be developed as part of the pilot project. It adopts an action-oriented research approach, engaging with two pre-selected sustainability standards that are applicable to the copper value chain.

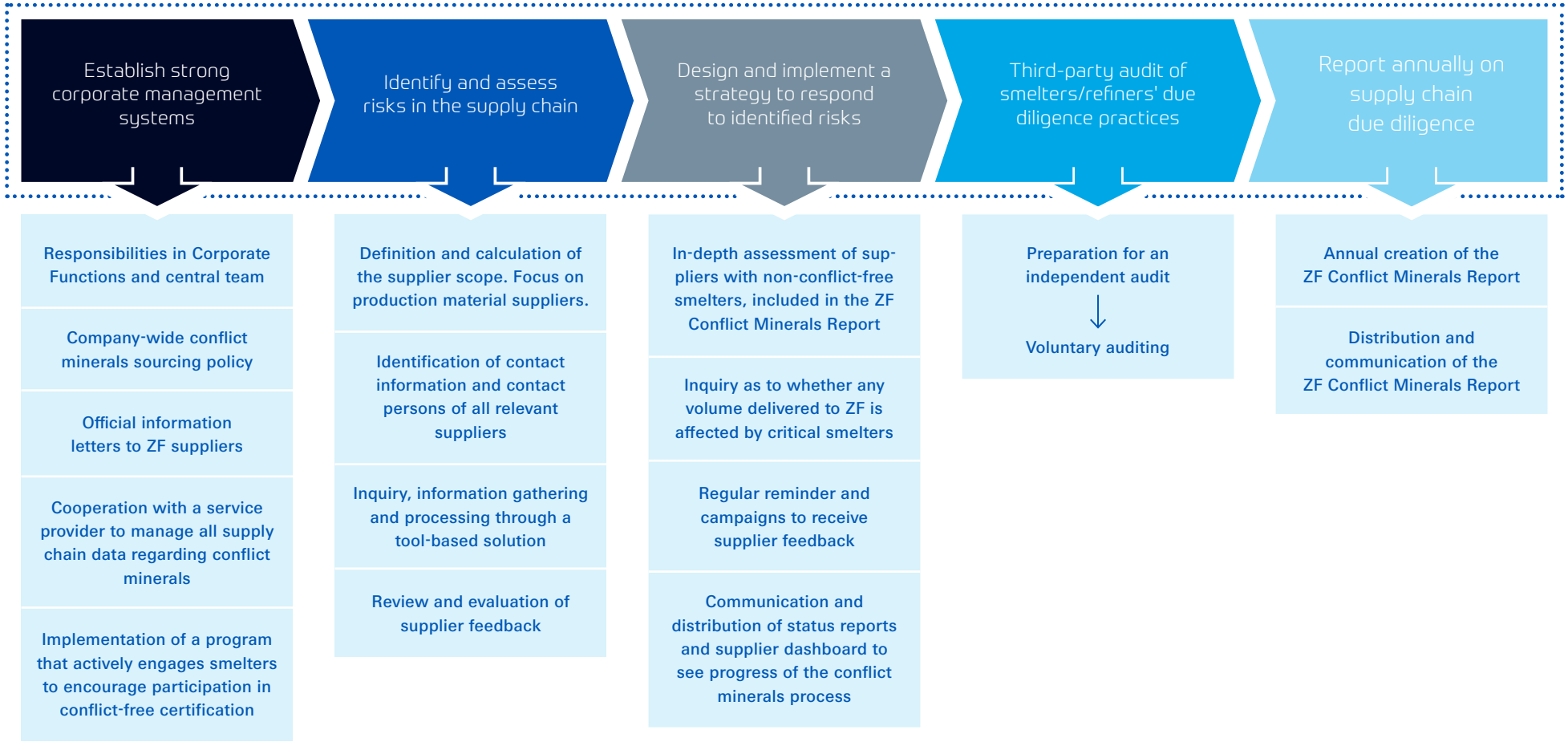
Gold, coltan, cassiterite, wolframite and its derivatives such as tantalum, tin or tungsten are referred to as conflict minerals because the mining and trading of these minerals may contribute to financing armed conflicts or human rights violations in some countries. Although ZF is not directly subject to the regulations of the "Dodd-Frank Act" (Sec. 1502) or to EU Regulation 2017/821, we take our responsibility seriously and commit ourselves to responsible 3TG procurement.

To this end, ZF requests that all relevant suppliers of production materials disclose the origin of their resources annually. The selection of relevant suppliers is based on a due diligence process aligned with ZF's corporate sustainability team and follows the OECD five-step approach. The annual conflict minerals reporting covers about 1,000 suppliers.

Since these minerals are necessary for technical functions in some of the company's products, ZF is fully committed to avoiding sourcing from potentially critical smelters. All relevant suppliers receive written notification explaining that ZF is committed to eliminating critical smelters from their supply chains. The Group requests that all suppliers remove possible or actual critical smelters from their supply chains. The response rate for the reporting year 2022 increased to 76% (2021: 63%) and we are intensifying our supplier engagement to further increase the feedback rate from suppliers.

In the current reporting year, 81% of smelters reported in the downstream supply chain are certified by the Responsible Minerals Initiative. Our goal is to continuously increase the percentage of certified smelters (conflict-free) in our supplier network.

ZF approach in line with the OECD Due Diligence Guidance for Minerals



Product Development

KEY FACTS

- **Calculation of the product carbon footprint to identify hot spots for prioritization of CO_2e reduction activities**
- **Ongoing digitalization improves quality processes and consideration of sustainability aspects during product development**
- **TISAX Vehicle Cybersecurity label at 100 certified locations worldwide**

The ZF Group's Next Generation Mobility strategy aims at ensuring clean, safe, comfortable and affordable mobility. Developing and establishing sustainable products is an integral part of this strategy. For further information, please refer to the **Basic Principles (Innovation)** of the ZF Group chapter of the Group Management Report.

The consideration of sustainable aspects in product development has a positive influence on the entire life cycle. ZF is therefore aiming to integrate these aspects already in the innovation phase but also to establish them in fundamental research and customer-specific applications. The life cycle of a product includes all activities from raw material extraction to the disposal phase. There are levers in each phase that can achieve significant improvements.

Since 80% of a product's environmental impact is determined in the design phase, ZF's product development approach includes a focus on improvements to the overall structure of products, types of connections and materials that have an influence on whether or not the product can be reused, repaired, remanufactured or recycled. For further information on ZF's remanufacturing activities, please refer to **Resource use and circular economy** chapter.

The influence on the product starts already with the selection of materials. ZF takes care to select technologies that produce as few emissions as possible in our upstream supply chain, but also promote the use of recycled and renewable materials. Another significant influence comes from the weight of a product, which causes emissions during the product's use phase.

One of ZF's strategic goals is to significantly lower mobility-related carbon emissions and specific product-related emissions. The specific target is to achieve a 40% reduction of Scope 3 emissions (in CO_2e per sales) by 2030 compared to 2019. Key performance indicators include product-related CO_2e reduction and product carbon footprints.

RESPONSIBILITIES AND GOVERNANCE

Sustainability in product development is a key objective of Research and Development (R&D) at ZF. The established R&D Sustainability Ambition team, which is centrally coordinated by corporate R&D, consists of divisional engineering leaders who are responsible for leading and promoting sustainable product development initiatives. The R&D Sustainability Ambition team's goal is to enable ZF product development to be sustainable-by-default, which is achieved when product development teams prioritize sustainability measures at the same level of importance as cost, performance and on-time delivery. This is enabled within the Group through tools, guidelines, standards and initiatives covering CO_2e reduction and circularity.

GUIDING POLICIES AND PRINCIPLES

In order to prepare ZF for upcoming regulations, corporate guidelines, etc. have been created, taking into account future directives. With the recent publication of the Group Directive "Global Development and Product Engineering Process (GDPEP 3.0)", ZF has integrated sustainability aspects as well as the CO_2e footprint calculation of a product into its global development process. All functions are required to contribute to improving the sustainability aspects of products.

These developed standards and tools are also considering the EU Ecodesign Directive. The company standard ZFN 9005 focuses on sustainable product design and provides recommendations for action to improve the ecodesign aspects of a product. This standard includes an assessment tool for essential aspects of circular economy as well as environmental protection and enables a design comparison, e.g., compared to a previous product generation.

In addition, monitoring prohibited and regulated substances is an important aspect not only of product compliance, but of implementing the concept of circular economy. Therefore, the company standard ZFN 9003 "Control of Prohibited and Regulated Substances" is also referenced in the GDPEP.

Product development initiatives

Product carbon footprints

The R&D Sustainability Ambition team's activities in 2022 can be categorized into four phases of maturity: learn, grow, standardize and embed – with the first three steps being key focuses in 2022.

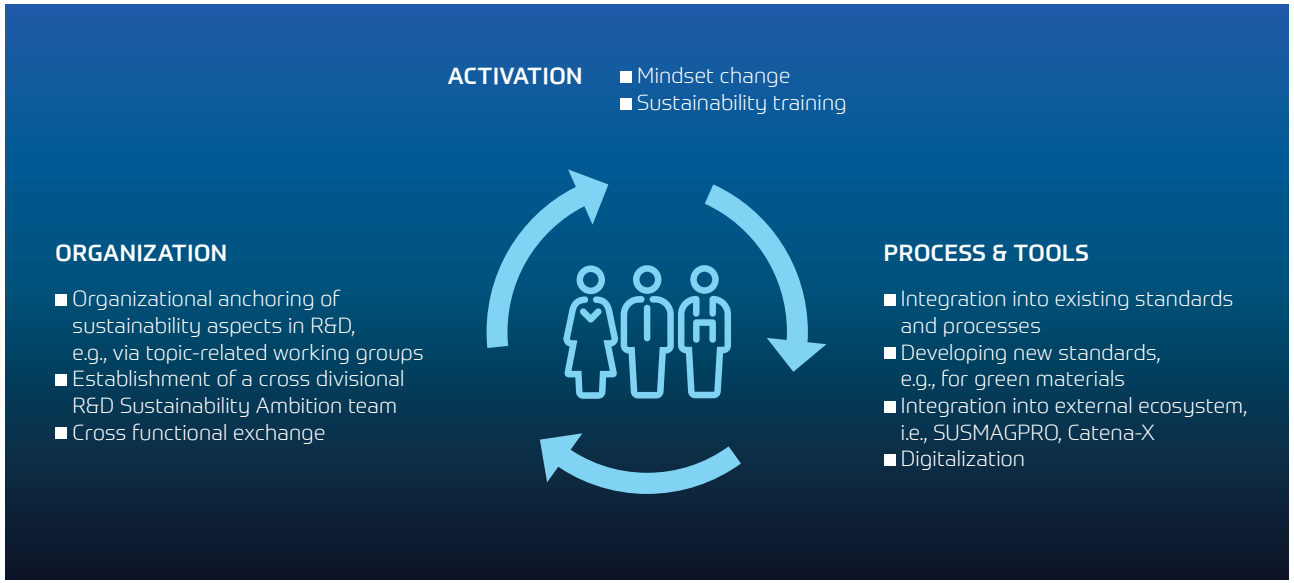
A key activity in 2022 has been to calculate the product carbon footprint (PCF). A product carbon footprint measures the total greenhouse gas emissions generated by a product from extraction of raw materials to the exit gate of ZF's manufacturing facility (cradle to gate) and is measured in carbon dioxide equivalents (CO_2e). In this context, the calculated PCFs serve as a basis for identifying significant CO_2e emitters and prioritizing CO_2e reduction measures. This is intended to support ZF in setting the right focus and designing internal processes accordingly. In addition, the CO_2e footprint of a product is used to offer sustainable products to our customers.

Green materials

The results of the PCFs were used to prioritize and internally steer the development of emission-reduced materials. One focus for reducing product-related emissions is the increased use of materials with higher recycled content. ZF aims to contribute to a circular economy and achieve the long-term goal of climate-neutral products. Based on ZF's total volume, a concept was developed to test and evaluate individual materials with increased recycling content, considering different manufacturing processes, as well as alternative materials with the aim of reducing CO_2e. As a result, ZF has defined a roadmap of material measures – including their relevance to results. The roadmap includes alternative material concepts and production routes for various main material groups on the basis of their CO_2e savings. Corresponding sub-projects were initiated to validate the resulting changes in material properties.

Among other things, studies were carried out on the performance of polymer recyclates in oil pans. These studies formed the basis for several projects, e.g., for recycling routes for ZF products. In the steel sector, progress was made in 2022 by investigating the effects of switching from blast furnaces to electric arc furnaces, particularly for sheet metal. For high-grade aluminum castings, the impact of accompanying elements was tested. Both projects, which will be continued in 2023,

Sustainable-by-default



require high capacities and intensive cooperation with suppliers. For further information, please refer to the ↘ **Resource use and circular economy** chapter.

Circular economy initiatives

ZF continues to participate in the EU SUSMAGPRO project (www.susmagpro.eu), which considers how to use rare-earth magnets based on neodymium-ironboron (NdFeB) recycled from motors at the end of their lifecycle. Designing products to allow efficient disassembly is one major key to this and one of ZF's main contributions to the activity.

Furthermore, ZF is also actively developing digital twin technology, for which a digital twin ecosystem is necessary to use its full potential. Among other aspects it covers data and requirement management. One of the focus areas is lean validation, where ZF works to substitute physical testing with virtual testing. This enables ZF to reduce the number of specimens and overall testing efforts, thereby enabling ZF to contribute towards sustainability and CO_2e reduction activities using digitalization. The ecosystem is currently being rolled out across all divisions. In the future, digital twin technology will enable ZF to evaluate its products and components for other benefits such as the remaining useful life of our products.

SAFETY AS A CORE COMPETENCY

Active safety systems can prevent accidents or mitigate their consequences. They assist drivers by monitoring the vehicle, issuing warnings and providing safety-relevant assistance. ZF systems are developed according to current safety standards – in particular the ISO 26262 standard for functional safety in road vehicles. We committed ourselves to their implementation in a corresponding internal directive. This also requires the performance of various hazard, error and risk analyses by safety managers. The objective is always to be able to present a reliable safety case so that a vehicle with the tested products installed will receive the required road release.

Our product development is regularly reviewed against the relevant standards to check compliance. To this end, ZF cooperates with renowned inspection agencies. Furthermore, an internal governance department was set up which, independently of product development, carries out reviews of safety plans, analyses and verifications, and participates in the release of safety reports. This Group-wide governance department also coordinates the further development of the processes involved and reports on the functional safety status in product development. It represents ZF in associations and actively contributes to the further development of, among other things, the ISO 26262 and ISO 21448 standards. In product development, we consider the Safety of the Intended Function (SOTIF) requirements according to the ISO 21448 standard. For us, these requirements are particularly relevant to highly complex sensors and autonomous driving.

In the event of field failures, ZF has internal processes in place to quickly evaluate the situation in a legally compliant manner, clarify questions and inform customers and, if necessary, the responsible authorities. Our employees are regularly trained to ensure that these processes are initiated immediately. These processes have proven their effectiveness over time, meaning that they can also be used for handling possible cybersecurity incidents.

Our employees working in the field of safety are trained at an internal training academy. The objective is to refresh and deepen knowledge in growing fields of technology such as functional safety. We established a functional safety expert team at Group level that organizes the further development of processes and a company-wide exchange of information.

Quality excellence strategy

ZF constantly strives to maintain the highest level of product quality despite increasing product complexity. This is supported by the certified ZF quality management system, consistent quality controls and regularly optimized processes. In addition, the company has established a Product Safety and Regulatory Office, which analyses, evaluates and tracks all relevant quality incidents and associated risks, and reports its findings directly to the member of the Board of Management responsible for quality.

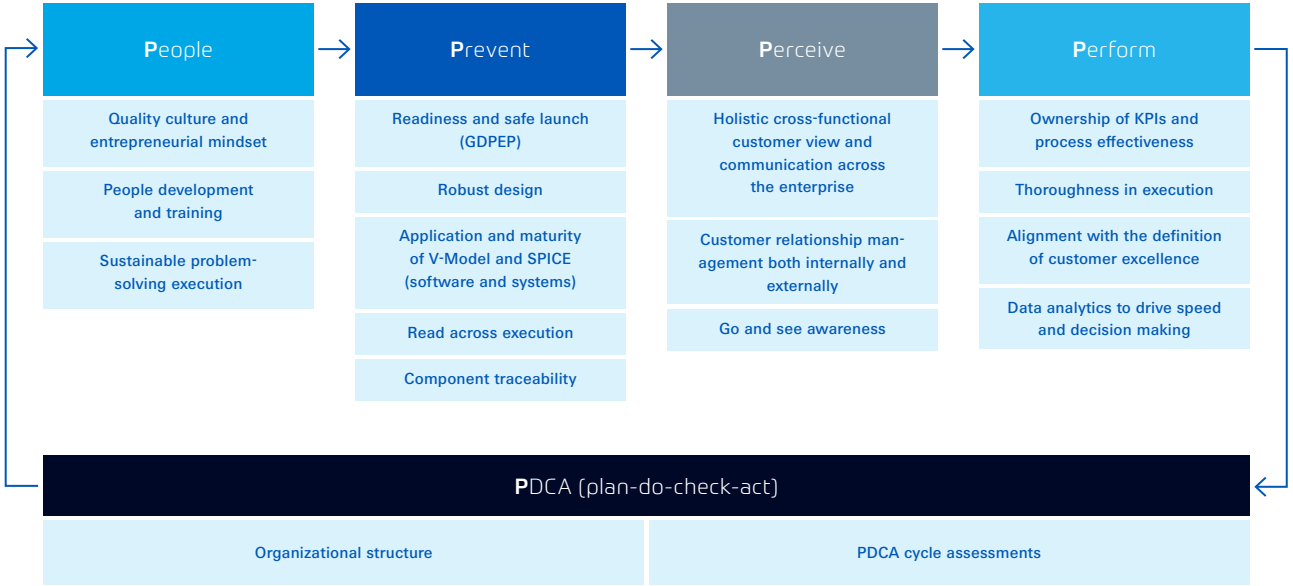
Within the framework of the "DNA of Quality" strategy, the Group promotes forward thinking at all levels and in all functions and associated processes. The "DNA of Quality" strategy is derived from the Group strategy and complements the ZF quality management system, which is based on the IATF 16949 framework for automotive quality management.

The core of this DNA consists of five principles which support a zero-defect philosophy: people, prevent, perceive, perform and PDCA ("plan-do-check-act"). Based on these principles, framework plans were created in cooperation with all divisions. These plans include individual excellence targets and related initiatives as well as a "DNA of Quality" assessment to determine the corresponding status of excellence. Increasing employee empowerment and motivation are key levers

for improving quality – this was shown by all winning projects of the ZF Excellence Awards in 2022.

The implementation of the quality excellence strategy is supported by a training portfolio jointly created by the Quality Function, the HR Department and the ZF internal quality academy. In 2022, measures focused on engineering quality and self-assessments based on the "DNA of Quality" approach were carried out. In addition, further ongoing digitalization has improved quality processes, reduced the risk of errors and lowered the costs of these errors.

ZF DNA OF QUALITY – Guiding principles



CYBERSECURITY FOR ZF PRODUCTS

Due to the increase in vehicle connectivity and the introduction of autonomous driving functions, cybersecurity has become even more important at ZF. In accordance with legislation and new standards, security aspects must be considered in product development. As an example, the applicable UN Regulation No. 155 on cybersecurity and cybersecurity management systems obliges vehicle manufacturers in Europe and other countries to implement a cybersecurity management system by 2024 at the latest.

The ZF-internal process for product cybersecurity meets the requirements of the ISO/SAE 21434 standard. Additionally, the comprehensive Global Development and Product Evolution Process (GDPEP) considers the core work packages of cybersecurity processes.

ZF's security policy illustrates the management's commitment to a special focus on cybersecurity, including in product development. The corresponding product development goal is to implement technology measures that prevent cyberattacks or make the perpetration of such attacks significantly more difficult. ZF conducts, among other activities, threat, risk and vulnerability analyses. Depending on the identified risk, appropriate measures are implemented. These include for example:

- Control unit software signatures check to ensure that they originate from authorized sources
- Authentication of diagnosis access to the control units, e.g., in workshops, by product development employees or for the analysis of return parts
- Access-proof filing of key and certificate material within the units
- Authentication of vehicle-internal data communication (ZF also uses microprocessors featuring co-processors with a specific focus on cryptography)

The effectiveness of these measures is confirmed by comprehensive security testing of our products. Electronic ZF products usually support software updates that enable troubleshooting in the field. When the vehicle architecture allows it, our products are increasingly capable of carrying out online updates in order to avoid workshop visits. For online updates in particular, the update process must be protected by cryptography-based safeguards to ensure that only authorized software is used in the control units.

In addition to the product evolution process, ZF has established a continuous event monitoring and incident response process in order to be able to respond

quickly and in a legally compliant manner to possible attacks on systems.

The Group also uses an in-house Red Team, whereby ethical hackers can attack ZF's products in order to find weak points or simulate external attacks. If a suspicion is confirmed that one of our products may have a weakness, this will trigger the corresponding response processes. These are similar to our product safety activities that allow us to quickly respond in a legally compliant manner, inform customers and, if necessary, the responsible authorities.

Our central team of cybersecurity assessors examines the security certificates required for product release and can independently confirm their compliance with ISO/SAE 21434. In 2022, ZF successfully underwent several assessments by external companies in the area of product cybersecurity confirming that ZF is well positioned compared to other companies in the industry.

For internal training, ZF has established an extensive program on product cybersecurity processes and technologies that is being constantly expanded and integrated into ZF's further training systems. Related topics such as technology subject to export controls, including cryptography, are also part of the widely rolled-out training measures. In 2022, a special upskilling program for product cybersecurity was started, with internal and external experts as trainers. This both gives internal employees attractive development opportunities and helps ZF to meet the fast-growing demand for cybersecurity talent.

Through its membership in the Automotive Information Sharing and Analysis Center (Auto-ISAC), ZF regularly receives new information about hacker attacks on products or technologies that are relevant to the company. In the event that third parties identify possible weaknesses in our products, ZF has set up an e-mail address that can be used to notify the Product Security Incident Response Team.

DIGITAL RESPONSIBILITY

At ZF, digital responsibility unites the aspects of product cybersecurity, production IT security, enterprise IT, information security and data protection in the company's business processes. The objective is to ensure the availability, confidentiality and integrity of ZF products, services and infrastructures. The same applies to the protection of data owned by partners, employees and ZF – regardless of storage location. Furthermore, the goal is to prevent external and internal cyberattacks such as information theft, manipulation and sabotage, and to increase the resilience of the supply chain against attacks. To this end, ZF has adopted binding guidelines for every aspect and for all employees. Key technical and organizational control measures include:

Preventive: Secure configuration of hardware and software, Security by Design, managed access to devices, controlled identity lifecycle and access management, patch and software management, threat and vulnerability management and creating a security culture through user awareness.

Proactive: Incident and crisis management, monitoring external threat landscape, on-site inspections, testing of service and data, red teaming and penetration tests, crisis management exercises and third-party management.

Reactive: Management of incidents and emergency situations.

An information security management system defines rules and procedures for improving information security. ZF's information security management system is in accordance with the ISO 27001 standard and is applied throughout the Group. The system undergoes a variety of independent tests at regular intervals. ZF obtained a TISAX (Trusted Information Security Assessment Exchange) Vehicle Cybersecurity label in 2022, covering development, production, operation and maintenance of its products. About 100 locations worldwide are TISAX certified. The label is based on the ISO 27001 standard and is specifically aligned with the security requirements of the automotive industry. The number of certifications is expected to increase continuously until 2024.

Data protection and privacy are increasingly important to all aspects of our worldwide business activities. This is true of both ZF's traditional business lines and its newer and more innovative businesses, such as intelligent cars and smart connected automotive components. Therefore, we constantly strive to make sure we exceed our data protection and privacy commitments to our customers, partners and staff. To this end, we apply rigorous security standards and privacy-by-design-and-default principles to our product development cycle from the outset.

As ZF continues transitioning its business model from traditional manufacturing to an increasingly digitalized and connected series of "smart" products, we remain aware of our responsibility for the increasing amounts of personal data generated by these innovative products and vigilant to the importance of protecting this data. We strictly implement and maintain industry-leading technical and organizational security measures to uphold the security, confidentiality, availability and integrity of the personal data that is collected. We anonymize and pseudonymize personal data where appropriate and we only collect and process personal data to the extent that it is necessary and only in connection with consent or a legitimate purpose. Through these measures we minimize the risks

posed by unauthorized access to the data embedded in these innovative new products.

As another way to further improve data security we inform and sensitize employees about the proper handling of company-related and personal data. In the yearly Security Awareness Weeks consisting of a wide range of information, learning materials and guest speakers, we enable our employees to protect data and react in situations of risk. In 2022, we focused on social engineering and the consequences in the event of an attack.

Furthermore, trustworthy artificial intelligence (AI) is a key element in promoting safety in a future world of autonomous mobility and will gradually make its way into all our products, services and business processes. Therefore, ZF has developed an ethics guideline that defines seven ethical key requirements when developing and applying AI technology.

With the operation of our Data Protection Management System (DPMS) we strive to ensure that data protection obligations are met, regardless of whether data relates to employees, partners or customers, and whether they are located in the EU or internationally. Our DPMS covers activities such as:

- Implementation of data protection and privacy standards in digital ZF products and services (privacy-by-design-and-default).
- Inclusion in contracts of stringent provisions regarding technical and organizational security measures where personal data is processed by third parties (such as cloud providers).
- Review of existing ZF contracts involving data processing to ensure they reflect current data protection and privacy standards (e.g., the inclusion of new standard contractual clauses) and remain aligned with the current regulations on international data flows.
- Provision of comprehensive organization-wide training measures to ensure personal data is always handled in a legal and compliant manner.
- Appointment of Data Protection Officers to coordinate data protection activities in specific ZF subsidiaries and divisions, supported by regional data protection coordinators.
- Utilization of regular internal audits and continuous quality improvement to ensure progressive incremental development of data protection operations, outcomes, systems, processes and compliance.

Understanding the importance of cooperation and standardization within the automotive data ecosystem, ZF is a founding member of the joint data platform of the automotive industry, Catena-X. This is an alliance of companies that uses a cloud to enable transparent, standardized and cross-company data exchange and to create a closely cooperating manufacturer and supplier network. ZF is represented on the Board of Management of Catena-X Automotive Network e.V. and the company's experts actively participate in its various working groups.

Additionally, the ZF Group Data Protection and Privacy team maintains close relationships with relevant national data protection supervisory authorities, as well as with industry data security bodies such as the German Association of the Automotive Industry (VDA). Through these relationships ZF ensures that its products and operations always meet or exceed the relevant data protection and security standards. It also means that ZF takes a proactive position in anticipating forthcoming changes which allows it to plan for the future expectations of its customers, suppliers and staff.

Business Conduct

KEY FACTS

> Launch of the Business Partner Integrity Management System
> Rollout of a new policy statement for product compliance and organization
> ZF Compliance Management System has been extended to include further sustainability aspects

The ZF Group has earned the recognition and trust of its customers through its responsible corporate governance and high-quality products and services. The aim is to further increase the company's commitment and the high esteem it has earned. We regard compliance as the foundation of successful corporate governance and therefore as a core value of our corporate culture. It supports reliable and respectful engagement with all stakeholders and thus forms the basis for lasting cooperation in an atmosphere of trust.

As a globally active company, ZF constantly works to ensure compliance with relevant laws, regulations and guidelines. This applies especially to the current substantial rise in regulations in the fields of climate protection and human rights. We promote honest, law-abiding and responsible behavior of employees at all levels and in all areas. This includes the respect of human rights, which is monitored in ZF's own operations and within its supply chain. Compliance regulations and guidelines, such as the ZF Code of Conduct, are made available to all employees via the intranet and to external stakeholders via www.zf.com. The current approach, which requires certain employees to sign the document, is under revision with the objective of strengthening the impact of the Code of Conduct and underlying compliance policies. The implementation of the updated process is planned for 2023.

Code of Conduct

The ZF Code of Conduct defines mandatory principles for correct and ethical behavior. It covers topics such as fair competition, human rights, anti-corruption activities, economic and social responsibility, product compliance, occupational safety and health, data privacy and transparency. As a core element of the ZF Compliance Management System (CMS), the ZF Code of Conduct is available in 27 languages and is sent to newly hired employees who undertake to comply with the Code in writing. In addition, employees receive information on how to ask questions about the ZF Code of Conduct and how to report possible violations. In addition to the ZF Code of Conduct, ZF has regulations and work instructions in place that primarily cover the following areas:

- Lawful and responsible behavior
- Ban on corruption
- Business partner integrity
- Handling favors, gifts and hospitality
- Correct behavior in competition
- Conflicts of interest
- Contacting the Corporate Compliance Office and reporting incidents
- Responsibilities, tasks and authority of the compliance organization
- Money laundering

The corresponding documents define and explain topics such as conflicts of interest or corruption. They clearly state that conflicts of interest, for example, are to be avoided and explain how this can be achieved. There is, for instance, a policy that prohibits sponsoring and donations that favor the following:

- Politicians and political parties, with the exception of donations made through political action committees (PACs) in the United States (these are in strict compliance with applicable law). Also, the distribution of such donations must reflect neutrality regarding parties and candidates. Payments to private accounts or in cash are prohibited.
- Individuals or organizations that are not charitable
- Organizations that discriminate third parties on the basis of skin color, gender, age, nationality, origin, religion, sexual orientation, disability or other legally prohibited grounds

Compliance management

The Compliance Organization was set up to reflect the organizational structure of the ZF Group. The ZF Compliance Management System is based on three pillars: prevention, detection and response. In 2022, it was extended to include further compliance aspects. It thus now focuses on preventing and investigating potential violations by employees and business partners in the areas of:

- Antitrust
- Anti-money laundering
- Corruption/bribery, including the handling of gifts and entertainment
- Conflicts of interest
- Data privacy
- Foreign trade

Three times per year the ZF Board of Management and the Audit Committee of the Supervisory Board are informed of all compliance-related risks via the Governance, Risk and Compliance (GRC) Report, including the progress made in refining the ZF Group Compliance Management System, details of significant completed investigations, known infringements of the law, sanctions imposed, and implemented corrective/preventative measures. All significant ongoing investigations are also reported to these bodies. Moreover, each substantiated investigation is reported to the member of the Board of Management in charge throughout the year. In 2022, 59 compliance allegations were investigated, of which 24 were substantiated. Measures were derived and included, e.g., through written warnings, terminations and process improvements.

The main objective of the CMS is to ensure compliance with internal and external regulations. To this end, it fulfills the following requirements:

- Independence and effectiveness of the Compliance Organization
- Integration of compliance into business processes
- Transparency of decision-making processes
- Respectively streamlined HR processes (sanctions)

As part of the continuous improvement of the CMS, the Compliance Department was staffed up during the reporting period. It was also decided to further develop the CMS in terms of responsibilities. Further enhancements to the Compliance Management System are being discussed with internal stakeholders and will be implemented in 2023. The effectiveness of the CMS is regularly examined, and its performance monitored continuously. The goal of the ZF Group for consolidated joint ventures is the implementation of ZF's own or a comparable CMS.

ZF Compliance Organization

Prevent	Detect and respond
Risk analysis	Reporting violations
Regulations	Investigation
Communication	Sanctioning misconduct
Training	Actions monitoring
ComplianceHelpdesk	Continuous improvement
Business partner due diligence	

Compliance tools

The ComplianceHelpdesk is a tool for systematically clarifying and documenting questions relating to compliance. ZF employees can contact the ComplianceHelpdesk whenever they are faced with a compliance-related issue in their day-to-day business activities.

The ZF CMS is complemented by the ZF Trustline, an electronic notification system for reporting suspected misconduct, anonymously if desired. Such incidents could be potential violations of competition and antitrust law, cases of corruption and bribery, conflicts of interest, product and regulatory requirements, anti-money laundering, data privacy, export laws, environment, health and safety regulations, fraud and financial reporting concerns, employment-related matters, violations of human rights and other material violations of policies or law. The system is available to all employees and business partners – and can be used anonymously. It supports German, Chinese, Portuguese, Spanish, Romanian, Czech, Italian, Turkish, Hungarian, French, Japanese, Korean, Polish, English and four Indian dialects (Hindi, Tamil, Telugu, Marathi).

In 2022, 255 notifications were received by the case management system, which comprises the ZF Trustline and other reporting channels. Of these, 162 cases were reported via the ZF Trustline and 93 cases via other internal channels. In total, 45 cases fell within the direct area of responsibility of the Corporate Compliance Function and resulted in 29 compliance investigations. 210 cases did not fall into the direct area of responsibility of the Corporate Compliance Function but were nevertheless processed and followed up in collaboration with the relevant ZF departments. Measures were derived where this was deemed necessary.

Compliance-relevant notifications (in scope)

	2022
Fraud	21
Bribery/Corruption	8
Conflict of interest	7
Others	9
Total	**45**

Business partners can pose a compliance risk if their actions or failure to act can be attributed to ZF. All business functions of the Group must therefore take appropriate measures – preferably before business relations with a partner are initiated – to ensure that business partners are adequately assessed and instructed. Moreover, to support the identification and mitigation of legal and other compliance risks, ZF has developed the Business Partner Integrity Management system. This is based on an integrated workflow that allows risk-based due diligence of ZF's business partners in an efficient, detailed and documented manner. It also allows them to be permanently monitored and has been designed to establish a clear definition of internal roles and responsibilities and to provide extensive coverage of risk areas, such as anti-money laundering, anti-bribery/corruption, human rights, personnel security, antitrust or sanctions, among others. The Business Partner Integrity Management System was launched in November 2022, starting with a pilot in China until March 2023 – particularly focusing on new suppliers of non-production materials. From this point on, we will be following a rollout plan to gradually integrate new suppliers from other countries, existing suppliers, other commodities and customers, and are expecting full inclusion of all ZF business partners by June 2024. This rollout will be supported by the respective communications to all company levels and training for internal stakeholders.

Sharing news and information about compliance issues in internal communication channels helps to raise awareness among employees. In addition, the company's values and expectations regarding employee business conduct are communicated regularly. A range of communication measures ensures that compliance is firmly anchored within ZF's corporate culture. All employees, including the Board of Management, have constant access to a large variety of compliance topics and training measures through the intranet, the Compliance communities and other channels. As the main communication channel, the intranet also offers employees information on compliance contacts and access to important documents.

Compliance and antitrust training

Due to its large employee base, ZF puts a strong focus on topic- and target group-oriented online training units. The objective of these online courses is to firmly anchor compliance in employees' minds, create and enhance awareness, provide useful guidance and thereby prevent wrongdoing. This training conveys knowledge and promotes employees' ability to act in critical situations. By the end of 2022, the following courses were completed (with regard to the target groups) via the myHRSuite (MHRS) online learning management system:

- ZF Code of Conduct: 57,570 participants
- Conflicts of Interest: 52,972 participants
- Ethical Leadership: 12,453 participants
- Recognizing and Avoiding Bribery: 47,176 participants
- Business Integrity and Fraud: 24,417 participants
- General Antitrust Law Training: 22,168 participants

The MHRS enables all employees to independently track their training progress. In addition, an escalation process for mandatory training was established in cooperation with the HR Department. Employees can also use the intranet independently and on a voluntary basis to obtain information on many topics. Training in other formats, such as in-person training on key topics, is provided in a targeted manner based on region, job function and risk category.

Product compliance

The conformity of our products and services with applicable regulatory requirements is a top priority for ZF along its entire value chain. To secure a robust approach, the Board of Management tasked a cross-functional and cross-divisional team in 2020 to assess existing procedures and elaborate the product regulatory compliance efforts into an effective and efficient product compliance management system (PCMS). In 2022, the new policy statement for product compliance and organization and the related processes were rolled out across the Group to guide our technical teams on the product-related regulatory topic. To enforce product compliance among all employees, PCMS training is available on a voluntary basis and is compulsory for relevant functions.

Compliance with tax regulations

The ZF Group's tax strategy was developed as part of ZF's corporate responsibility and in line with the company's overall corporate strategy. The tax strategy is aimed at meeting the following criteria:

- Compliance with tax regulations to ensure that tax returns are filed correctly and on time
- Ensuring that taxes are paid in the countries where value is added, thereby avoiding aggressive tax planning
- Ensuring that tax information used for corporate decisions and intended for the publication of financial data is correct and relevant
- Introducing appropriate measures to minimize tax risks and avoid unexpected tax payments
- Upholding ZF's positive reputation as a responsible company that respects tax laws
- Preventing inefficiencies from a tax perspective, such as double taxation

Taxes – Values & Principles

ZF is committed to an open and transparent exchange of information with tax authorities. It advocates fair and practical legislation, supports the work of industrial associations and international organizations in the field of tax law, and contributes towards ensuring transparent and responsible taxation.

Responsible conduct in tax matters

The basis for effective tax management is a clear definition of roles and responsibilities with regard to tax processes, measures and structures. ZF's Tax Function is set up along the lines of an organizational matrix structure and is tailored to the operational needs of the business organizations, such as corporate functions and divisions, and ensures a clear assignment of tasks, rights and responsibilities within each region.

Roles and responsibilities have been defined primarily in the following areas:

- Policy-making competence
- Requirement for involvement of the Tax Department
- Requirement for involvement of or prior approval by the Tax Function
- Responsibility for tax-relevant elements in ZF's business processes
- Implementation and further development of the process for ensuring compliance with tax regulations

Within the Board of Management of the ZF Group, the responsibility for taxes lies with Corporate Finance, IT and M&A, and is managed by the Chief Financial Officer (CFO). The Group Tax Function, directly reporting to the Head of Corporate Finance or the Group's CFO, is responsible for compliance with the tax strategy. Tax compliance measures are executed by centralized local tax functions. These are either part of the tax function of a larger region or are organized at the local finance function level. General definitions are embedded in ZF's respective management policies in order to make sure that all Group entities adhere to these principles.

ZF ensures that taxes due are determined according to local tax laws and that internal transfer prices within the ZF Group are set in accordance with the arm's-length principle. Remuneration for intra-Group transactions is generally based on the fair market value of the individual transaction.

Tax risk management

ZF seeks to minimize tax risks. The ZF tax risk management and the tax control framework are consistent with and embedded in the Group's Enterprise Risk Management and internal control framework. Tax risks are actively and continuously identified, assessed, monitored and managed. This ensures that they remain in line with the overarching objective of the Tax Function to guarantee Group-wide tax compliance.

Effective tax risk management and tax compliance are ensured by the following measures:

- Tax guideline concept integrated in ZF's policy management structure
- Continuous monitoring and improvement of the tax control framework via an established TAX CMS lifecycle process
- Verification of compliance with tax rules in the context of the confirmation and issue reporting process integrated in the Group's internal control system
- A structured approach to monitoring and assessing potential tax risks
- Digital reporting system ZF Trustline available to internal and external stakeholders

Country-by-country reporting of tax and other key figures

In compliance with the base erosion and profit-shifting (BEPS) actions of the OECD, ZF prepares a country-by-country report (CbCR) for the entire ZF Group; this is provided to the German tax authorities on an annual basis. In turn, the German tax authorities share ZF's CbCR with countries that have signed a corresponding agreement permitting this data exchange. ZF's CbCR is therefore available to all countries whose tax authorities have agreed to the OECD standards. The information on CbCR according to GRI 207-4 does not correspond with the requirements for the aforementioned CbCR according to BEPS regulations. GRI 207-4 CbCR information consolidated by country or rather by tax jurisdiction is not available.

Ongoing tax payments by region

in € million	2022	2021	2020
Europe	62	67	30
North America	26	32	33
Asia-Pacific	212	200	127
Other	26	17	6
Total	**326**	**316**	**196**

Group Management Report

Basic Principles of the ZF Group

OPERATING ACTIVITIES AND STRUCTURE

- **Internationally positioned: ZF is a globally active technology company.**
- **Focus on the future: ZF electrifies vehicles and contributes to reducing emissions.**
- **Main sales markets: Europe, North America and the Asia-Pacific region.**

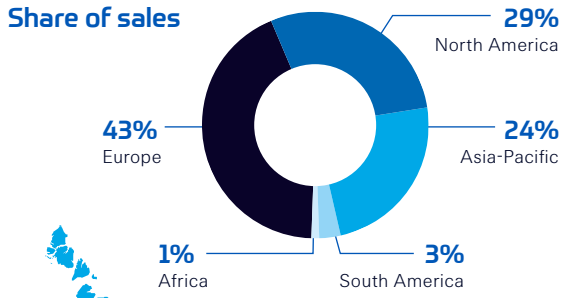
Global technology solutions provider focused on mobility

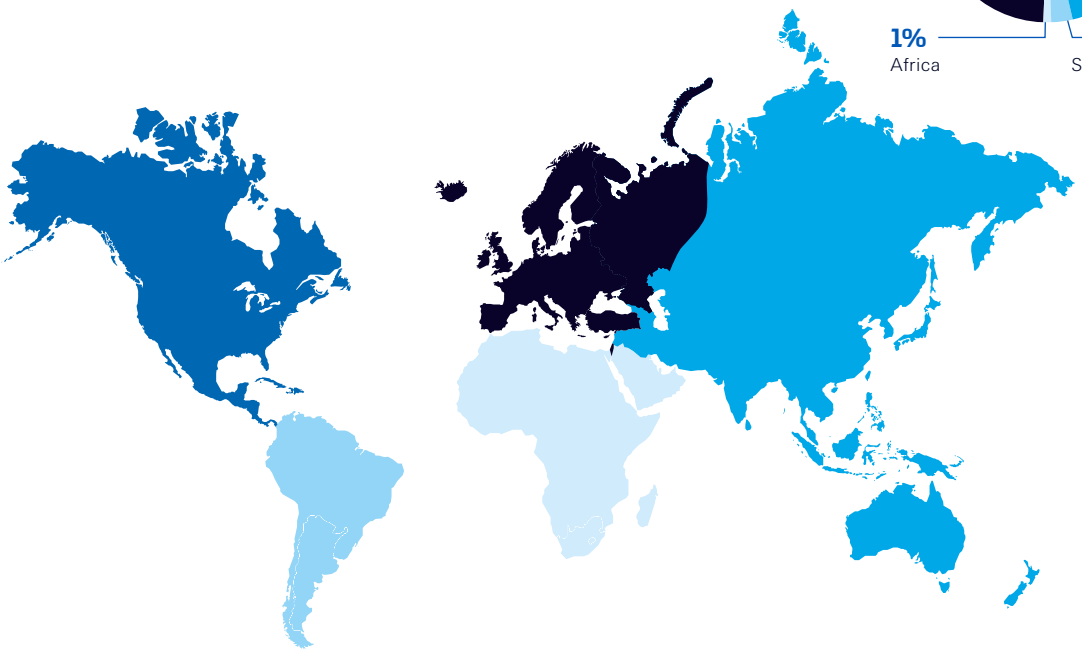
ZF is a global technology company supplying advanced mobility products and systems for passenger cars, commercial vehicles and industrial technology. Our comprehensive product range is aimed primarily at established vehicle manufacturers, mobility providers and start-up companies in the fields of transportation and mobility. ZF electrifies a wide range of vehicle types. With its products, the company contributes to reducing emissions, protecting the climate and enhancing safe mobility. Alongside our core markets – passenger cars and commercial vehicles – we also serve market segments such as construction and agricultural machinery, wind power, marine propulsion, rail drives, special drives and test systems. We sell our aftermarket products under the brands of ZF, Lemförder, Sachs, TRW, WABCO and Boge.

At the end of 2022, ZF employees worldwide numbered around 164,900. The ZF Group is represented with 168 production locations in 32 countries. Our main sales markets are Europe, North America and the

G. 01 ZF worldwide

168 production locations in **32** countries
19 main development locations in **9** countries
Global service network with more than
15,000 workshop partners





	Total	Europe	North America	Asia-Pacific	South America	Africa
Production locations	**168**	82	35	38	9	4
Employees	**164,869**	93,706	35,307	29,454	5,592	810
Sales 2022 in € million	**43,801**	18,717	12,487	10,689	1,432	476

Region of Asia-Pacific, with China as the core market and India as the growth market.

A focus on 4 plus 1 technology fields

We strategically focus on four technological fields, systematically combining them through integrated solutions: Electric Mobility, Vehicle Motion Control, Automated Driving and Integrated Safety. These fields are supplemented by digitalization and the networking of our products with the help of software.

Corporate structure

ZF Friedrichshafen AG is a corporation headquartered in Friedrichshafen (Germany). The Zeppelin Foundation owns 93.8% of the company. These shares are managed by the city of Friedrichshafen. The remaining 6.2% is owned by the Dr. Jürgen and Irmgard Ulderup Foundation, Lemförde (Germany). The shareholders exercise their voting rights at the ordinary annual shareholders' meeting and/or at extraordinary shareholders' meetings that are held upon requirement.

In order to manage our business activities as customer-oriented, market-specific and innovative as possible, we are working in a global network consisting of divisions, regions and corporate functions. The corporate functions and divisions are managed by the Board of Management. The same applies to the responsibilities with regard to the Regions of North America, South America, Asia-Pacific and India. The regions provide local guidelines as well as corresponding services for the business activities in their regions.

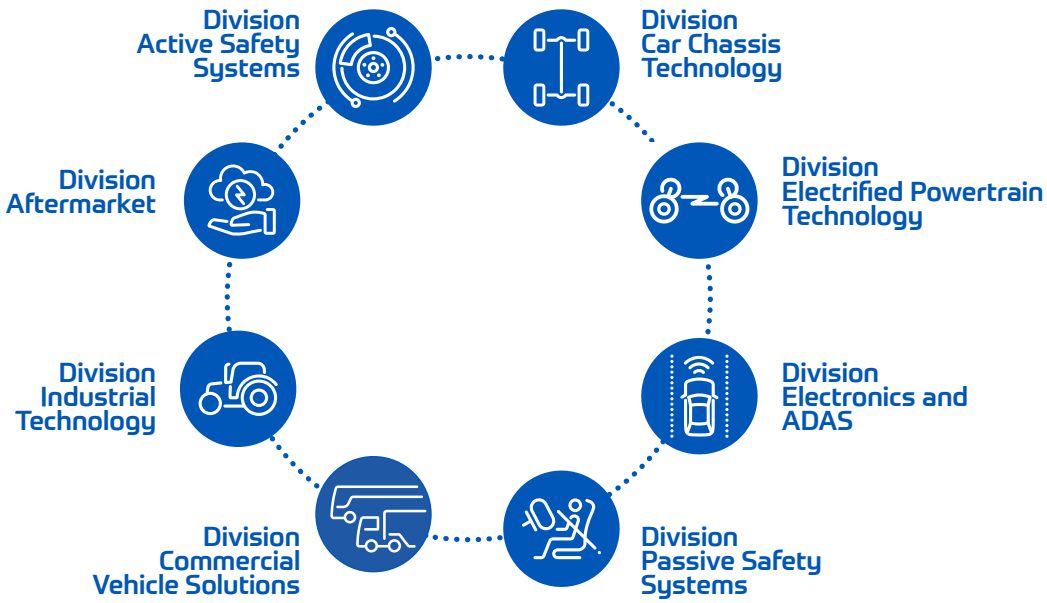
In the ZF Group, business activities by product segments are organized by divisions. The divisions Active Safety Systems, Car Chassis Technology, Electrified Powertrain Technology, Electronics and ADAS as well as the Passive Safety Systems Division operate in the passenger car and light commercial vehicle sector.

On January 1, 2022, ZF announced the launch of its new commercial vehicle division: Commercial Vehicle Solutions. The new division pools expertise in the commercial vehicle industry and will significantly promote solutions for safe, sustainable and digitalized transport. The new division combines the previous ZF divisions Commercial Vehicle Technology and Commercial Vehicle Control Systems, which resulted from the acquisition of WABCO by ZF in May 2020.

Activities in the area of industrial applications are pooled in the Industrial Technology Division and include market segments such as construction and agricultural machinery, wind power, marine propulsion, rail drives, special drives and test systems.

The Aftermarket Division makes our OEM expertise available to the aftermarket, drawing on a global service network of more than 15,000 workshop partners. Our offers include services for fleets, exchange units and maintenance as well as intelligent connectivity solutions for digital mobility management over the entire life cycle of a vehicle. In addition to retrofitting and upgrades for more efficiency, comfort and safety, we also offer a constantly growing portfolio in the field of remanufacturing. In order to optimally prepare our workshop partners for the mobility of the future, we also provide them with our technical know-how in the context of workshop concepts.

G. 02 Divisions



CORPORATE MANAGEMENT

> **Continuity despite change in leadership: Member of the Board of Management Dr. Holger Klein becomes Chief Executive Officer.**
> **Supervisory Board defines new target figures for the share of female leaders in top management levels.**

Board of Management

ZF Friedrichshafen AG and the ZF Group are led by the Board of Management, which runs the business independently and sets the company's strategic direction. The strategy is implemented in close coordination with the Supervisory Board. The Supervisory Board monitors the activities of the Board of Management and receives regular management updates concerning business performance, strategy and opportunities and risks.

In line with our matrix organization, in addition to strategic and functional management, the Board of Management has responsibility for the divisions and regions.

In the 2022 fiscal year, the Board of Management comprised seven members: Chief Executive Officer Wolf-Henning Scheider, Dr. Konstantin Sauer, Dr. Martin Fischer, Sabine Jaskula, Dr. Holger Klein, Wilhelm Rehm and Stephan von Schuckmann.

In July 2022, the Supervisory Board appointed Dr. Holger Klein to succeed Wolf-Henning Scheider, who left the company at the end of 2022. Dr. Konstantin Sauer and Wilhem Rehm retired on December 31, 2022, after many years of work.

On December 1, 2022, Michael Frick joined the Board of Management and assumed the duties of Dr. Konstantin Sauer as Chief Financial Officer as of January 1, 2023. Also with effect from January 1, 2023, Dr. Peter Laier became a new member of the Board of Management, taking over from Wilhelm Rehm as head of the Commercial Vehicle Solutions und Industrial Technology divisions. Dr. Laier is also responsible for Corporate Production and the region of India.

Supervisory Board

The Board of Management is overseen by the Supervisory Board, whose members are appointed with equal representation. In the fiscal year, the Supervisory Board comprised 20 members under the leadership of Dr. Heinrich Hiesinger. The Supervisory Board is supported by an Executive Committee and an Audit Committee, which are both composed of members of the Supervisory Board.

Corporate Governance

The Board of Management and the Supervisory Board are committed to managing and monitoring the company responsibly in accordance with the principles of good corporate governance. These are a prerequisite for sustainable business success and the fundamental standard on which our day-to-day management behavior is based. For the Group, acting according to the principles of responsible corporate management geared to sustainable value creation is an all-encompassing requirement across all areas of the company. Corporate Governance is implemented by means of an integrated governance, risk and compliance (GRC) approach. The aim of the integrated GRC approach is to synchronize and promote the activities and cooperation of the core governance functions. In addition to Group Risk Management, this system includes the Compliance organization, the internal control system, and as an independent supervisory body, Corporate Audit. The departments report regularly to the Board of Management and Audit Committee in a joint GRC report.

Enterprise Risk Management

The Group-wide standardized Enterprise Risk Management (ERM) of ZF Friedrichshafen AG ensures the monitoring and management of risks in the divisions, functions and regions as part of decentralized risk management. Our risk situation is now more transparent. We document, monitor and manage risks with the help of various tools, taking account of both strategic and operational risks and aggregating the overall risk landscape.

Compliance

Compliance is an integral part of our corporate culture and forms the basis for the trust that customers, business partners and the public put in us. The Board of Management and all employees of the ZF Group are obliged to behave responsibly and to comply with applicable regulations. We expect such behavior also from our business partners along the entire value-added chain.

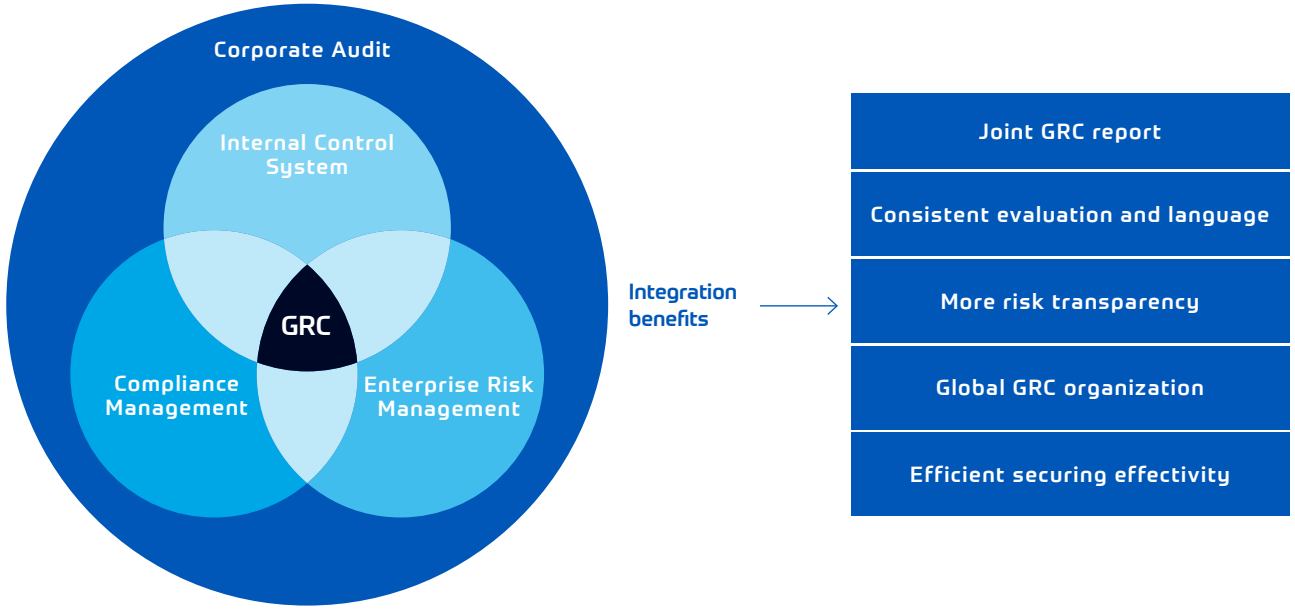
ZF's Code of Conduct lays down principles of correct, legally compliant and ethical behavior that are mandatory for all ZF employees. In addition, the Business Partner Principles form the foundation of cooperation based on partnership. They include the requirements and expectations of the ZF Group vis-à-vis its business partners. The Code of Conduct and the Business Partner Principles represent the basic requirements to act with integrity and summarize the ZF Group's understanding of values.

The ZF Compliance Management System ensures lawful action by the bodies, executive managers and employees at all corporate locations. The focus is on measures preventing corruption, fraud and money laundering risks. These activities include internal compliance regulations, communication and training measures, complaint and case management and a compliance reporting system.

Internal control system

ZF's Internal Control System (ICS) aims to guarantee that we achieve our objectives in terms of relevant business activities, reliable reporting on financial as well as non-financial key figures and compliance. The direct reference of the ICS to the ZF risk catalog enables us to ensure and further develop the ICS coverage in a targeted manner. Our standardized ICS method applies company-wide and has been implemented throughout the Group. It is based on the tenets of transparency, the principle of dual control and the separation of duties. Control procedures and documentation as well as the prompt elimination of identified weaknesses are monitored.

G. 03 Benefits of integrated Governance, Risk & Compliance (GRC)



Corporate Audit

ZF Corporate Audit supports the ZF Group in achieving its objectives by following a systematic and independent audit approach to evaluate and improve the effectiveness and efficiency of risk management, control and other governance processes related to the ZF risk catalog. The audits and audit-related consulting services are provided on the basis of risk-based audit planning approved by the Board of Management. Corporate Audit monitors the timely implementation of measures agreed on the basis of identified risks.

Equality and equal opportunities

Equality and equal opportunities are vital for our company's success. We support the wide variety of social cultures in our company and nurture our employees regardless of their personal attributes. ZF promotes an integrative working environment and an open work culture that respects, values and encourages individual differences.

With due consideration for German legislation governing equal representation of women and men in managerial positions in the private and public sectors, the Supervisory Board has set the target percentage of women to 10% on the Board of Management, 20% on the Supervisory Board and 15% on both the first and second managerial level below the Board of Management as of June 30, 2022.

With Sabine Jaskula as member of the Board of Management for the HR and Legal Corporate Function, this target has been met by the Board of Management. As a target for June 30, 2027, the Supervisory Board has

determined that the Board of Management must have at least one woman as a member.

As of June 30, 2022, the Supervisory Board had three female members, which meant that the target of four female members was not achieved. The reason for this was the employee representatives' voting results in the last Supervisory Board election. For June 30, 2027, the Supervisory Board has defined a target of at least three female Supervisory Board members on the shareholder side and four female Supervisory Board members for the entire Supervisory Board. The target is expected to be achieved with the new appointment of the Supervisory Board in mid-March 2023.

At the first managerial level below the Board of Management (executive vice president / senior vice president) and the second managerial level (vice president), a share of women of 14.5% and 11.2% was achieved, respectively, as of June 30, 2022. While progress was made at the first managerial level, the overall targets were however not achieved. This is mainly due to the transformation throughout the automotive industry and the related long-term restructuring program for cost reduction and the adaptation of structures. As a target figure for June 30, 2027, the Board of Management has decided that the share of women at the first and second managerial levels below the Board of Management is to be at least 20%, respectively.

↘ For further information, refer to the Sustainability chapter.

INNOVATION

> **Focus on innovations maintained.**
> **ZF identifies key technologies and accelerates their development.**

Goal: Next Generation Mobility

The automotive industry is going through a period of unprecedented upheavals. In addition to the technological transformation towards e-mobility and automated driving, there were many other challenges in 2022: the continuing impact of Covid-19, the semiconductor shortage, the war in Ukraine, the resulting uncertainty in terms of energy supply – especially in Europe – and rising inflation. Despite these challenges, ZF's focus on innovation has not changed. ZF set the strategic course and is working on key technologies that enable the major mobility trends: software-defined vehicles, electrified drivelines, artificial intelligence and autonomous driving.

ZF invests in innovations that encompass the following four subject areas. This is how the technology company will achieve the strategic goal of Next Generation Mobility:

- Vehicles and their systems:
  Vehicles are increasingly defined by system functions. Within this cluster, we are developing the necessary E/E architectures and software methods as well as the structure of these system functions.
- Digital products and data handling:
  We have further developed our data handling & analytics clusters to enable and accelerate software as a service (SaaS) and software as a product (SaaP). Access to data and its reuse in the cloud through artificial intelligence algorithms are further advanced.
- Efficient use of energy:
  The range of electric vehicles not only depends on the battery capacity, but also on their efficiency. We are working on efficient drives and efficient energy management. Therefore, we are researching and developing opportunities, for example, to improve the conversion of energy, including systematic algorithms for an optimized driving strategy. We see great potential for new semiconductor technologies, especially in 800-volt power electronics.

T. 01 Research and development figures

	2022	2021	Change
R&D expenditure in € million	3,425	3,060	+11.9%
R&D expenditure ratio in %	7.8	8.0	–0.2% pts.
Number of invention disclosures	2,812	2,624	+7.2%
Number of R&D employees	26,140	23,750	+10.1%

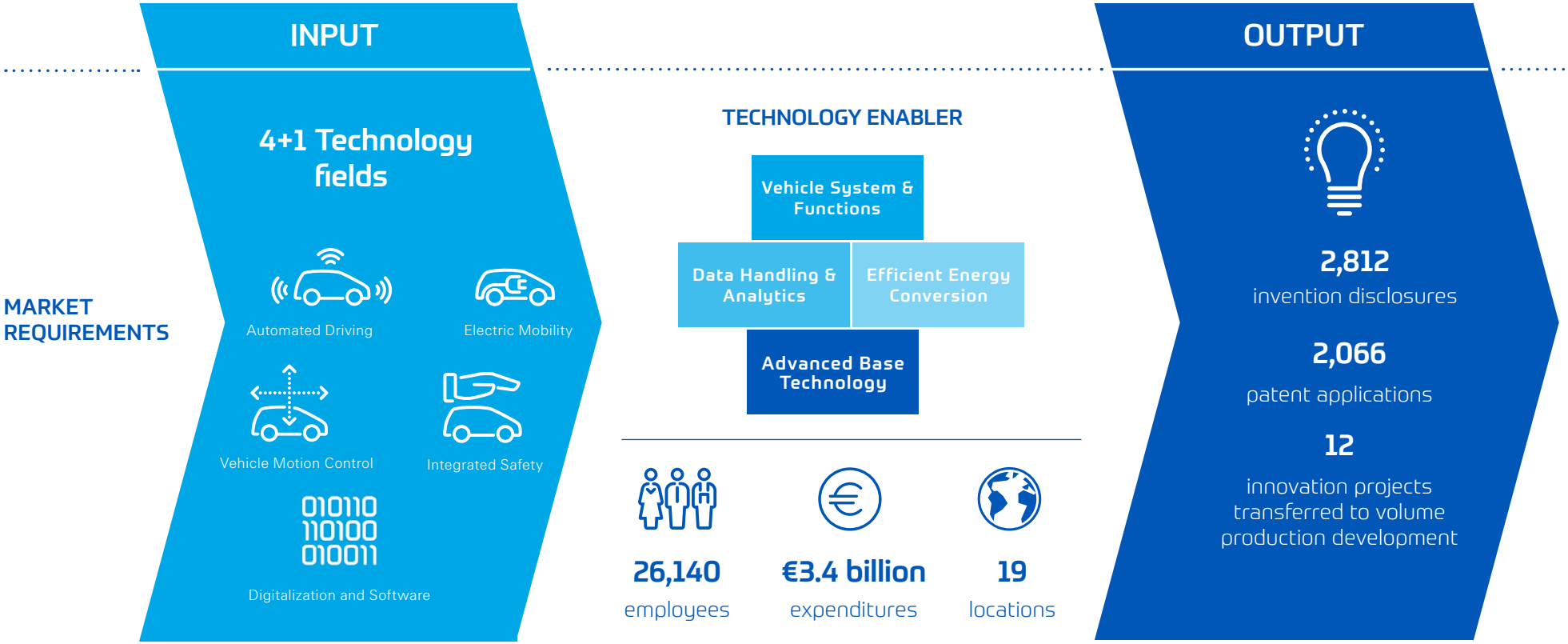
- Modern key technologies:
  In this cluster, we focus on the fundamental technologies that enable complex, cutting-edge vehicle functions, for example high-resolution sensors, artificial intelligence and powerful central computers.

These four technology areas comprise around 20 topics which then again contribute to the development of key technologies. In 2022, we focused in particular on advancing the development of software-defined driving functions. The progress made in middleware, Function Development Kits (FDKs) and DevOps rollout played a central role here.

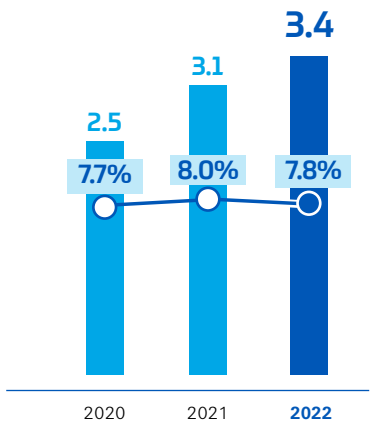
R&D expenditure remains high

In the fiscal year 2022, ZF invested €3.4 billion (2021: €3.1 billion) in research and development. This corresponds to a sales share of 7.8% (2021: 8.0%). Research and development expenditure is defined as research and development costs in accordance with the statement of profit or loss, plus capitalized development costs, less their depreciation.

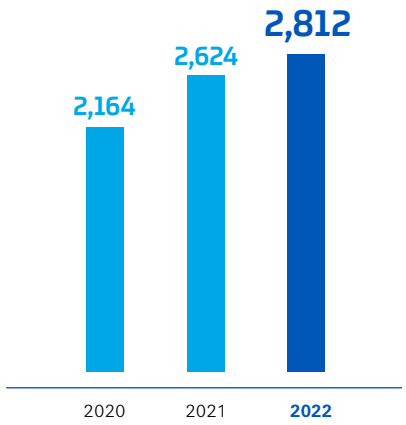
G. 04 Technology strategy



G. 05 R&D expenditure
in € billion / share of sales in %



G. 06 Invention disclosures



In the past fiscal year, the Group employed around 26,140 people in research and development (2021: around 23,750). Around 5,570 employees (2021: around 4,400) work in the Group's basic research and divisional project development departments. ZF has 19 main development locations worldwide. In addition to Friedrichshafen, Koblenz, Schweinfurt, Alfdorf, Hanover, Düsseldorf, Stemwede, Passau and Auerbach in Germany, these are in Hyderabad and Chennai (India), the Detroit metropolitan area (USA), Shanghai (China), Częstochowa and Wrocław (Poland), Plzeň (Czech Republic), Solihull (UK), Timișoara (Romania) and Yokohama (Japan). In addition, our R&D has established two multidivisional development locations in Guangzhou (China) and Monterrey (Mexico).

Patent applications

In the year under review, a total of 2,812 invention disclosures (2021: 2,624) were filed by the Group. The filings led to 2,066 (2021: 1,862) new patent applications.

Contribution to the innovation portfolio

In the area of electric mobility, ZF worked continuously on the volume production implementation of the e-Drive platform for electrified drives. It contains not only components and the associated software platform, but also a total system solution. In addition, the pre-developed software platform plays a central role for e-mobility solutions. This can shorten development times and generate a high maturity level already in early project phases as well as provide maximum cost efficiency for our customers.

With the formation of the new Commercial Vehicle Solutions (CVS) Division and the associated integration of the CVS product portfolio, ZF can unlock new innovation potential for the commercial vehicle and transport sector.

We are developing new automation functions for commercial vehicles at the depot and in public transport. Examples include the automated coupling and uncoupling of semitrailers, autonomous maneuvering to the loading bay as well as a stop assistant for emergency situations. In our opinion, tractors and semitrailers are becoming more and more interconnected. New and faster data lines are needed for this purpose, which also have to meet increased cybersecurity requirements.

In the transport sector, ZF is positioning itself as an innovative service provider with SCALAR, a new orchestration platform for fleets. A wealth of condition information from our systems in the vehicle serves, for example, to enable condition-based maintenance, to avoid sudden failures and breakdowns, and to use the drive energy in the best possible way for the respective driving task. The load condition, the topography of the route and many more pieces of information are considered in this regard.

In the commercial vehicle segment, ZF developed an innovative portfolio for electric drives whose components can be used in almost all truck and bus applications. We also presented a locally emission-free drive solution for semitrailers with an electrically driven axle. We believe that this, combined with combustion engine tractors, creates plenty of potential for recovering braking energy and providing tractive force support. Initial studies show potential for reducing CO_2 emissions by up to 16% in short-distance operations and up to 7% in freeway driving. For long-distance trucks, ZF expects a greater penetration of fleets with fuel cell systems. To this end, ZF plans to consistently expand its existing drive system know-how towards the fuel cell system.

In our opinion, innovations such as the heated seat belt have great potential because they offer more range for electric vehicles along with greater occupant comfort. We also see steering wheels with extended HMI functions as of central importance for the next generation of vehicles.

Global presence further expanded

ZF opened a new technology center in Hyderabad (India) in June 2022. With the technology centers, we are increasing our global presence and promoting technical quality and efficiency in research and development.

The new technology center will now also be home to an innovation lab. After the initial virtual implementation of the innovation hub, the innovation lab was officially opened in fall 2022, creating preconditions to continuously promote innovation for the global and, in particular, the Indian market.

In 2021, ZF launched the expansion of the Timișoara location to a multidivisional development location with a focus on active safety technology, electric mobility and software. In our opinion, the location developed very well in 2022 and the number of experts was almost doubled. Furthermore, a strategic cooperation agreement was signed with the University of Timișoara. A drive event was organized to highlight and showcase ZF technology in a Formula E car to the students and the public.

In 2022, the Centers of Competence (CoCs) were restructured and realigned within Corporate Research and Development. The twelve CoCs are thematically linked to the four strategic technology areas. The tasks of the CoCs are global and quite diverse: They range from technology scouting and evaluation to supporting volume production projects. The Digital Product Platform CoC, for example, was remodeled with the aim of accelerating the application of cloud solutions and the launch of digital products. Apart from focusing on innovations and new technologies, the CoCs also play a central role when developing new platforms, modular kits and standards. They additionally support the rollout and application of these products.

Digitalization of R&D processes

The vision of seamlessly linked, digital product development focusing on added value was consistently pursued. Here we launched initiatives that specifically contribute to simplifying, modernizing and accelerating our processes. For example, the development of our broad product portfolio is simplified by shared systems and tools and accelerated by the further rollout of digital product twins and virtual validation methods. Strategic tool chains and virtual release methods are further steps along this path.

Software first, digital always

Any new function that uses the Function Development Kit (FDK) concept for development can easily be integrated into any middleware. Functions deployed in the middleware form an interface to the smart actuators. This makes the functions flexible in terms of scalability and upgrades. The functions are therefore independent of the hardware components.

FDK enables a function to act as software as a product (SaaP) by creating interfaces in a specific format that can be used for transfer to any middleware. The middleware integrates functions via FDK, independent of the hardware and the operating system, and serves as a basis for the development of additional digital products and services. In 2022, the ZF middleware reached its first integrated version; it currently covers signal-based and service-oriented communication. In prototypes, the middleware demonstrated the ability to migrate AUTOSAR Classic functions to HPCs (high-performance computers) such as ZF VMD or ProAI with different systems-on-chip (SoCs).

Our DevOps platform provides processes, methods and tools for the combined development of onboard and cloud-based functions. The rollout of the DevOps development toolchain to the entire product software development is making further progress. More than 2,000 developers use the cloud-based platform in more than 200 projects every day. With highly automated integration and test methods, efficient software is created – for intelligent sensors and actuators as well as for high-performance controllers. The platform itself is also constantly being developed and scaled in agile processes to further facilitate the day-to-day work of software developers and to continuously optimize cooperation with each other and with partners. In addition to this ongoing further development, the focus in 2023 will be on the further rollout across all divisions.

In order to accelerate the development of software-based driving functions, ZF joined the Software Defined Vehicle (SDV) Working Group of the Eclipse Foundation as a strategic member in the first quarter of 2022. With a seat on the SDV Working Group SteerCo, ZF can influence the direction of important future technologies for the software-defined vehicle. In this context, ZF organized a Contribution Day Event in Friedrichshafen in June 2022. The objective of the Eclipse Foundation is to make the non-competitive activities and components of the automotive industry available and usable for all members via the SDV Working Group.

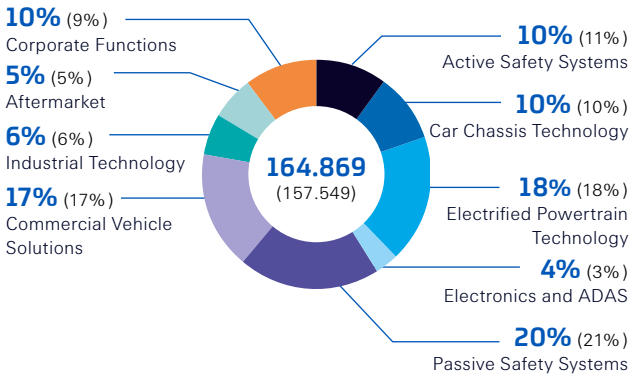
Presented in June, the cloud-based data platform OZEAN offers cross-divisional solutions to accelerate and effectively scale product digitalization. The platform offers reusable services for the learning and updating cycle, which supports the ZF vision of the software-defined vehicle. Today, our divisions use OZEAN services to collect real driving data from our products, which supports the digital transformation. Applications include fleet management, for example, ZF Bus Connect and ZF Rescue Connect services.

EMPLOYEES

> Number of employees increased by 4.6%.
> Growth mainly in research and development.

As of December 31, 2022, ZF had a global workforce of 164,869 employees (2021: 157,549). More than half of the employees (93,706) work in Europe, most of them in Germany (53,265). Staff was mainly recruited in research and development. The number of employees in Asia-Pacific and especially in the Indian Technology Center in Hyderabad increased significantly. However, the number of employees also increased in Europe and North America.

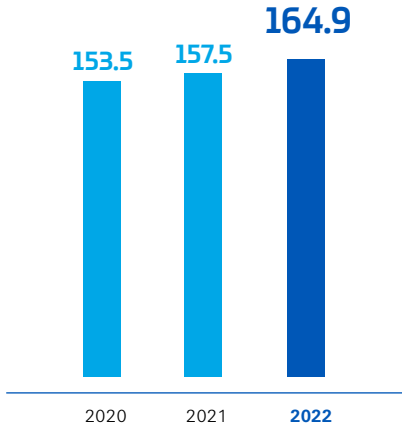
G. 08 Employees by division



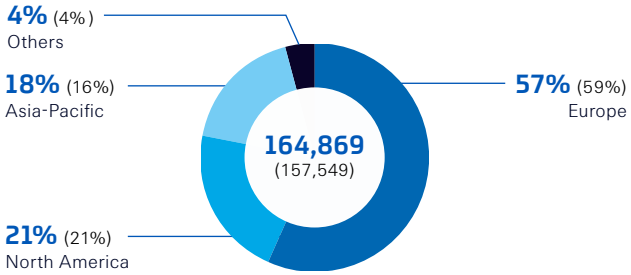
Previous year's values in brackets

G. 07 Employees

in thousand



G. 09 Employees by region



Previous year's values in brackets

For further information, refer to the Sustainability chapter.

Economic Report

MARKET AND INDUSTRY ENVIRONMENT

- **The global economy experienced a weaker development than expected at the beginning of the year.**
- **Increased risks slowed growth.**
- **Vehicle production recovered somewhat after the pandemic-related period of weakness.**

Economic recovery not as expected

The world market suffered from the negative effects of the Covid-19 pandemic in the third year as well as from raw material and semiconductor bottlenecks and the Russia-Ukraine war since February. In the wake of rising geopolitical tensions and massive inflationary pressure in recent months, the global economy did not return to momentum as originally expected. On the contrary – it entered a new weakening phase after initial recovery tendencies. While a further recovery in global economic growth of 4% was expected for 2022 at the beginning of the year, an increase of just over 3% was all that could be achieved by the end of the previous year. Practically all countries recorded growth that was lower than that of 2021.

In the second half of 2022, global economic development continued to diminish, especially in industrialized countries. A downturn in consumer spending, particularly in the United States and Western Europe, continues to put a strain on large parts of the production and service sectors. Overall economic demand was affected by the sharp rise in inflation. The partly overstretched supply chains continue to restrict the offer of the overall economy, which has been reflected in rising prices. The decline in the supply of fossil fuels caused by a reduction in deliveries from Russia is also driving inflation in Europe. China is showing the first signs of recovery following the recent coronavirus waves, although the strict restrictions in some economic centers as well as partially extensive lockdowns have slowed down the growth potential. Towards the end of the year, the tight supply chain situation had eased to a certain degree, as manifested in decreased logistics costs, among other things. Over the course of the year, developed economies experienced moderate growth: 2.0% in the United States, 3.2% in the eurozone and 1.8% in Germany, while China's growth of 3.0% was significantly below the average of recent years. All in all, the economic recovery fell significantly short of expectations following the weak previous years.

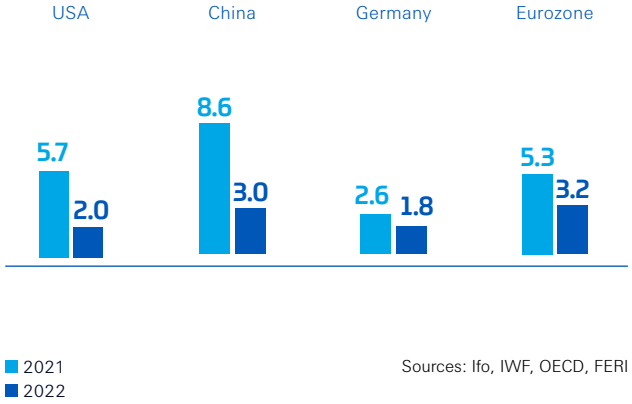
Successive crises hindering the sustained recovery of ZF markets

The aftermath of the Covid-19 pandemic, resource bottlenecks, the Russia-Ukraine war and the associated incipient energy crisis, especially in Europe, coupled with a massive increase in inflationary pressure since the middle of the year, prevented a substantial improvement in the demand and production situation of ZF's major industries.

In the past fiscal year 2022, production of passenger cars and light commercial vehicles increased by 6% to 82 million vehicles but also remained 13% below the record of almost 95 million units in 2017. Despite two years of recovery that included +3% in 2021 and +6% in 2022, the crisis years of 2019 with −6% and 2020 with −16% were still far from being offset. With

G. 10 GDP development

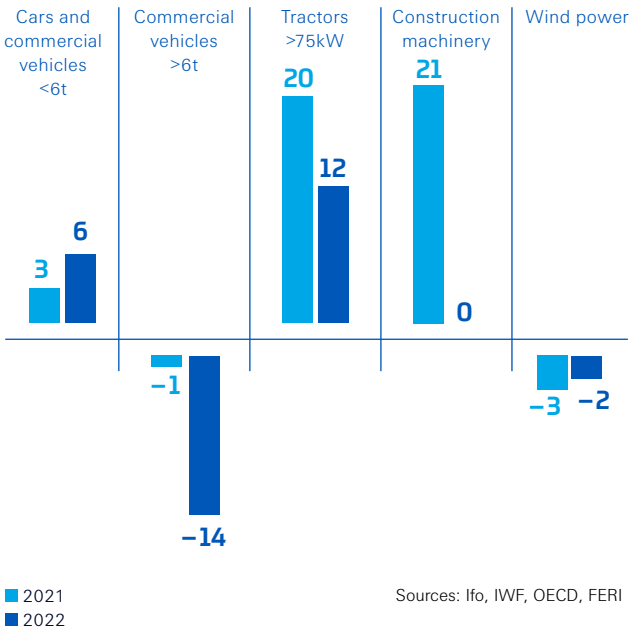
in %



Sources: Ifo, IWF, OECD, FERI

G. 11 Development of ZF's industries

in %



Sources: Ifo, IWF, OECD, FERI

the exception of Russia, which experienced a drop in vehicle production by two-thirds due to war, all major markets were able to report at least moderate gains. Europe (excluding Russia) recovered by +5%, North America by +10%, South America by +7% and China by +6%. All markets thus continued to be well below the pre-crisis levels. The primary sales market, Europe (excluding Russia), is facing a reduction of almost −30% compared to the production level achieved in 2017.

In the market for heavy commercial vehicles, the global production level recorded a sharp −14% drop due to an extraordinary effect in China. After the decline of −20% in the previous year, Chinese vehicle production had to be cut by nearly half. China was producing 1.9 million commercial vehicles in 2020, while just 810,000 were manufactured in 2022. Apart from the impact of the strict zero-Covid policy, the backdrop to these massive cuts in production included advance purchases in 2020 and 2021 due to stricter emission regulations. The markets in Europe and North America experienced stable positive development with growth rates of +12% and +10%, respectively. After a quite significant increase of nearly 60% in 2021, South America was again able to increase production by 10%. India performed very well: After an increase of 80% in the previous year, production was again expanded by nearly 30% in 2022.

The industrial sectors were characterized by a variety of different developments in 2022. The agricultural machinery industry saw a 12% increase in production worldwide. China supported the positive trend with growth of more than 30%, North America reached +8% and South America +10%, while Europe experienced a stable development at the level of the previous year. In the construction machinery industry, the global volume remained the same as in the previous year. The decline in China of −15% was offset by growth in Europe of +5%, North America of +8% and South America of +25%. The global market for wind turbines exhibited a slight decline. While Europe recorded weaker trends with −3%, China achieved a strong growth of +16%. By contrast, the North American market experienced a significant downward correction with a reduction of nearly 40% after the corresponding subsidy programs expired.

OVERALL DEVELOPMENT OF THE GROUP

- **In a challenging environment, the focus was on safeguarding the income situation.**
- **Sales experienced stronger growth than the overall market.**
- **Increased procurement costs and costs for production start-up influenced the results and increased inventories the cash flow.**
- **ZF remains on a solid financial foundation.**

Overview of the business trend and Board of Management overall statement on business performance

The year 2022 was once again marked by challenges. The Covid-19 pandemic, the semiconductor shortage and disrupted supply chains have been weighing on us for three years now. Special measures such as the comprehensive lockdowns in China in spring also had an impact on the global economy. Furthermore, as a result of the Russia-Ukraine war, international sanctions were imposed on Russia, which had significant political, social and economic implications that also affected ZF's business activities.

After all, we are experiencing an inflation, which at times was in a double-digit percentage range, not least due to scarcity of materials and high prices for energy and precursors. This is a new situation for our business relations with customers and suppliers. We therefore remain in constant dialogue with all partners in the supply chain in order to find good solutions even in times of difficulty.

As of January 1, 2022, the Commercial Vehicle Control Systems Division was merged with the Commercial Vehicle Technology Division to form the new

Commercial Vehicle Solutions Division. ZF has thus positioned itself as a global systems supplier in the commercial vehicle market.

In the past fiscal year, the ZF Group achieved the sales forecast from the beginning of the year of more than €40 billion in a market environment that remained difficult for the automotive supplier industry. In total, sales increased by around 14% from €38.3 billion to €43.8 billion. Adjusted for exchange rate effects, sales increased by approx. 9%, which exceeds market growth.

The adjusted EBIT margin of 4.7% (2021: 5.0%) is within the forecast range of between 4.5% and 5.5%. The adjusted EBIT of €2.0 billion (2021: €1.9 billion) is primarily influenced by the increased procurement costs as well as costs associated with production start-up due to capacities expanded especially for electric mobility. In this challenging year, ZF still consistently pursued the Next Generation Mobility strategy and increased research and development costs to approx. €2.8 billion. These advance investments for the transformation towards electrification, software-defined vehicles and autonomous mobility also had an impact on the result in 2022.

The adjusted free cash flow amounted to roughly €0.5 billion, putting it outside the forecast range between €1.0 billion and €1.5 billion. The high current assets due to inflationary effects and required safety stocks were the reason for this.

Against the backdrop of increased costs for energy and precursors, the focus was placed on safeguarding the income situation. Furthermore, ZF invested in pioneering technologies in a targeted manner and at a rate greater than average. This was especially true in terms of the further digitalization and the development of software expertise. These are the most important prerequisites for ZF as a company and its products to be fit for the future of mobility and to be able to keep up with the modern business environment.

The focus was also placed on actively shaping the maturity profile of the financial liabilities of the ZF Group. The company increased its existing revolving credit facility (RCF) from €3.0 billion to €3.5 billion, thus securing attractive and long-term, predictable financing conditions one year before maturity. By simultaneously expanding the group of core banks, ZF is underscoring its strong position on the capital market. ZF also successfully issued a bonded loan in the amount of €700 million. The bonded loan is linked to an EcoVadis sustainability rating for the first time.

The increase in equity based on the net profit after tax as well as positive valuation effects, which had reduced equity in recent years, led to an increase in the equity ratio by about three percentage points to 22% at the end of the fiscal year.

The ZF Group rests on a solid financial foundation thanks to its long-term oriented and diversified financing, as well as cash and cash equivalents of more than €2.5 billion and an unused credit line at Group level of €3.5 billion.

Against the backdrop of a stable liquidity and financing basis as well as a positive business performance, the Board of Management is confident with regard to the future economic situation of the ZF Group.

RESULTS OF OPERATIONS, NET ASSETS AND FINANCIAL POSITION

Results of operations

> **Despite difficult market conditions, Group sales were up 14%.**
> **The adjusted EBIT margin suffered from increased procurement costs and new product launches.**

Group sales development

Despite the war in Ukraine, the pandemic-related lockdowns in China and continued bottlenecks in the semiconductor market, the Group sales trended upward in 2022. In fiscal year 2022, the ZF Group achieved sales of €43,801 million (2021: €38,313 million), which corresponds to an increase in sales of roughly €5.5 billion over the previous year. Adjusted for positive exchange rate effects, sales grew by approx. 9%. This figure also includes inflation-related price effects as well as retrospective price adjustments.

Sales development in the divisions

The differences in the development of the divisions can be traced back to the regional presence and customer base of each division. However, it is also apparent that the transformation in the automotive industry has influenced growth – especially in the area of electric mobility and automated driving.

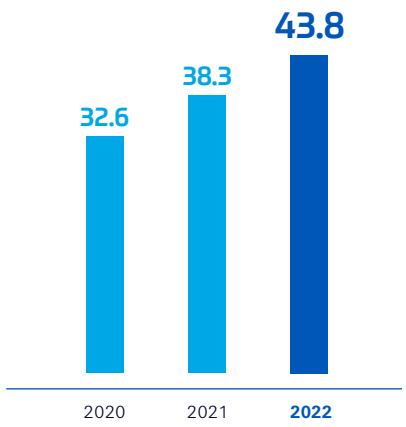
As the market continued to recover, the Active Safety Systems Division experienced an increase in sales of approx. 22% to €6,479 million (2021: €5,298 million). With a strong presence in North America, the division is more strongly affected by the strong US dollar. Adjusted for exchange rate effects, growth was about 14% over the previous year.

T. 02 Statement of profit or loss

in € million	2022	%	2021	%
Sales	43,801	100%	38,313	100%
Cost of sales	−36,904	−84.3%	−31,779	−82.9%
Gross profit on sales	**6,897**	**15.7%**	**6,534**	**17.1%**
Research and development costs	−2,790	−6.4%	−2,596	−6.8%
Selling and administrative expenses	−3,115	−7.1%	−2,936	−7.7%
Other income and expenses	132	0.3%	194	0.5%
Net result from participations	−15	0.0%	225	0.6%
EBIT	**1,109**	**2.5%**	**1,421**	**3.7%**
Net financial result	−547	−1.2%	−339	−0.9%
Net profit or loss before tax	**562**	**1.3%**	**1,082**	**2.8%**
Income taxes	−186	−33.1%	−299	−27.6%
Net profit or loss after tax	**376**	**0.9%**	**783**	**2.0%**

G. 12 Sales development

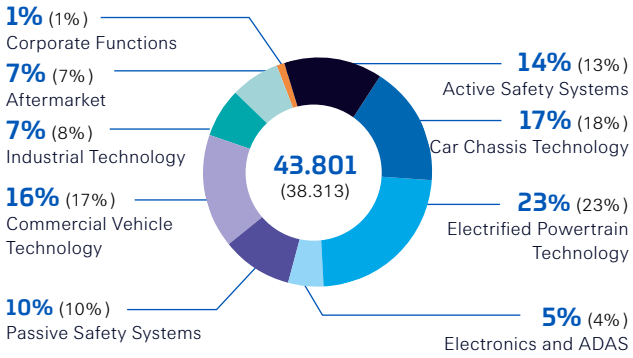
in € billion



Sales in the Car Chassis Technology Division amounted to €8,100 million (2021: €7,294 million). This corresponds to a sales increase of roughly 11% compared to the previous year. Within the division, the Chassis Components, Chassis Systems and Suspension Technology business units were the primary sales drivers.

The Electrified Powertrain Technology Division generated sales of €10.839 million (2021: €9,553 million). The sales increase amounted to approx. 14%, significantly exceeding the overall market, which grew by around 6%. Here, we were able to continue to benefit from the strong growth of electric mobility with battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs).

G. 13 Sales by division



Previous year's values in brackets / Total sales in € million

With sales of €2,433 million (2021: €1,835 million), the Electronics and ADAS Division achieved sales growth of around 33%. Adjusted for exchange rate effects, growth was roughly 24%. This was due to improvements in all product segments and a stronger contribution from ADAS based on new product launches.

The Passive Safety Systems Division achieved sales of €4,541 million (2021: €3,804 million), which corresponds to an increase of approx. 19%. In addition to exchange rate gains of 8% due to the global positioning of the division, organic sales growth was 11%. It was the seat belt systems and inflatable restraint systems in particular that contributed to the overall positive sales development.

On January 1, 2022, the former WABCO business and ZF Commercial Vehicle Technology were merged into the Commercial Vehicle Solutions Division. Sales of the new Commercial Vehicle Solutions Division amounted to €7,513 million (adjusted 2021: €6,888 million).

T. 03 Sales development by division

in € million	2022	2021	Change
Active Safety Systems	6,479	5,298	1,181
Car Chassis Technology	8,100	7,294	806
Electrified Powertrain Technology	10,839	9,553	1,286
Electronics and ADAS	2,433	1,835	598
Passive Safety Systems	4,541	3,804	737
Commercial Vehicle Solutions	7,513	6,888 [1]	625
Industrial Technology	3,427	3,164	263
Aftermarket	3,178	3,007	171
Corporate Functions	397	325	72
Consolidation	–3,106	–2,855 [1]	–251
Total	**43,801**	**38,313**	**5,488**

1) 2021 adjusted

T. 04 Sales development by region

in € million	2022	2021	Change
Europe	18,717	17,297	1,420
North America	12,487	10,194	2,293
Asia-Pacific	10,689	9,395	1,294
South America	1,432	1,054	378
Africa	476	373	103
Total	**43,801**	**38,313**	**5,488**

This corresponds to an increase in sales of roughly 9%. Adjusted for exchange rate effects, organic sales growth amounted to around 6%. With a simultaneous decline in the overall market of approx. 14% in the commercial vehicle business, it means that the division significantly outperformed the market.

In fiscal year 2022, sales of the Industrial Technology Division amounted to €3,427 million, which corresponds to an increase of approx. 8% (2021: €3,164 million). The Off-Highway & Test Systems Business Unit made a significant contribution to this growth.

In the past fiscal year 2022, sales of the Aftermarket Division also increased by around 6% to €3,178 million (2021: €3,007 million).

Regional sales distribution

In the overall year, sales in Europe amounted to €18,717 million (2021: €17,297 million), roughly 8% above the figure of the previous year. Sales in North America amounted to €12.487 million in the fiscal year (2021: €10.194 million), which corresponds to an increase of around 22%. Sales in the Asia-Pacific region were €10,689 million above the previous-year figure of €9,395 million. Sales increases were also recorded in the regions of South America and Africa. At the end of the year, sales amounted to €1,432 million in South America and €476 million in Africa.

The distribution of sales by region revealed the following: Europe remained the strongest-selling region at roughly 43% (2021: roughly 45%). Due to the strong exchange rate, North America's sales share increased from approx. 27% to approx. 29%. The share of sales in the Asia-Pacific region remained unchanged at around 24%. The Region of South America has a sales share of roughly 3%, and the Region of Africa roughly 1%.

Gross margin at 15.7%

Gross profit on sales amounted to €6,897 million (2021: €6,534 million), which is equivalent to a gross margin of 15.7% (2021: 17.1%). The absolute increase is mainly attributable to higher sales. On the other hand, the sharp rise in procurement costs and costs associated with production start-up resulting from the expansion of capacity, especially for electric mobility, severely impacted gross profit. Research and development costs amounted to €2,790 million (2021: €2,596 million), representing 6.4% of sales after 6.8% in the previous year. The focus was on consistent implementation of the corporate strategy in terms of strengthening the defined future technologies of electrification, software-defined vehicles and autonomous mobility against the backdrop of transformation in the automotive industry.

Compared to the previous year, sales and administrative expenses increased slightly from €2,936 million to €3,115 million.

Adjusted EBIT margin of 4.7%

EBIT totaled €1,109 million in the past fiscal year (2021: €1,421 million). Adjusted for the expenses for the purchase price allocation for company acquisitions in the amount of €730 million, restructuring expenses in the amount of €83 million as well as the negative balance from M&A activities and one-off effects in the amount of €116 million, the adjusted EBIT margin amounts to 4.7% (2021: 5.0%). The reason for this was the significantly lower gross margin. In the year under review, one-off effects mainly affected expenses related to the deconsolidation of Russian subsidiaries and the depreciation of assets as a result of sanctions against Russia as well as special expenses related to the lockdown in China in spring 2022. At 4.7%, we were nevertheless within the forecast range of 4.5% to 5.5%. Adjusted EBIT is defined as EBIT corrected for net effects from the purchase price allocation, including amortization and depreciation, as well as M&A activities and other special items that are considered exceptional or non-recurring in nature.

In the past fiscal year, the net financial result amounted to –€547 million after totaling –€339 million in 2021. The main reasons for the deterioration were the drawdown of financial guarantees for participations and lower interest income.

Income tax expenses amounted to €186 million in fiscal year 2022 (2021: €299 million). The income tax rate is 33.1%.

Net assets and financial position

- **Higher material costs and actions to protect supply chains increased the assets.**
- **Investments are slightly above the previous year's level.**
- **There was further expansion of sustainable financing, and ESG-linked bonds were issued in the amount of €700 million.**

Increase in total assets

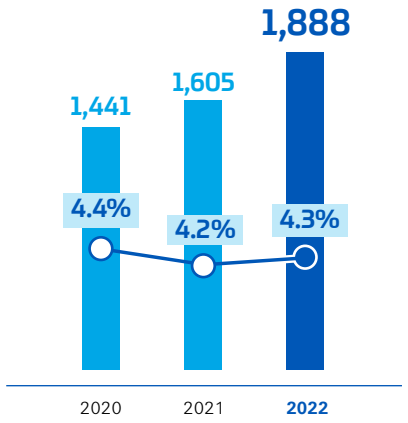
Compared to the prior year, total assets increased by €585 million to €38,944 million (2021: €38,359 million).

Current assets, including assets held for sale, increased by €1,457 million to €15,711 million (2021: €14,254 million), mainly due to the increase in inventories and trade receivables. The increase in inventories by €604 million to €5,597 million (2021: €4,993 million) is mainly due to increased material costs and the safety stocks maintained for securing the supply chain.

Non-current assets amounted to €23,233 million (2021: €24,105 million). Intangible assets, as a result of amortization, and deferred tax assets in particular have declined.

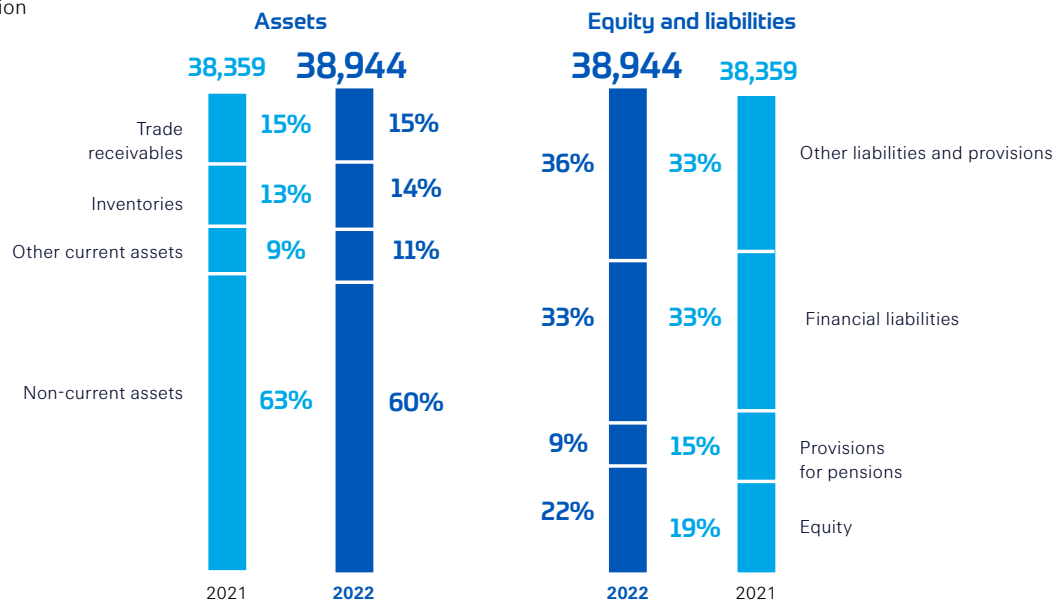
G. 15 Investments and investment ratio

in € million / share of Group sales in %



G. 14 Consolidated statement of financial position

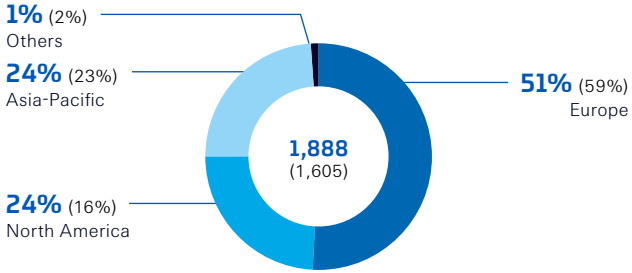
in € million



Investments of €1.9 billion

In the past fiscal year, investments in property, plant and equipment amounted to €1,888 million (2021: €1,605 million). The investment ratio is therefore 4.3% of sales and slightly above the previous year's level of 4.2%.

G. 16 Investments by region



Previous year's values in brackets / Total investment in € million

Of the capital expenditure, 52.1% was spent on payments in advance and construction in progress, 27.4% on technical equipment and machines, 11.4% on land and buildings and 9.1% on other equipment, factory and office equipment.

In geographical terms, capital expenditure focused on Europe (51%), followed by North America (24%) and Asia-Pacific (24%).

Investments were made in the new technology fields of electric mobility and autonomous driving as well as established fields such as transmission applications (including hybridization), chassis systems, electronics, damper modules, brakes, steering systems and other safety technology.

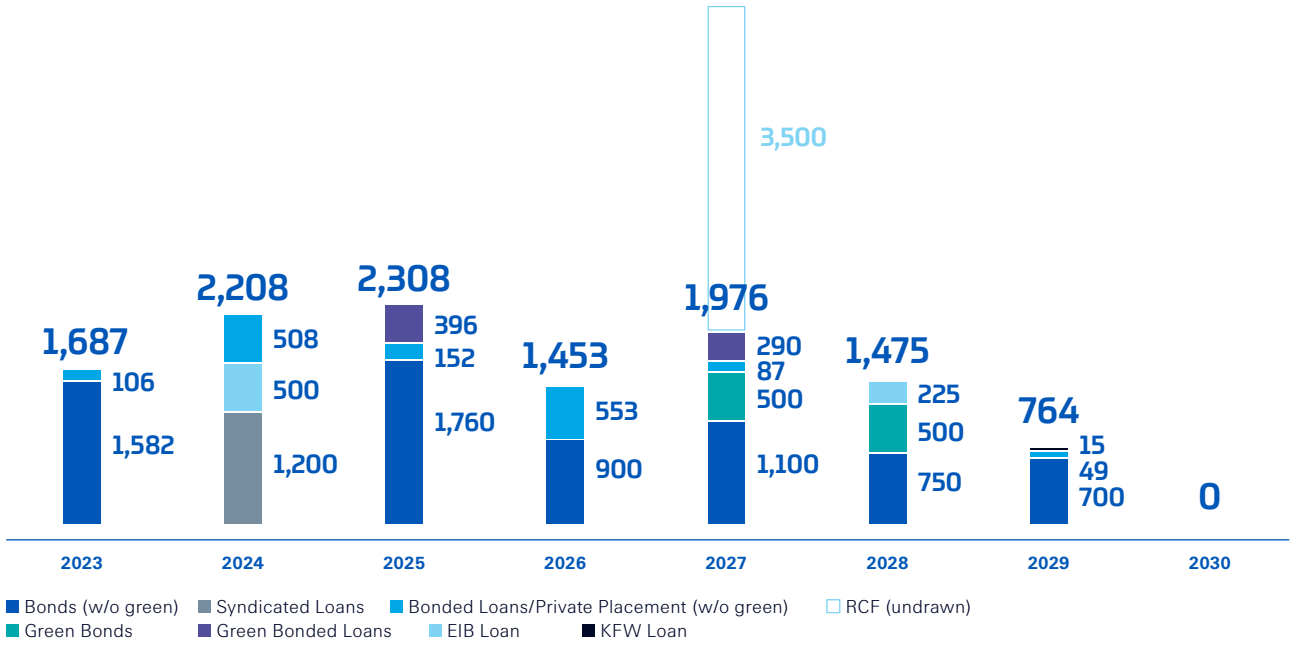
Sustainable financing further expanded

Current and non-current financial liabilities amounted to a total of €13,036 million as of December 31, 2022 (2021: €12,591 million). Without considering the change of derivative financial instruments, there was an increase in gross debt year-on-year of approx. €423 million.

The financial liabilities assumed as part of the inclusion of WABCO at the acquisition date were further reduced in the reporting period.

To finance the WABCO purchase price, bonded loans with a total nominal volume of €2.1 billion were taken up in 2019 and 2020. The tranches have both fixed and variable interest rates with maturity periods of

G. 17 Maturity profile
in € million



three, five, seven and ten years from disbursement. After early repayment of a variable interest tranche of €410 million in 2021, the three-year fixed interest tranche of €240 million was repaid as planned in October 2022. In addition, a credit limit at ZF's core banks totaling €2.5 billion was used for the company acquisition. The variable interest-bearing loan included two tranches of €1.0 billion (maturity period until 2022) and €1.5 billion (maturity period until 2024). The tranche due in 2022 was fully repaid already in 2021.

Furthermore, the tranche due in 2024 was reduced by €300 million. To finance the purchase price for WABCO, Euro bonds with a total volume of €2.7 billion were issued already in fiscal year 2019. The bonds have maturities between 2023 and 2029 and have fixed interest rates.

ZF was the first automotive supplier in Germany to issue a green bond under the Debt Issuance Program (DIP), doing so for the first time in April 2021. It is based on ZF's Green Finance Framework. The fixed-interest green bond has a nominal volume of €500 million and a maturity period of six years. The proceeds are used for the development, production and sale of products for BEVs (clean transportation) and for the development, production and sale of gearboxes for wind turbines (renewable energy). In November 2021, another transaction followed with a fixed-rate individual tranche of €500 million and a maturity period of six and a half years. In April 2022, ZF published a ZF Green Finance Report for the first time, which included the use of funds and the avoided emissions in impact reporting.

To increase the flexibility of borrowing funds on the capital market, ZF launched the DIP in September 2020. Potential issuers are ZF Friedrichshafen AG and its 100% subsidiary ZF Finance GmbH. The DIP has a potential total volume of €7.5 billion. In September 2020, ZF completed an issuance under the DIP for the first time. The bonds issued are divided into two fixed-interest tranches with a volume of €750 million each and have maturity periods of five and eight years. In November 2020, another transaction followed with a fixed-rate individual tranche of €500 million and a maturity period of six and a half years. The bonds were issued by ZF Finance GmbH under the guarantee of ZF Friedrichshafen AG.

In October 2022, ZF issued ESG-linked bonded loans with a nominal volume of €700 million in total. The tranches have both fixed and variable interest rates with maturity periods of three, five and seven years from disbursement. The variable tranches were hedged against rising interest rates in November 2022.

In addition, a variable interest-bearing loan in the amount of €500 million was taken out at the European Investment Bank. The loan must be repaid in 2024 at the latest. In December 2021, another variable-interest loan was concluded with the European Investment Bank in the amount of €250 million, of which €225 million was drawn upon as of the reporting date.

The remaining financial liabilities primarily result from financing the acquisition of TRW in 2015. The seven-year bonded loan of €345 million was repaid in January 2022. The remaining financial instruments in this context are euro and US dollar bonds with maturities from 2023 to 2025 and a nominal volume of €1,075 million for euro bonds and $1,077 million for US dollar bonds outstanding as of the reporting date (2021: €1,075 million and $1,077 million). The bonds have fixed interest rates.

The syndicated loan that was refinanced in 2022 and had a remaining amount of €3.5 billion in the form of a revolving credit facility was unused as of the reporting date. The credit line was refinanced in the year under review with an increase in volume from €3.0 billion to €3.5 billion and has a remaining term that expires in July 2027. As part of the refinancing, the syndicated loan was provided with an ESG component.

Against the backdrop of the corporate goal of achieving financial independence, ZF aspires to be assigned a stable investment grade rating. As of the reporting date, ZF had company and bond ratings of Ba1 with a stable outlook from Moody's and BB+ from Standard and Poor's, also with a stable outlook. Both rating agencies gave ZF a stable outlook in 2022.

As of the reporting date, trade payables amounted to €7,024 million (2021: €5,885 million). This increase is mainly due to higher business volumes and the inflation. Provisions for pensions amounted to €3,551 million as of December 31, 2022 (2021: €5,680 million). The significant decline mainly resulted from the adjustment of the discount rate to be applied for the valuation of pensions in Germany to 3.7% (2021: 1.2%).

As of the reporting date, the Group equity including non-controlling interests amounted to €8,595 million (2021: €7,123 million). The increase mainly resulted from actuarial gains due to the adjustment of the discount rates to be applied for the valuation of pensions. Moreover, the positive result after tax and currency translation had an equity-enhancing effect.

In the reporting period, a dividend of €119 million was paid to the shareholders of ZF Friedrichshafen AG. Due to the described development of equity in combination with the increase in total assets, the equity ratio increased to 22.1% (2021: 18.6%).

Adjusted free cash flow at €544 million

Taking into account the effects of exchange rate changes at the end of the year, the cash position of the year under review is €2,530 million (2021: €2,332 million).

The cash flow from operating activities decreased to €2,189 million (2021: €2,419 million). The decline mainly results from the lower net profit before income tax, a sales-driven increase in trade receivables as well as an increase in contract assets compared to the previous year. Trade liabilities in particular had an adverse effect due to increased raw material prices.

T. 05 Consolidated statement of cash flows

in € million	2022	2021
Cash flow from operating activities	2,189	2,419
Cash flow from investing activities	–1,612	–1,005
Free cash flow	**577**	**1,414**
Cash flow from financing activities	–391	–1,539
Net change in cash	**186**	**–125**
Cash position at the beginning of the fiscal year	2,332	2,341
Other changes in cash and cash equivalents	12	116
Cash position at the end of the fiscal year	**2,530**	**2,332**

The cash flow from investing activities amounted to –€1,612 million (2021: –€1,005 million). The decline is mainly due to higher investments and lower deposits from M&A activities.

As a result, the free cash flow amounts to €577 million compared to €1,414 million in the previous year. The free cash flow, adjusted for cash inflows and outflows in connection with M&A activities, amounts to €544 million (2021: €991 million) and is not within the range forecast at the beginning of the year of €1.0 billion to €1.5 billion. The high current assets due to inflationary effects and required collateral stocks are the reasons for this.

The cash flow from financing activities amounted to –€391 million in the expired fiscal year (2021: –€1,539 million). The balance from repayments and new borrowings of financial debt amounted to €162 million (2021: –€1,128 million).

The net financial position increased by €271 million and amounted to –€10,378 million (2021: –€10,107 million) as of the reporting date. It consists of current and non-current financial liabilities excluding derivative financial instruments, less cash and cash equivalents as well as securities recorded as financial assets.

Opportunities and Risks

- **Risks are managed within the framework of our decentralized Enterprise Risk Management (ERM) system where they arise.**
- **Sustainability is of strategic importance to ZF. Here, we are confronted with more stringent requirements, in particular emission and reporting regulations.**
- **Rising geopolitical tensions between individual countries and regions may also lead to pressure in 2023.**
- **Our strategy of clean, safe, comfortable and affordable mobility as well as progressing digitalization open up new sales opportunities for us.**
- **We do not see any risks that jeopardize the company's continued existence, either alone or in combination with other risks.**

ORGANIZATION OF THE OPPORTUNITY AND RISK MANAGEMENT SYSTEM

ZF defines risks as any internally and externally occurring event or development that may result in a negative deviation from the business plan, whereas opportunities may result in a positive target deviation.

Through established processes and responsibilities, our risk management system involves all pillars of the ZF Group matrix organization, consisting of corporate functions, divisions and regions. The objective is to identify and analyze risks and opportunities early on and to take measures to manage risks and seize the opportunities associated with them.

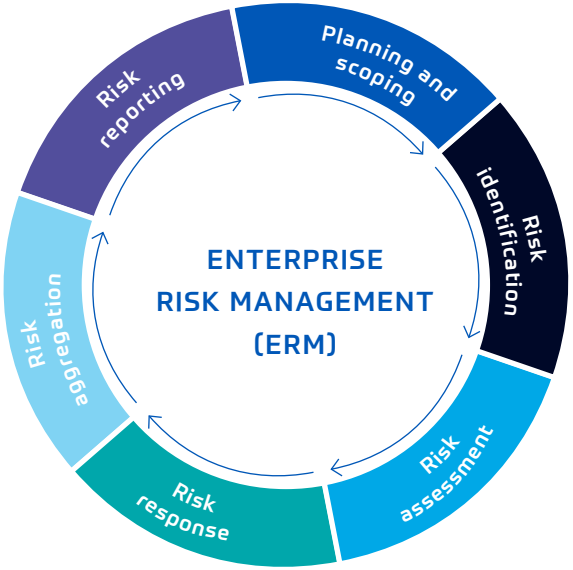
Group Risk Management coordinates the ERM process at Group level and provides the structures, methods and processes for its implementation as a governance and assurance function. There is an ERM Directive in place which addresses all employees.

The Board of Management bears overall responsibility for the risk management system. At least every three months, it informs the Audit Committee and the Supervisory Board comprehensively about the opportunities and risks of the ZF Group and the respective control measures initiated and planned. The Group risk report is part of the integrated governance, risk and compliance (GRC) report, which is presented to the Board of Management and the Audit Committee.

At Group level, the cross-functional Risk Committee, chaired by the Chief Financial Officer, is tasked with evaluating ZF's risk situation – regularly or ad hoc if necessary – and ensuring its proactive management. The continuous further development of corporate governance aspects within the framework of the GRC approach is another essential task of the Risk Committee.

G. 18 Risk management at ZF

G. 19 Enterprise Risk Management (ERM)



Within the scope of its control obligation, the Supervisory Board deals at least every six months with the effectiveness of the risk management system. Among other things, Corporate Audit is responsible for regularly checking and evaluating the efficiency of the risk management system, including the implementation of the underlying ERM Directive. Within the context of the annual or consolidated financial statements audit, the auditor appointed by the Supervisory Board also assesses whether the Board of Management has set up suitable measures for the establishment of a monitoring system in order to detect early on whether there is any development that may threaten the existence of the company. Insights from these regular audits are integrated into the continuous further development of the ERM.

At least every three months and ad hoc, if required, the operational and strategic risks within the matrix organization are identified, assessed and reported. The Group-wide ZF risk catalog, which is subject to an annual review by the GRC community, supports risk identification.

Risks are chiefly assessed using quantitative criteria, differentiated according to their gross risk value (before risk treatment) and net risk value (after risk treatment), and the indication of a probability of occurrence range (%). The possibility of qualitative risk assessment using our GRC consequence matrix enables us to also consider and manage not (yet) quantifiable or difficult-to-quantify risks in our risk landscape. Significant risks for the Group are identified for Group reporting by means of thresholds defined by the Board of Management with regard to potential extent of damage and probability of occurrence. We include opportunities if they have a direct material link to a risk.

To manage a risk, the responsible risk managers or risk owners define measures which are also documented and tracked in the Group's reporting. Interdependencies between individual risks and aggregation effects are taken into account. An aggregation of the overall risk landscape ensures that ZF's risk position does not exceed its risk-bearing capacity.

The aforementioned activities ensure that risks and opportunities are continuously analyzed throughout the Group. In this way, we want to increase risk awareness inside our organization and establish the framework for further developing our corporate risk culture that is embedded in our risk strategy.

KEY RISKS COMMENTARY

Based on our current assessment, the risks classed as significant to the future development of the company are described below. Risk reporting generally covers a whole year. Risks that are subject to regular reporting essentially arise in the areas of quality, procurement, finance and cybersecurity. Risks that arise out of transactions relevant under taxation law and other legislation are also reported.

Industry environment risks

As a global player we face location-, country- and region-specific risks arising, among other things, from overall economic and geopolitical changes as well as epidemiological and pandemic developments.

The conflict between Russia and Ukraine intensified massively at the beginning of the fiscal year 2022 with the outbreak of the war. Since March 2022, all business activities with Belarus, Russia and the Ukrainian regions of Donetsk, Luhansk, Crimea and Sevastopol have been suspended until further notice. Due to the war in Ukraine, we continue to expect significant political, social and economic impacts on our business activities, such as high energy and raw material prices as well as potential supply chain disruptions. Group-

wide and cross-divisional working groups monitor the situation and derive appropriate measures in order to continue to ensure the protection of our employees and the security of our IT systems, as well as to ensure compliant business activities and compliance with international sanctions.

In this context, the focus is also on the energy security of our plants. In order to adequately take account of the uncertainty of possible gas supply cuts on the part of Russia, Group-wide and local, plant-level teams closely monitored developments in 2022. Preventive and reactive measures were derived and implemented along the value chain. This is to reduce the risk of production interruptions at ZF locations in Europe, especially in Germany, also for the upcoming winter of 2023/2024.

Rising geopolitical tensions and violent conflicts between individual countries and regions may lead to further strains for the ZF Group. In particular, seeing the potential economic and security conflicts between the USA and China as well as the potential deterioration of the situation in East Asia, we use scenarios as a basis to develop measures for robust supply chains and the avoidance of critical dependencies. We are also seeing continued protectionist trends in individual countries trying to protect and/or improve their competitiveness on the global markets, such as the expansion of firm market access barriers. The increasing number of competitors, in particular from Asia, may have a strong effect on our sales prices, especially in our key sales markets in Europe, the USA, China and India.

In addition to activities in the traditional markets, we want to continue to proactively position ourselves in growth markets and previously underrepresented markets. Changing political conditions, structural deficits and economic downturns in some countries may lead to declining sales and payment defaults. ZF counteracts market slowdowns in individual regions by volume shifts to other markets. Our global presence, the expansion of our product portfolio in the area of electric and automated or autonomous driving as well as the organically and inorganically strengthened power of innovation enable us to limit market risks for ZF.

In the macroeconomic environment, we see clear signs of a global economic slowdown. There is still the risk of a recession in Europe and Germany, although the economic outlook improved in the first months of 2023. The low-interest rate environment and the expansive monetary policy of the previous years are replaced by rising interest rates and a more cautious monetary policy worldwide, combined with high inflation rates. We expect immediate consequences for our business performance. Furthermore, the already visible impacts of climate change present new, uncertain challenges for economies.

Sales risks

Demand for our products and services is affected by macroeconomic developments, such as inflation and interest rates, geopolitical events, legislation and end customer behavior, which may lead to unexpected market reactions in the short and medium term. Worldwide production is thus still subject to high volatility. Furthermore, there are risks on the procurement side with respect to purchased parts and transport logistics. This makes it more difficult for us to predict our sales volumes and there is a risk that our production facilities are underutilized. Our logistics early-warning system and requirements-oriented production planning enable us to respond flexibly to fluctuations in demand. Also, mergers of OEMs can lead to increased margin pressure due to transparency regarding prices and costs as well as the bundling of purchasing volumes. Through market research activities and our continuous monitoring of sales markets, we strive to identify changes in market structures and customer behavior at an early stage and thereby proactively combat the associated sales risks.

Risks may ensue also from the ramp-up of new products and the breakthrough of disruptive technologies. As a supplier, we are facing high investment requirements and intensive price pressure from our customers, but also limited internal resources. Our portfolio management approach enables the divisions to strategically manage their product portfolios and distribute resources in the best possible way.

In the area of mobility, stricter regulations on exhaust gas and consumption values of vehicles in the EU and Asia lead to changes in consumer behavior. We expect the share of hybrid and battery electric vehicles to continue to increase, which will have a negative impact on the sales of combustion vehicles and their components. As announced in 2020, ZF no longer develops driveline components for pure combustion engine vehicles.

Moreover, by means of structural changes, ZF continues to adapt capacities worldwide to adjust to weaker demand and to anticipate the rapid transformation to electric mobility. Through a network of partnerships and alliances, we continue to adapt our product range to market conditions and expand our activities in pioneering fields.

Quality risks

We take responsibility for our products and thus for their impact on society, our business partners and the environment. Non-compliant internal or external components or functions can lead to time and cost-intensive corrective measures as well as recalls, associated reputation damage and customer churn. This is especially true in light of the fact that many of our products are important components that contribute to the overall safety, durability and performance of our customers' final products. For products that do not comply with customer specifications or (supposedly) exhibit malfunctions, ZF may incur significant costs due to warranty and product liability claims.

ZF established a certified quality management system according to IATF 16949 with standardized and consistent quality controls as well as regularly optimized process workflows in order to maintain our product quality at the highest level despite the increasing product complexity and connectivity. The close cooperation between our Product Safety and Regulatory Office, Quality Assurance of the divisions and Corporate Research and Development is to ensure that quality problems are identified as early as possible and the associated risks can be promptly addressed and mitigated. With our comprehensive Product Compliance Management System we want to ensure that products entering the market meet all technical, legal and contractual requirements in all regions.

Procurement risks

According to ZF's purchasing strategy, raw materials are to be procured from a variety of different suppliers in different regions. Nonetheless, we cannot always avoid being dependent on individual suppliers and consequently on their financial stability. Delays in delivery and cancellations (e.g., due to force majeure, capacity bottlenecks with forwarding agents, financial problems and even insolvency of subcontractors) as well as the consequences of strikes or insufficient quality can lead to negative effects on our production. This could in turn cause delays in deliveries to our customers.

On the procurement side, 2022 was characterized by the continued fight against the pandemic, the shortage of semiconductors and other electronic components, as well as sharply rising prices for raw materials, freight, logistics and energy. Indeed, we expect that the peak of inflation for raw materials and other relevant purchasing groups (e.g., electronic components, freight or indirect production material) has been reached, but there will be no tangible decrease before 2024. ZF responds to these challenges by continuously tracking the procurement situation, staying in close contact with customers and suppliers, and adapting the supply chains. Energy and semiconductor procurement are monitored by specialized task forces due to the tense supply situation. A suitable bottleneck control system is intended to minimize or ideally prevent negative impacts. Increasing costs for products and components, including additional or higher customs duties, must be compensated for by improving productivity, establishing synergies or distribution to the upstream and downstream supply chains. If this does not succeed, demand for ZF products may decline for price reasons and profitability may be reduced.

Our Supplier Risk Management systematically works to avoid interruptions in deliveries due to financial instability or market introduction, quality and logistics problems at suppliers and to reduce our procurement risk position to a minimum by identifying supply alternatives. Moreover, continuous market investigation and a regular review of key suppliers enable us to respond adequately and early to unfavorable developments on the raw materials and energy markets. The expected commercial risks were evaluated with regard to customer, market and legal aspects, taking into account the required assumptions, and were recognized accordingly in the planning.

Research and development risks

Our business with OEM customers in the automotive industry in particular is subject to market developments and technical trends to which we must respond with innovations in good time. This entails operational and strategic development and technology risks.

Risks and opportunities also arise from the increasing awareness of sustainability and environmental aspects in the markets as well as from new and stricter regulations on the reduction of emissions. We are currently

achieving a significant share of our sales with products based on the combustion engine driveline. The extensive discussions about an end date for the combustion engine as well as driving bans that have been announced locally, regionally and nationally, or have already been imposed, are major factors of uncertainty for the entire automotive industry, especially in Europe. The resulting advancing electrification in the field of passenger car and commercial vehicle drives as well as other technological changes could jeopardize our market position if we are not successful in expanding our expertise accordingly.

Moreover, we are seeing an increasing demand for active driver assistance functions up to and including automated driving and the associated future mobility concepts. Due to the transition from hardware to software-defined technologies, electronic architectures are currently subject to a significant change.

Both product development and product optimization processes generally involve a number of risks. These include possible delays due to increasingly interconnected supply chains and cost overruns, especially in long-term development projects. Furthermore, risks arise from possible intellectual property violations as well as (cyber) risks within the context of networked products and the increased use of the artificial intelligence of things (AIoT) and cloud solutions.

In order to address development and technology risks, we rely on a modular design concept, the establishment of strategic partnerships and the acquisition of company participations in the area of future technologies. At the same time, we are operating cross-divisionally via agile Competence Centers, Tech Centers and System Houses. This allows us to provide both external and internal customers with system solutions for any application according to their needs and market requirements. Despite the currently tense economic environment, we are keeping research and development expenditure at a high level.

Cyber and information technology risks

Our comprehensive cybersecurity strategy aims at protecting people, business and personal information and data as well as our physical and intangible assets in cyberspace. The progressing digitalization of our processes and products as well as the increasing interconnection of machines, products, systems, services and partners lead to risks in the area of information processing and technology. Our integrated Information Security Management System (ISMS) based on ISO 27001 covers not only IT but also development, production, staff security, compliance, physical safety as well as legal and customer requirements. The ISMS is regularly checked by independent authorities.

Through technical and organizational measures, we protect data streams and processing in our production, development and IT infrastructures, both on-premise (on-site operation) and off-premise (e.g., in the cloud). Alongside these measures, ZF's security culture plays a key role in the company's resilience. Consequently, we perform regular, mandatory awareness-raising measures with our workforce worldwide, such as our Security Awareness Weeks and information security training. Partners and suppliers handling ZF information are committed to comply with our security policy and to provide proof of an effective ISMS. We use internal and external sources of information to monitor the global cybersecurity situation. Alarm and emergency systems are in place for security incidents, enabling us to react immediately with corresponding contingency plans and clearly identified crisis response teams. The functioning of these processes is checked regularly. A cross-divisional and Group-wide Cybersecurity Advisory and Decision Panel monitors and manages ZF's cyber risk situation across all risk categories.

Substantial risks can arise from the product cybersecurity area. In product development, a particular focus is therefore given to the implementation of ISO/SAE 21434. Our cybersecurity development processes meet this standard and thus form a cybersecurity management system that enables our customers to homologate their vehicles according to UNECE R 155. A central team of cybersecurity assessors has been set up to support product releases. In addition, a Red Team monitors the automotive-specific threat situation and initiates reactions to possible security incidents. In parallel, a Blue Team is working centrally on advance development for emerging technologies.

In the ZF Group, data protection has the highest priority in all (application) areas: The aim is to effectively and comprehensibly protect the personal data of our employees and partners in company-internal processes as well as in our products.

Financial risks

As part of central financial risk management, we monitor and control liquidity, foreign currency, interest rate and counterparty risks as well as credit risks in order to safeguard our financial stability. Provisions regarding the individual risk types have been put in

place which determine how to assess and manage the particular risk. Where required, we hedge financial risks using appropriate instruments. Wherever possible and expedient, we use derivative financial instruments to manage interest and currency risks in particular. We also use hedge accounting if the prerequisites are met. ZF controls and hedges currency risks with a standardized model to hedge underlying transactions in foreign currencies and a uniform system landscape.

Higher interest rates in the relevant currencies EUR and USD as well as expected further interest rate increases combined with higher credit spreads lead to higher (re-)financing costs for ongoing variable financing. The development of alternative sources of finance with attractive conditions is intended to mitigate potential burdens. Variable-rate financial liabilities are partially hedged against rising interest rates by means of interest rate derivatives as of the balance sheet date.

Active cash and cost management helps us to limit the financial impact of the war in Ukraine and the Covid-19 pandemic and stabilize our liquidity. A revolving credit of €3.5 billion is still fully available as a liquidity reserve. Central cash pooling with sufficient cash and committed credit lines with matching maturities guarantees the necessary financial flexibility.

Risks are also associated with various loan agreements, e.g., the syndicated loan agreement of ZF Friedrichshafen AG and the loan agreement with the European Investment Bank. These agreements comprise not only obligations but also a financial covenant which has to be complied with at all times. A breach of this financial covenant would mean that, in the event of a respective claim, the creditor could demand immediate repayment of the loan or terminate the credit line. It was possible to maintain the financial covenant at all times.

In order to reduce counterparty risks within finance, we only transact with banks having first-class financial stability and within stipulated limits. The credit rating of our suppliers and customers is continually checked. In particular, there are risks to recognize impairments on financial assets.

Risks in the field of sustainability

Sustainability is of strategic importance to ZF. We proactively assume responsibility for sustainable management in all three dimensions: environmental, economic and social. Sustainability is defined as a binding target in our Next Generation Mobility corporate strategy. We will make appropriate investments that are required to improve our sustainability performance and prepare for new regulations, such as the supply chain legislation, or customer expectations. ZF has been collecting and reporting non-financial information in detail for years and actively involves different stakeholders. Developments are recorded systematically and early on and taken into account when coping with the associated risks.

The worldwide consequences of global warming include more frequent and intense extreme weather events such as floods, cyclones and droughts, which have so far only affected our locations in individual cases. Natural disasters such as the one in the German Ahrtal valley in the summer of 2021 can cause manifold problems for the ZF Group, e.g., disrupted supply chains. For example, economic activity in an entire region can be negatively affected. This would result in loss of income for consumers and would have a negative impact on their purchasing behavior. We manage the associated risks with an established environmental management system. We also access global systems to obtain real-time (risk) information about global safety-related events such as natural disasters, geopolitical developments and violent incidents. In this way, we can initiate appropriate measures proactively and reactively.

Legal and other risks

Due to the complexity of our business model with economic activities on all continents, we are generally exposed to the risk of legal disputes in areas such as product liability, competition law, environmental protection and taxation. Particularly in the USA, we are involved in proceedings whose outcome may have a substantial negative impact on our earnings. Accounting provisions for legal risks are made in accordance with the applicable accounting regulations. Furthermore, it cannot be completely ruled out that individual employees harm the company by violating applicable law in connection with their work activities, resulting in damage, e.g., to our reputation or earnings, due to payment or other obligations. In the event of investigations, we cooperate fully with the relevant authorities. However, ZF has created corresponding structures in order to ensure as far as possible that the different country-specific legal provisions are complied with and to control and minimize legal risks. Key elements are our global Compliance Organization, the ZF Code

of Conduct, the anonymous notification system for internal and external compliance notifications, and a comprehensive mandatory training concept. Membership in the Responsible Supply Chain Initiative (RSCI) association supports ZF's efforts to fulfill its supply chain obligations and thus contributes to reducing potential legal risks.

ZF is subject to high pension obligations, particularly in Germany. These pension obligations are covered to a varying extent completely or in part by plan assets. We invest the plan assets in a variety of asset classes that are exposed to corresponding fluctuations in value. A change in key parameters, such as interest rates of pension obligations, could lead to negative effects on ZF's earnings and equity.

In the course of audits, tax laws and relevant contracts or events could be interpreted and assessed in a different manner by local tax authorities than by ZF. This poses the risk of a claim for back taxes based on an adjustment to the tax base. Furthermore, tax law initiatives, to the extent that they have been transposed into national law, can influence future tax expenses or tax payments.

If company participations do not develop in accordance with our underlying business plan, we could be forced to make significant balance sheet depreciations.

KEY OPPORTUNITIES COMMENTARY

Company-specific opportunities

In the partly disruptive industries in which we operate as a global company, we continuously see new opportunities that we take into account for our plans and forecasts, provided they have a sufficient probability of occurrence. We use systematic scenario analyses to record long-term market and technology trends. Using trend and environmental analyses and maintaining close contact with customers, we are continuously working on identifying opportunities and leeways with the potential to improve our products' innovative design, production efficiency, market performance and cost structure.

Despite the imminent recession, the order situation improved in 2022 compared to the previous year. We were able to win a number of important contracts in the areas of electric mobility, including fully electric steering systems (steer by wire), advanced driver assistance systems and the relevant connected sensors and actuators. Order intake in the commercial vehicle sector is also developing positively. Our extensive portfolio in this segment was successfully presented at IAA Transportation in Hanover in September. Due to the worldwide interest in hydrogen energy and fuel cell technology, new growth fields are opened up, and our Wind Power Business Unit is also benefiting from strong market growth.

Since January 2022, we have secured the position as a leading technology provider in the commercial vehicle sector with the new Commercial Vehicle Solutions Division. ZF can thus offer a comprehensive product and system portfolio from a single source to serve truck, bus and trailer manufacturers as well as fleet operators in all regions.

We also see opportunities in the software sector. In this way, Group-wide synergies are to be used to increase the performance for internal and external customers, and to help ZF transform into a tech company.

Opportunities in the field of sustainability

With our Next Generation Mobility strategy, we have defined the Group's long-term orientation and formulated our goals. Legislators around the world are continuously tightening environmental and climate protection requirements for the industry. Our competitiveness will be closely linked to CO_2 emissions. Accordingly, we have embedded our action plan to achieve carbon neutrality by 2040 in the corporate strategy. The target path is certified by the independent Science Based Targets initiative (SBTi) for conformity with the Paris Agreement on climate change and the GHG Protocol. To this end, ZF not only focuses on its own plants and products, but takes the entire supply chain into account. This includes increasing the energy efficiency of our plants as well as fully switching to green energy, offering sustainable products with a small carbon footprint and simultaneously reducing emissions in the supply chain.

We see ZF well prepared for the further tightening of regulations on fuel consumption and emission standards for motor vehicles. The specifications will result in a higher demand for energy-efficient and low-emission drive solutions. Vehicle manufacturers are increasingly required to reduce fleet consumption through their mix of vehicles and drive systems. These factors are reinforcing the trend toward further electrification. With our extensive and continuously growing portfolio of systems and components for hybrid and electric drives as well as other products in the electric driveline, we are already providing solutions for passenger cars and commercial vehicles that enable customers to comply with such changes to the legal framework. We are continuously examining possible inorganic growth through acquisitions and participations in order to supplement our organic growth and strengthen our activities in pioneering fields.

We perceive sustainability as a competitive advantage. Our customers have also set ambitious sustainability goals, especially with regard to their own CO_2 emissions and those of their suppliers. Improving our carbon footprint can thus represent a competitive advantage and be decisive for the future awarding of contracts. The consistent implementation of our sustainability strategy, e.g., by strengthening our activities for an improved circular economy, also offers opportunities in terms of attracting and retaining employees. Sustainability-oriented companies are demonstrably more attractive employers; committing to sustainability also increases job satisfaction.

Moreover, sustainable actions are an important component of our financing strategy in cooperation with our banks and investors. The sustainability strategy has a direct effect on the valuation of our company by ESG rating agencies. Furthermore, sustainability criteria for financing and sustainable project financing can improve credit terms and broaden the investor base.

In order to underline the strategic relevance, ZF is linking the long-term incentive from 2023 to, among other things, indicators for reducing greenhouse gas emissions and increasing gender diversity.

Research and development opportunities

Our Next Generation Mobility strategy aims at providing clean, safe, comfortable and affordable mobility for everyone and everywhere to fit people's current and future lifestyles. This opens up sales opportunities for us. Our customers are increasingly focusing on the core functions required for their mobility portfolio, and we are already developing these features with customers and end customers in mind.

ZF is systematically reducing its dependency on internal combustion engines. With a modular overall concept consisting of electric motor, inverter, transmission and software, the new ZF electric drives support vehicle manufacturers flexibly and individually in the comprehensive electrification of their model ranges. For end customers, our new technologies offer greater efficiency – as they are smaller and lighter, while offering higher performance and shorter charging times. The great interest of manufacturers in our products and the resulting opportunities for us in both the passenger car and commercial vehicle sectors are confirmed by corresponding orders in the high-voltage business.

In the future, autonomous shuttle systems can be used as a supplement and expansion to relieve the burden on local public transportation, making it more flexible and also supporting urban areas in meeting climate targets. ZF is already one of the leading suppliers in this field and is continuously expanding its offer: The ZF Mobility Solutions Business Unit offers the set-up, operation and service of such innovative, purely electric and autonomous transportation systems from a single source. Several projects are underway, partly funded by the federal and state governments, as well as cooperations, among others with DB Regio.

Furthermore, EU projects such as the Joint Initiative for hydrogen Vehicles across Europe (JIVE) support the implementation of fuel cell buses and substantially push ahead their commercialization. Hydrogen may also be an alternative for transport companies in order to comply with the EU Clean Vehicles Directive, which stipulates a minimum quota for the new procurement of zero-emission vehicles. We are therefore investigating further applications for the development of fuel cell solutions together with our partners.

At the R&D Summit 2022, a clear guiding principle was announced for the global ZF engineering community: Software first. Our DevOps platform offers a scalable solution for consistent and fast software development and enables international cooperation.

ZF's middleware can accelerate development processes and significantly reduce the complexity of integrating hardware and software. It acts as a standardized link between a vehicle's software applications and hardware components. This approach minimizes the number of interfaces, guarantees fast communication between all system parts and helps our customers to significantly reduce the complexity of system integration. Our powerful middleware was also decisive for the successful implementation of a service-oriented software architecture (SOA). It offers enormous advantages with regard to reuse and flexibility and is thus an important component in ZF's portfolio in order to make the software-defined vehicle of tomorrow even more efficient.

Digitalization and information technology opportunities

Digitalization, the Internet of Things (IoT) and artificial intelligence (AI) offer us numerous opportunities along our value chain. Therefore, we are continuously adding new digital products and services to our existing business model and transforming existing processes.

This also applies to the area of production where the smart factory with Industry 4.0 processes is to become a reality. Several plants in all regions have already been connected to the cloud-based Digital Manufacturing Platform which can be used to transform production processes, and whose insights are to be used throughout the Group. In view of the current challenges and possible disruptions in supply chains, inventory management has top priority in production. The objective is to develop best practice processes that can be quickly adapted to changed conditions and adopted by everyone. This also applies to other organizations. They will be able to use proven solutions that effectively reduce maintenance costs, predict failures and optimize material availability, among other things.

With the now.digital strategy launched in 2022, ZF is accelerating digital transformation. In doing so, we consistently rely on the ZF Cloud to develop new digital products, make internal Group processes more efficient or operate digital business models. Applications such as autonomous driving, predictive maintenance or mobility as a service (MaaS) require huge amounts of data, flexible computing capacities and smart algorithms that users must be able to access from anywhere. Development engineers can test new software in no time at all. Purchasing and logistics benefit from this because the cloud provides seamless end-to-end visibility across the supply chain and a faster response to challenging market developments. The successful cloud transformation is one of the top priorities in the Group, combined with a modernization of the application landscape at ZF.

Many challenges in the automotive industry can only be mastered by joining forces. Therefore, ZF is a founding member of Catena-X. Together with renowned partner companies, ZF launched the initiative as an open network for the automotive industry and adjacent industries. It focuses on secure, standardized information and data exchange between companies. Among other things, standardized data along the entire value chain allow components and software to be traced. It can also make supply chains more transparent and thus meet demanding sustainability criteria, such as reducing the carbon footprint in production and logistics.

Data is the future of mobility. ZF has founded the Data Venture Accelerator (DVACC) for this purpose. In close cooperation with our divisions, a model was developed that pools the technical and customer knowledge of the divisions and the digital competence of Corporate Development. The DVACC is focused, flexible and aims to achieve its goal quickly. The results-oriented approach of the globally distributed teams combines the traditional ZF strengths with the entrepreneurial spirit of a start-up.

OVERALL STATEMENT ON THE OPPORTUNITY AND RISK SITUATION

The ZF Group works to counter the above risks using a risk management system that is embedded in an integrated GRC approach. It includes the global organization through a decentralized approach and equally covers divisions, cross-sectional functions and regions. Our decentralized risk management approach stipulates that risks are managed where they occur to ensure that those who have the best overview and know-how with regard to the respective risk category take action. The risk management system is integrated in our operational and strategic business activities. The risk management method is subject to a continuous improvement process. The Opportunities Report represents a consolidated observation of significant opportunities in the period under review. Wherever cost-effective and within the Group's sphere of influence, we do our best to develop these.

Based on currently available information as well as the individual risks illustrated in the financial statement and set out in this report, we can identify no additional opportunities and risks which may substantially influence the ZF Group's results of operations, net assets and financial position in fiscal year 2023. The Group's financial situation is stable; the need for financial means is covered by existing liquidity and available credit lines.

Given our market position and the precautions we have taken, we are confident in our ability to control these risks and meet the resulting challenges. When analyzing the overall picture of significant risks and opportunities, no risks can be identified which could jeopardize the company's continued existence, either alone or in combination with other risks.

Forecast Report

INDUSTRY ENVIRONMENT TRENDS

> **The global economic situation remains challenging in 2023.**
> **Recessive trends make a thorough recovery of the major ZF industries unlikely.**

Markets remain under pressure with significant risk scenarios

The continuing challenges in the global fight against the pandemic, the effects of the Russia-Ukraine crisis and the only gradually decreasing burden on supply chains, combined with potential problems in energy supply, especially in Europe and Germany, lead to a recession risk in these markets. The first months of 2023 are characterized by risk scenarios. Based on the current indications and the countermeasures initiated by the central banks in the eurozone and the USA, the peak of inflation has already been exceeded at the beginning 2023. Nevertheless, inflation remains at a comparably high level. However, the monetary policy measures – taken so far and still to come – conflict with a robust, strong recovery in global economic growth. Furthermore, the already visible impacts of climate change present the global economies with new, sometimes unforeseeable challenges but also with opportunities. Global economic growth could reach up to 2.5% this year. Here, slightly improved prospects for China, stating 4.3% growth, are facing zero growth in the eurozone and only slightly positive trends in the USA, but also in large emerging economies such as Brazil and Mexico. An exception is India, for which solid growth of more than 5% is forecast in 2023. However, the geopolitical situation can further aggravate the global economic situation.

The challenges in the global economy put a strain on the outlook of the industries ZF operates in

The rather slow alleviation of the effects from the supply bottlenecks as well as the expected weak economic development in the first months of 2023, especially in Europe and Germany, still intensified by potential energy bottlenecks, but in any case massively increased energy costs, are again slowing down the expectations regarding a thorough recovery of the core ZF industries.

The market for passenger cars and light commercial vehicles in particular would have enormous catch-up potential – after the massive declines caused by the crises and the resulting increased demand for replacement, especially in the established markets. Against the backdrop of the negative prospects described at the beginning of 2023, however, a further slight decline in vehicle production can be expected. While markets in Asia should stay close to the zero line, North and South America might show minor growth. The signs in Europe with the persistent buying restraint caused by the recession indicate a further decline in production.

The developments in China continue to dominate the heavy commercial vehicle market. After the correction effects of the previous two years with –20% and –48%, the Chinese market should again be able to show moderate growth of up to 10%. The accumulated demand in Europe also indicates slight growth potential. The situation in North America is different: After two years of double-digit growth, there is a stabilization at the level achieved, while South America could return to normal levels after 60% and 10% in the previous two years with a downward correction of –13%.

The forecast for the industrial markets ranges from moderate growth in the wind power market, especially in Asia, to stagnation in the global construction machinery market, to weaker expectations for the agricultural machinery markets, especially driven by a sharper decline in China.

Overall, it is a difficult environment, caused by geopolitical risks and fear of recession and inflation, which in particular affect private demand and subsequently also the demand for investment goods. Based on the gradually positive news which results in increasing consumer confidence, it could be possible to leave the trough in the course of 2023.

DEVELOPMENT OF THE GROUP

> **With regard to the transformation of the automotive industry, ZF is further pushing investments in future-oriented technologies.**
> **For a better quality of results, ZF will further adapt organizational and Group structures to market developments.**

Sales forecast

Assuming stable exchange rates, ZF expects a slight increase in Group sales for 2023 to a volume of more than €45 billion.

Despite the slight decline in vehicle production, we expect a slight increase in sales thanks to new product launches in the passenger car and light commercial vehicle sectors. Above all the Electrified Powertrain Technology Division with its products for electric mobility as well as the Electronics and ADAS Division contribute to this.

Due to the expected positive development of vehicle production for heavy trucks, we also expect a sales increase in the Commercial Vehicle Solutions Division. The products in the areas of electric mobility, systems business, brakes, steering systems and transmissions are the main drivers here.

For the Industrial Technology Division, we expect a slight sales increase across almost all business units both for existing and new technologies.

For the Aftermarket Division, that covers the spare parts and service business, we expect sales to match last year's level.

With the expected development of the sales and procurement markets in conjunction with a corresponding control of the cost structures, we consider an adjusted EBIT margin between 4.7% and 5.2% to be attainable.

For this fiscal year, we assume that the free cash flow adjusted for company transactions will be between €1.0 billion and €1.5 billion. The estimate is based on the planned development of the operational business as well as the continuation of consistent working capital management.

T. 06 Forecast

	FORECAST 2023	REPORTED 2022
Sales in € billion	> 45.0	43.8
Adjusted EBIT margin in %	4.7 – 5.2	4.7
Adjusted free cash flow in € billion	1.0 – 1.5	0.5

For the fiscal year 2023, we expect a slight increase in the number of employees, especially in the Asia-Pacific region.

The general conditions in 2023 remain challenging. Effects on the forecast with regard to uncertainties due to the geopolitical situation and continued supply bottlenecks cannot be ruled out.

ZF on the right track

The speed of transformation in the automotive industry continues. This is mainly due to the development towards a sustainable economy with significantly reduced CO_2 emissions. The general conditions in 2023 remain challenging. Against this backdrop, ZF is pushing investments in future-oriented technologies. We will further adapt our organizational and corporate structures to market developments in order to sustainably improve the quality of our company's results.

Supported by the trust of our customers, the close cooperation with our suppliers and business partners as well as our employees' commitment and willingness to change, we are convinced that ZF will successfully master the current challenges.

Friedrichshafen, February 28, 2023
ZF Friedrichshafen AG
The Board of Management

Consolidated Financial Statements

Contents

Consolidated Statement of Profit or Loss

ZF FRIEDRICHSHAFEN AG FOR THE PERIOD DATING JANUARY 1 TO DECEMBER 31, 2022

in € million	Notes	2022	2021
Sales	1	43,801	38,313
Cost of sales	2	36,904	31,779
Gross profit on sales		**6,897**	**6,534**
Research and development costs	9	2,790	2,596
Selling expenses		1,673	1,563
General administrative expenses		1,442	1,373
Other operating income	3	828	584
Other operating expenses	4	696	390
Result from associates	5	–18	220
Other net result from participations	5	3	5
EBIT		**1,109**	**1,421**
Financial income	6	1,147	536
Financial expenses	7	1,694	875
Net profit or loss before tax		**562**	**1,082**
Income taxes	8	186	299
Net profit or loss after tax		**376**	**783**
thereof shareholders of ZF Friedrichshafen AG		227	660
thereof non-controlling interests		149	123

Consolidated Statement of Comprehensive Income

ZF FRIEDRICHSHAFEN AG FOR THE PERIOD DATING JANUARY 1 TO DECEMBER 31, 2022

in € million	Notes	2022	2021
Net profit or loss after tax		**376**	**783**
Line items that will be reclassified in the consolidated statement of profit or loss			
Foreign currency translation differences			
Gains arising during the year		175	819
Mark-to-market of cash flow hedges			
Gains arising during the year (2021: losses)		16	–16
Reclassification adjustments for gains/losses included in profit or loss		22	–20
Income taxes		–13	13
		200	**796**
Line items that will not be reclassified in the consolidated statement of profit or loss			
Mark-to-market of securities		10	–7
Actuarial gains from pension obligations		1,609	1,277
Income taxes		–515	–362
		1,104	**908**
Other comprehensive income after tax	**25**	**1,304**	**1,704**
Total comprehensive income		**1,680**	**2,487**
thereof shareholders of ZF Friedrichshafen AG		1,545	2,323
thereof non-controlling interests		135	164

Consolidated Statement of Financial Position

ZF FRIEDRICHSHAFEN AG AS OF DECEMBER 31, 2022

Assets in € million	Notes	Dec. 31, 2022	Dec. 31, 2021
Current assets			
Cash and cash equivalents		2,518	2,332
Financial assets	10	156	148
Trade receivables	11	5,967	5,617
Contract assets	12	421	235
Other assets	13	847	767
Income tax receivables		37	74
Inventories	14	5,597	4,993
		15,543	**14,166**
Assets held for sale and disposal groups	27	168	88
		15,711	**14,254**
Non-current assets			
Financial assets	10	590	970
Associates	15	116	199
Contract assets	12	431	355
Other assets	13	277	263
Intangible assets	16	12,396	12,768
Property, plant and equipment	17	8,456	8,191
Deferred taxes	8	967	1,359
		23,233	**24,105**
		38,944	**38,359**

Liabilities and equity in € million	Notes	Dec. 31, 2022	Dec. 31, 2021
Current liabilities			
Financial liabilities	20	2,238	1,092
Trade payables		7,010	5,855
Contract liabilities	21	1,581	1,506
Other liabilities	22	1,761	1,837
Income tax provisions		438	459
Other provisions	23	849	824
		13,877	**11,573**
Liabilities of disposal groups	27	90	59
		13,967	**11,632**
Non-current liabilities			
Financial liabilities	20	10,798	11,499
Trade payables		14	30
Contract liabilities	21	434	560
Other liabilities	22	155	204
Income tax liabilities		46	80
Provisions for pensions	24	3,551	5,680
Other provisions	23	757	865
Deferred taxes	8	627	686
		16,382	**19,604**
Equity			
Subscribed capital	25	500	500
Capital reserve	25	386	386
Retained earnings[1]	25	7,167	5,741
Equity attributable to shareholders of ZF Friedrichshafen AG		**8,053**	**6,627**
Non-controlling interests		542	496
	25	**8,595**	**7,123**
		38,944	**38,359**

1) Assets held for sale and disposal groups account for €1 million (2021: –€16 million)

Consolidated Statement of Cash Flows

ZF FRIEDRICHSHAFEN AG FOR THE PERIOD DATING JANUARY 1 TO DECEMBER 31, 2022

in € million	Notes	2022	2021
Net profit or loss before income tax		562	1,082
Depreciation and amortization/impairments		2,334	2,226
Results from first-time consolidation and deconsolidation		−62	1
Net result from participations and net financial result		562	114
Results from the disposal of intangible assets and property, plant and equipment		−15	−4
Other non-cash changes		−36	0
Income taxes paid		−420	−456
Changes in non-current provisions made through profit or loss		−67	184
Increase in inventories		−616	−722
Increase (2021: decrease) in trade receivables		−355	150
Increase in other assets		−392	−399
Increase in trade payables		1,154	5
Decrease (2021: increase) in other liabilities		−460	238
Cash flow from operating activities		**2,189**	**2,419**
Expenditures for investments in			
intangible assets		−81	−82
property, plant and equipment		−1,705	−1,464
associates and other participations		−14	−60
financial receivables		−21	−21
securities		−135	−301
Proceeds from the disposal of			
intangible assets		4	4
property, plant and equipment		56	68
associates and other participations		0	244
financial receivables		13	20
securities		162	318

in € million	Notes	2022	2021
Cash inflow from the sale of consolidated companies	29	128	236
Cash outflow from the acquisition of consolidated companies	30	0	9
Cash outflow from financial guarantees		−109	0
Dividends received		42	8
Interest received		48	16
Cash flow from investing activities		**–1,612**	**–1,005**
Dividends paid to ZF Friedrichshafen AG shareholders		−119	0
Dividends paid to non-controlling interests		−84	−59
Repayments of borrowings	31	−1,419	−2,302
Proceeds from borrowings	31	1,581	1,174
Interest paid and transaction costs		−350	−352
Cash flow from financing activities		**–391**	**–1,539**
Net change in cash position		**186**	**–125**
Cash position at the beginning of the fiscal year		2,332	2,341
Effects of exchange rate changes on cash position		12	116
Cash position as of the closing date	28	**2,530**	**2,332**

Consolidated Statement of Changes in Equity

ZF FRIEDRICHSHAFEN AG FOR THE PERIOD DATING JANUARY 1 TO DECEMBER 31, 2022

			Retained earnings							
in € million	Subscribed capital	Capital reserve	Other retained earnings	Foreign currency translation differences	Mark-to-market of securities	Mark-to-market of cash flow hedges	Actuarial gains and losses	Equity attributable to shareholders of ZF Friedrichshafen AG	Non-controlling interests	Group equity
Jan. 1, 2021	**500**	**386**	**6,601**	**–1,007**	**–5**	**20**	**–2,391**	**4,104**	**339**	**4,443**
Net profit or loss after tax			660					660	123	783
Other comprehensive income after tax			4	776	–6	–25	914	1,663	41	1,704
Total comprehensive income	**0**	**0**	**664**	**776**	**–6**	**–25**	**914**	**2,323**	**164**	**2,487**
Changes in the basis of consolidation								0	11	11
Dividends paid								0	–59	–59
Disposal of shares in consolidated companies			200					200	41	241
Other changes			–8		8			0		0
Dec. 31, 2021	**500**	**386**	**7,457**	**–231**	**–3**	**–5**	**–1,477**	**6,627**	**496**	**7,123**
Jan. 1, 2022	**500**	**386**	**7,457**	**–231**	**–3**	**–5**	**–1,477**	**6,627**	**496**	**7,123**
Net profit or loss after tax			227					227	149	376
Other comprehensive income after tax				184	12	30	1,092	1,318	–14	1,304
Total comprehensive income	**0**	**0**	**227**	**184**	**12**	**30**	**1,092**	**1,545**	**135**	**1,680**
Changes in the basis of consolidation								0	–5	–5
Dividends paid			–119					–119	–84	–203
Other changes			2				–2	0		0
Dec. 31, 2022	**500**	**386**	**7,567**	**–47**	**9**	**25**	**–387**	**8,053**	**542**	**8,595**

Notes to the Consolidated Financial Statements

OF ZF FRIEDRICHSHAFEN AG FOR 2022

FUNDAMENTAL PRINCIPLES

Corporate structure

ZF Friedrichshafen AG is a corporation, of which 93.8% is owned by the Zeppelin Foundation and 6.2% by the Dr. Jürgen and Irmgard Ulderup Foundation. The company is headquartered in 88046 Friedrichshafen, Germany, Löwentaler Straße 20 and is listed in the commercial register of the municipal court of Ulm under the number HRB 630206.

Further explanations on the corporate structure can be found in the management report.

General

The line items of the consolidated statement of profit or loss, the consolidated statement of comprehensive income, the consolidated statement of financial position, the consolidated statement of cash flows and the consolidated statement of changes in equity are broken down and explained in the notes to the consolidated financial statements.

The Group's currency is the euro. Unless otherwise stated, all amounts are reported in millions of euros (€ million).

The Board of Management of ZF Friedrichshafen AG approved these consolidated financial statements on February 28, 2023, and forwarded them to the Supervisory Board.

The consolidated financial statements, which were prepared as of December 31, 2022, as well as the Group management report will be announced in the Business Register.

The consolidated statement of financial position is broken down by maturities. The financial line items are divided into non-current and current assets and/or liabilities on the basis of whether they have a residual term of more than one year or up to one year, respectively.

Assets and liabilities included in a disposal group classified as held for sale as well as assets held for sale are presented separately from other assets and liabilities in the consolidated statement of financial position.

The recognition of assets and liabilities is carried out according to the historical cost principle. This does not include derivative financial instruments, securities and investments in participations that are recognized at fair value.

Adoption of IFRS

As a company that is not publicly traded, ZF Friedrichshafen AG has chosen the option to draw up its consolidated financial statements on the basis of IFRS pursuant to Sec. 315e (3) HGB (German Commercial Code).

The consolidated financial statements are in accordance with the standards and interpretations valid on the reporting date and issued by the International Accounting Standards Board (IASB), London, as adopted by the EU, and the additional requirements of German commercial law pursuant to Sec. 315e (3) in conjunction with Sec. 315e (1) HGB.

In fiscal year 2022, the following amended standards were applied for the first time:

- Amendments to IFRS 3 "Reference to the Conceptual Framework"
- Amendments to IAS 16 "Proceeds before Intended Use"
- Amendments to IAS 37 "Onerous Contracts – Cost of Fulfilling a Contract"
- Improvements to IFRS 2018–2020

The amendments to IAS 37 provide clarifications regarding the costs to be taken into account by a company in determining whether a contract is to be classified as loss-making. Since the clarification corresponds to the previous procedure of the consolidated ZF Group, the amendments will not have an essential effect on the consolidated financial statements.

The first-time application of the other amendments to standards did not lead to any change in accounting within the consolidated ZF Group.

Further standards and interpretations issued or revised by the IASB were not yet applied by ZF in fiscal year 2022 because either the application of these standards and interpretations was not yet mandatory or the European Union had not yet endorsed them. ZF will not adopt any of these standards or standard amendments earlier.

Standard/ Interpretation	Title	Applicable pursuant to IFRS as of	Endorsement by EU	Expected impact
IAS 1	Amendments to IAS 1 "Classification of Liabilities as Current or Non-Current"	Jan. 1, 2024	No	None
IAS 16	Amendments to IFRS 16 "Lease Liability in a Sale and Leaseback"	Jan. 1, 2024	No	None
IAS 1	Amendments to IAS 1 "Disclosure of Accounting Policies"	Jan. 1, 2023	Yes	None
IAS 8	Amendments to IAS 8 "Definition of Accounting Estimates"	Jan. 1, 2023	Yes	None
IAS 12	Amendments to IAS 12 "Deferred Tax related to Assets and Liabilities arising from a Single Transaction"	Jan. 1, 2023	Yes	None
IFRS 17	Amendments to IFRS 17 "Initial Application of IFRS 17 and IFRS 9 – Comparative Information"	Jan. 1, 2023	Yes	None
IFRS 17	Insurance Contracts	Jan. 1, 2023	Yes	None

The amendments to IAS 1 "Classification of Liabilities as Current or Non-Current" essentially contain clarifications relating to the classification of liabilities as current or non-current and in particular affect rights to defer settlement. Since the clarification corresponds to the previous procedure of the consolidated ZF Group, the amendments are not expected to affect the consolidated financial statements.

The Group currently also does not expect that the other changes in the new or amended standards in their current form will have a significant impact on the presentation of financial statements.

Basis of consolidation

In addition to ZF Friedrichshafen AG, 41 German and 307 international subsidiaries controlled by ZF Friedrichshafen AG are included in the consolidated financial statements.

The following table shows the composition of the consolidated ZF Group (without ZF Friedrichshafen AG):

	Jan. 1, 2022	First-time consolidations	Legal changes	Deconsoli-dations	Dec. 31, 2022
Subsidiaries	344	14	−4	−6	348
of which German	40	2	0	−1	41
of which international	304	12	−4	−5	307
Joint ventures	4	0	0	0	4
Associates	14	0	0	0	14

Company acquisitions in the prior-year period

By way of a purchase contract dated December 29, 2021, and effective December 30, 2021, 1% of the shares of Rane TRW Steering Systems Private Limited, Chennai (India), were acquired, which led to an increase of the participation quota to 51%. The company's line of business is the manufacture and sale of products and components for the automotive industry. Among other things, the product portfolio comprises power steering systems, seat belts and airbags. With the acquisition of the majority stake, ZF further expanded its passenger car and truck business in the Region of India.

The finalization of the purchase price allocation particularly resulted in effects on property, plant and equipment in the medium double-digit million range for the period from January 1 to December 29, 2022, which led to a reduction in goodwill.

Company disposals

On June 2, 2021, an agreement was reached with Airbus Helicopters Deutschland GmbH on the sale of the Aviation Technology Business Unit. The sale of the shares in ZF Luftfahrttechnik GmbH, headquartered in Calden (Germany), was concluded with effect from December 31, 2022. The disposal led to a deconsolidation income of €103 million that was recognized under other operating income. The assets and disposal groups or liabilities of disposal groups held for sale in the consolidated statement of financial position in the previous year relate to the assets and liabilities of ZF Luftfahrttechnik GmbH.

As a result of the Russia-Ukraine war, the shares in OOO ZF Kama, headquartered in Naberezhnye Chelny (Russia), were sold with effect from September 12, 2022. The disposal led to a deconsolidation loss of €25 million that was recognized under other operating expenses.

Consolidation principles

The consolidation of investments in subsidiaries is carried out according to the purchase method. When control is obtained, the revalued assets and liabilities of the subsidiary and contingent liabilities, if they do not depend on a future event, are offset against the fair value of the consideration paid for the shares. Contingent purchase price payments are recognized at the amount expected. Subsequent adjustments of contingent purchase price payments are recognized in profit or loss. Acquisition-related expenses are recognized in profit or loss when they are incurred.

Any excess remaining after capital consolidation is recognized as goodwill and recorded under intangible assets. The goodwill is tested for impairment as of the reporting date. An impairment test is performed during the year if there are any triggering events. Negative differences arising on the consolidation of investments in subsidiaries are recognized in profit or loss in the consolidated statement of profit or loss under other operating income.

If not all interests are acquired during an acquisition, the non-controlling interests can be recognized at the amount of the proportionally revalued net assets or at their proportional total company value including the applicable goodwill. This right of choice is applicable to every company acquisition. As of December 31, 2022, all non-controlling interests are reported with the proportional net assets.

In the case of a step acquisition, the already existing interests in the company which has not yet been consolidated are revalued at fair value at the date when control is obtained. The difference to the carrying amount of the investment is recognized in profit or loss.

The acquisition of additional interests of already fully consolidated subsidiaries is recognized as an equity transaction. In this method, the difference between the cost of the investment acquired and the carrying amount of the non-controlling interest is recognized in retained earnings. The effects of a sale of interests, which does not lead to a loss of control over a subsidiary, are to be recognized in other comprehensive income with no effect on profit or loss by offsetting the capital gain or loss against retained earnings and by increasing the non-controlling interests to the amount of the proportional net assets.

The deconsolidation of subsidiaries is carried out on the date of the loss of control or the date of liquidation. The gain or loss on deconsolidation is recognized in other operating income or expenses, respectively. Remaining interests are recognized at fair value under associates.

Consolidation of receivables, liabilities, provisions, income and expenses as well as gains or losses is effected for the companies included in the basis of consolidation. Guarantees and warranties between consolidated companies are eliminated.

Foreign currency translation

The financial statements of consolidated Group companies prepared in foreign currencies are translated on the basis of the concept of functional currency by the modified closing rate method. Since the subsidiaries operate independently from a financial, economic and organizational point of view, the functional currency is generally identical with the company's local currency. Accordingly, the income and expenses in the financial statements of subsidiaries drawn up in foreign currencies are translated in the consolidated financial statements applying average rates, and assets and liabilities at the closing rate. The exchange difference resulting from the translation of equity at historical rates and the exchange differences resulting from the translation of the statement of profit or loss at the average exchange rate are recognized in other comprehensive income in equity without effect on profit or loss.

Upon initial recognition, foreign currency receivables and liabilities are measured at the rate valid on the day of transaction in the individual financial statements of ZF Friedrichshafen AG and its subsidiaries. The closing rate on the reporting date will be used for subsequent measurements. Foreign exchange gains and losses from the revaluation of trade receivables and trade payables on the reporting date are recognized in other income and expenses. Foreign exchange gains and losses from financial assets and liabilities are generally recognized within other financial income and financial expenses. To the extent that non-current financial receivables or liabilities denominated in foreign currency exist toward a foreign operation, the settlement of which is neither planned nor likely in the foreseeable future, any translation differences are not recognized in profit or loss in other financial income and expenses, but directly in equity as other comprehensive income. A transfer to the consolidated statement of profit or loss only occurs upon repayment or sale of the foreign operation.

The translation of any goodwill carried in foreign currency is based on the closing rate as of the reporting date. The differences resulting from currency translation are recognized in equity through other comprehensive income as foreign currency translation differences.

The exchange rates used for foreign currency translation with a significant influence on the consolidated financial statements changed as follows in relation to one euro:

	Closing rate		Average rate	
	Dec. 31, 2022	Dec. 31, 2021	**2022**	2021
U.S. dollar	1.0666	1.1326	1.0533	1.1833
British pound	0.8869	0.8403	0.8530	0.8599
Chinese renminbi	7.3582	7.1947	7.0847	7.6328
Brazilian real	5.6386	6.3101	5.4424	6.3816
Mexican peso	20.8560	23.1438	21.1982	23.9903

Accounting policies

The financial statements of ZF Friedrichshafen AG and the companies included in the consolidated financial statements are drawn up as of December 31 of each fiscal year, applying uniform Group accounting principles.

Recognition of expenses and income

Sales are recognized in accordance with IFRS 15 at the date when control over the product or the service is obtained by the customer. The assessment is made separately for each type of performance promise. The amount of sales is determined by the contractual agreement. To the extent that the purchase price refers to multiple sales transactions, the transaction price is allocated appropriately to the individual sales transactions.

Sales from selling products and tools as well as the reimbursement of development expenses are recognized at a point in time, i.e., once ownership or control is transferred to the customer. Income from service and license contracts are recognized either at a point in time or over a period of time, depending on the respective contractual structure. Sales are reported net of cash discounts, price reductions, customer bonuses and rebates.

Additional explanation regarding revenue recognition in accordance with IFRS 15 can be found in the notes on judgments.

Cost of sales comprises the cost of conversion of products sold as well as the purchase costs of sold merchandise. In addition to the directly attributable material and production costs, it also includes indirect production-related overheads, including depreciation on property, plant and equipment used and amortization of intangible assets. Cost of sales also includes write-downs of inventories to the lower net realizable value.

Research costs and non-capitalizable development costs are recognized in profit or loss when incurred.

Borrowing costs that are directly attributable to the acquisition or production of an asset which requires a considerable amount of time in order to be brought into the intended usable or sellable state are recognized as part of the cost of that asset. All other borrowing costs are recognized immediately as expenses.

Interest income is recognized in profit or loss when it is incurred.

Dividend income is recognized at the time the payout entitlement arises.

Hedging transactions

Derivative financial instruments are used at the consolidated ZF Group for hedging in order to reduce foreign currency and raw material price risks as well as interest rate and market price risks. If the criteria for hedge accounting are met, they are accounted for as fair value hedges, cash flow hedges or hedges of a net investment in a foreign business.

If hedge accounting is not applicable, the derivative financial instruments are measured at their fair values and changes in fair value are recognized through profit or loss in the net financial result.

Fair value hedges are used to hedge risks of changes in the value of items recognized in the statement of financial position. If the criteria are met, the results from fair value adjustment on derivative financial instruments and the underlying hedged items are reflected in profit or loss.

Cash flow hedges are used to hedge exposure to variability in future cash flows. If the market value of derivative financial instruments – used for cash flow hedges – changes, the unrealized gains and losses in the amount of the effective portion are initially recognized in other comprehensive income without affecting profit or loss. Reclassification to the consolidated statement of profit or loss is effected in the same period during which the hedged transaction affects profit or loss. The ineffective part of market value changes is reflected directly in the consolidated statement of profit or loss.

In the case of hedges of a net investment in a foreign operation, the changes in the value of the designated hedging instrument are recognized in the foreign currency translation differences item in other comprehensive income, analogous to the hedged item. The cumulative currency effects of the hedging instrument are not reclassified into the consolidated statement of profit or loss until the net investment in a foreign operation is sold or liquidated.

The profit and loss derived from hedging in connection with hedging operating transactions is recognized under other income and expenses or as part of acquisition costs. The gains and losses from derivative financial instruments used to hedge interest rate, market price or foreign currency risks related to financial assets or liabilities are shown under other financial results.

Cash and cash equivalents

Cash and cash equivalents comprise cash on hand, bank deposits available any time and short-term overnight money.

Financial assets

In general, the classification of current and non-current financial assets in accordance with IFRS 9 is based on the following three measurement categories:

- at amortized cost (AC)
- at fair value through other comprehensive income (FVtOCI) or
- at fair value through profit or loss (FVtPL)

The classification into the relevant measurement category is determined by the business model based on the management of the respective financial asset and by the contractual cash flow characteristics of the financial asset.

If the financial asset can be allocated to the “Hold” business model and if the cash flows collected are solely payments of principal and interest, the asset is measured at amortized cost (AC). The initial measurement is based on the fair value including transaction costs, while subsequent measurement is based on amortized cost. This measurement category primarily includes trade receivables held to maturity as well as financial receivables and cash and cash equivalents.

If the financial asset can be allocated to the “Hold and Sell” business model and if the cash flows collected are solely payments of principal and interest, the asset is measured at fair value through other comprehensive income (FVtOCI). Fair value changes recognized in other comprehensive income are reclassified to the statement of profit or loss upon the disposal of the financial asset, except in the case of equity financial instruments. The initial measurement is based on fair value including transaction costs, while subsequent measurement is based on fair value. This measurement category may be used for trade receivables to the extent that these are held to maturity or sold prior to maturity.

To avoid mismatches in terms of recognition or measurement, a financial asset that falls within the scope of one of the two measurement categories mentioned above may, alternatively, be measured at fair value through profit or loss (FVtPL). This measurement category is currently not in use.

Financial assets that do not meet the above-mentioned criteria regarding business model and cash flow characteristics are recognized at fair value through profit or loss (FVtPL). Both initial measurement and subsequent measurement are based on fair value. Among other things, this measurement category includes securities, investments in participations, derivative financial instruments as well as a share of other receivables.

Alternatively, if certain prerequisites are met, assets within the scope of this measurement category may also be measured at fair value through other comprehensive income (FVtOCI). ZF uses this option for equity instruments not held for trading (for example, instruments held in the portfolio for strategic reasons). Subsequently, all future changes in fair value have to be recognized in other comprehensive income; after the derecognition of the financial instrument, these changes remain within equity. Only dividend income is recorded through profit or loss.

Financial instruments measured at amortized cost mainly comprise current receivables. Impairments on these receivables are determined using the simplified model for the recognition of expected credit losses (loss allowance based on creditworthiness). This results in an earlier recognition of losses since not only incurred losses are taken into account, but also losses expected for the future. For this purpose, ZF applies a rating-based model to determine loss rates of receivables and contract assets. This involves the classification of customers into four risk categories. This risk classification is based on credit metrics provided by the external rating agency (Allianz Trade) and takes into account both past and forward-looking information. Changes in the customers' creditworthiness are recorded within the framework of a regular monitoring process. The basis for the calculation of the general credit-based loss allowances are the respective gross receivables, less credit-based specific loss allowances and the expected probability of default. Based on empirical values, the expected probabilities of default for trade receivables in fiscal year 2022 were adjusted, which resulted in a reduction in credit-based loss allowances.

Cash and cash equivalents are normally not reviewed in more detail as to a potentially existing credit risk.

A significant increase in credit risk is assumed to exist when the risk category has deteriorated.

Risk category	Risk	Probability of default	Definition of category
Risk category 1	Low risk	0.10–0.175%	Customers have a small credit risk and a strong ability to meet their payment obligations.
Risk category 2	Medium risk	0.375–1.50%	Customers have a medium credit risk and a good ability to meet their payment obligations.
Risk category 3	High risk	3.00–8.25%	Customers have an increased credit risk and a sufficient ability to meet their payment obligations.
Risk category 4	In default/ insolvent	14.00%	Customers have a high credit risk. It can be expected that the customers cannot meet their payment obligations in whole or in part.

As a rule, financial assets are capitalized as of the settlement date.

A financial asset is derecognized as of the settlement date when the contractual rights to receive cash flows from the asset have expired or substantially all risks and rewards have been transferred. A derecognition is performed once it is established that the trade receivables as well as financial receivables are uncollectible.

Contracts to buy or sell non-financial items that ZF entered into and continues to hold for the purpose of the receipt or delivery of a non-financial item in accordance with the expected purchasing, sale or usage requirements, are not part of the scope of IFRS 9. Instead, these contracts are accounted for as pending business in accordance with IAS 37.

Inventories
As a general rule, raw materials and supplies as well as merchandise are measured at their average cost taking into consideration the lower net realizable value. Work in progress and finished goods, including development expenses to be reimbursed by customers, are recognized at cost of conversion, taking into account the lower net realizable value. The cost of conversion includes all costs directly attributable to the manufacturing process and appropriate portions of the production-related overheads.

This includes production-related depreciation, prorated general administrative expenses and prorated social expenses.

Contract assets
Contract assets comprise contingent customer receivables. This includes development expenses, which are being reimbursed through the component price within the framework of volume production delivery. After the transition of the development results to the customer, these expenses are derecognized from inventories and recognized as contingent customer receivables in contract assets. Furthermore, this item contains contingent receivables arising from price agreements with customers.

Investments in associates and joint ventures
Investments in associates and joint ventures are generally recognized in accordance with the equity method with the proportionate equity. If, on the reporting date, there is objective evidence for the impairment of an investment, an impairment test is performed. The share of the consolidated ZF Group in the profit for the period of the associate or joint venture, respectively, and income and expenses related to such shares are recognized separately in the consolidated statement of profit or loss. Income and expenses that are directly recognized in the equity of the associate or joint venture are recognized in the consolidated ZF Group without effect on profit or loss as well.

Intangible assets
Purchased or internally generated intangible assets are capitalized if a future economic benefit can be expected from the use of the asset and the costs of the assets can be reliably determined.

For recognition and measurement of goodwill, please refer to the explanations on the consolidation principles.

Development costs that are not reimbursed by the customer are capitalized at cost of conversion in as far as both technical feasibility and marketability are ensured. It must furthermore be sufficiently probable that the development activity will generate future economic benefits. Capitalized development costs comprise all costs directly attributable to the development process.

Capitalized development costs are amortized from the start of production over an expected product life cycle of one to eight years.

Other intangible assets are recognized at cost and amortized based on the following useful lives:

	in years
Software	3 to 5
Patents, trademarks and licenses	5 to 10
Customer relations	3 to 30

Property, plant and equipment
The entire property, plant and equipment is used for business purposes and is measured at cost less depreciation for wear and tear. Depreciation on property, plant and equipment is recorded on the basis of the straight-line method in accordance with its utilization and allocated to the function costs. Throughout the consolidated group, systematic depreciation is based on the following useful lives:

	in years
Buildings	9 to 33
Technical equipment and machines	2 to 14
Other equipment, factory and office equipment	2 to 13

The depreciation on machines used in multi-shift operations is increased accordingly by shift allowances.

The residual values, depreciation methods and useful lives of assets are reviewed annually and adapted, if necessary.

Right-of-use assets are capitalized and a corresponding lease liability is recognized at the inception of a lease in which ZF acts as the lessee. The lease liability is recognized at the present value of the future lease payments and discounted using the interest rate implicit in the lease. Normally, this rate cannot be readily determined. In these cases, ZF's incremental borrowing rate for matching maturities and currencies is used. This rate is derived from observable credit spreads and swap rates. Lease liabilities are measured at the updated carrying amount using the effective interest method.

Amounts that are expected to be paid due to a residual value guarantee as well as extension, termination and purchase options – to the extent reasonably certain – are taken into account in the measurement of future payments.

In addition to the present value of the future lease payments, the cost of the right-of-use asset is determined by taking into account any payments made before the commencement date, lease incentives and initial direct costs, if applicable. Furthermore, the estimated costs for retirement obligations assumed are included in the measurement. The capitalized right-of-use assets are depreciated on a straight-line basis over the shorter of the lease term or the expected useful life. By exercising the corresponding option, agreements with a term of up to one year and agreements regarding assets that can be used independently and are of low value are recognized directly in profit or loss, not affecting the statement of financial position. ZF does not apply IFRS 16 to transactions involving intangible assets (including software and licenses). These are accounted for in accordance with IAS 38.

The capitalized right-of-use assets are reported in the statement of financial position as a part of property, plant and equipment in the respective asset classes to which the asset underlying the lease is to be allocated. Lease liabilities are included in the line item "Financial liabilities". The interest expense is part of the net financial result.

Government grants

Government grants are recognized only if there is reliable evidence that the related conditions are met and the subsidies are likely to be granted. Investment subsidies are deducted from property, plant and equipment in the period in which they were received. Expense subsidies are recognized as income during the same period in which the expenses, for which compensation was granted, are incurred. This does not include reimbursements for employer contributions to social security in the context of short-time work. These are offset against the personnel expenses.

Current market interest rates are used for the valuation of non-interest-bearing or low-interest-bearing government loans. The difference between the discounted value and the repayment value is deferred and recognized under other liabilities. The deferred amount is broken down over the duration of the loan contract and recognized in interest expenses.

Assets held for sale and disposal groups

Assets and liabilities are reported as disposal groups when these are to be disposed of by sale together as a group in a single transaction which is highly probable. Individual assets are reported in the statement of financial position as assets held for sale. The affected assets and liabilities are presented separately in the statement of financial position in current assets and liabilities as "Assets held for sale and disposal groups" and "Liabilities of disposal groups", respectively. Income and expenses of the assets and liabilities affected are included in the profit or loss from continuing operations until disposal.

The disposal group is measured upon initial recognition in accordance with the relevant IFRS standards. Subsequently, the disposal group is measured at the lower of its carrying amount or fair value less costs to sell.

Impairment tests

For investments in associates, intangible assets already in use as well as property, plant and equipment, it is verified as of the reporting date whether there are indications of potential impairment. If there are any indications, an impairment test must be performed. Intangible assets that are not yet ready to be used are subject to an annual impairment test.

To perform the impairment test, the recoverable amount is determined. This is the higher amount of the asset's or the smallest cash-generating unit's fair value less costs to sell and their value in use. The recoverable amount is determined for the individual asset or a cash-generating unit, if no cash flows can be allocated to the individual asset. The cash-generating units underlying the impairment tests are defined on the basis of the Group's business units or the regional organization of the Group. The Group's business units also represent the organizational level which is subject to regular review by management.

The value in use is the net present value of future cash flows, which are expected from the continued use of the asset (or the cash-generating unit) and its disposal at the end of its useful life. Based on an upstream strategic planning with a seven-year planning horizon and downstream one-year budget planning, this extended projection period formed the basis for determining the value in use according to the discounted cash flow method. The extended planning horizon is better suited to reflect the long-term development of ZF's business and its strategic prospects against the backdrop of the transformational changes in the automotive industry – which require longer projection periods, in particular for research and development as well as investment planning – and the longer product life cycles, especially in the truck sector. The capital cost rates of the consolidated ZF Group, which are determined on the basis of the WACC (Weighted Average Cost of Capital) method, are used to discount the cash flows.

The forecast for cash flows is based on the current operational and strategic planning of the consolidated ZF Group, in which general economic data from external macroeconomic research as well as financial surveys is also taken into consideration. The assumptions made consider the country-specific rates of inflation for the period investigated. Cost of materials is forecast based on the individual premises at the level of each cash-generating unit. The development of personnel expenses is also forecast individually on the basis of the collective agreements in effect.

Based on these cash flow predictions, the value in use of the cash-generating units is determined assuming a discount factor before tax of 12% (2021: 10%) and a growth rate of 1% (2021: 1%). For perpetuity going beyond the planning horizon, the cash flows are extrapolated taking into account the respective sustainable expected margin of the individual cash-generating units.

Fair values less costs to sell for property, plant and equipment are estimated on the basis of discounted cash flows as well as a cost-based approach for comparable assets that are generally not based on parameters observable on the market.

An impairment loss is recognized if the recoverable amount falls below the carrying amount of the asset or the cash-generating unit.

If the reason for an impairment loss recognized in an earlier period ceases to exist, the impairment loss is reversed, however up to a maximum of the carrying amount that would have been determined (net of depreciation or amortization) if no impairment loss had been recognized. Impairment losses and reversals of impairment losses for intangible assets and property, plant and equipment are assigned to the functional areas of the consolidated statement of profit or loss.

Goodwill from business combinations is allocated to those groups of cash-generating units that derive benefit from the business combinations. In the consolidated ZF Group, these are the respective divisions. An impairment test for goodwill is performed annually using the impairment test in accordance with the above-described methods. An impairment of goodwill is recognized if the recoverable amount of the corresponding cash-generating unit is below its carrying amount. Impairment losses for goodwill are reported under other expenses. Impairment losses recognized on goodwill are not reversed.

Financial liabilities and other liabilities

If financial liabilities are held for trading, the related changes in fair value are recognized through profit or loss (FVtPL). Both initial measurement and subsequent measurement are based on fair value.

Financial liabilities not held for trading are measured at amortized cost (AC) (if they do not fall within a special category). The initial measurement is based on fair value less transaction costs, while subsequent measurement is based on amortized cost. This measurement category primarily comprises financial debt and trade payables.

Alternatively, to avoid mismatches in terms of recognition or measurement, the liabilities may also be measured at fair value through profit or loss (FVtPL). The consolidated ZF Group dispenses with applying the fair value option.

Reverse factoring agreements were concluded for part of the trade payables. These agreements did not lead to any substantial modifications to the terms of the contract, which is why they are still disclosed under trade payables.

Contract liabilities

Contract liabilities comprise prepayments from customers received for goods or services that are yet to be delivered or provided by ZF. In addition, outstanding charges by the customer to ZF or credits not yet granted by ZF to the customer are reported in this item.

Provisions for pensions

Provisions for pensions are recognized in accordance with the projected unit credit method. Under this method, not only pensions and vested interests recognized as of the reporting date are taken into account, but also increases in pensions and current salaries and wages that are expected in the future. The calculation is based on actuarial reports, taking into account biometric calculation bases. The plan assets which are solely used for satisfying the pension obligations and which are restricted from the access of all other creditors are offset against provisions. If these exceed the amount of provisions, such excess is reported under non-current financial assets. The plan assets are recognized at fair value. Expenses resulting from unwinding the discount on pension obligations and expected returns on plan assets are offset and recognized in interest expenses. Actuarial gains and losses are recognized in full in other comprehensive income in the period in which they occur. All other expenses resulting from the addition to pension provisions are assigned to the affected functional areas within the consolidated statement of profit or loss.

Other provisions

Other provisions are recognized if an obligation to third parties exists, which will probably result in the outflow of resources, and if a reliable estimate can be made of the amount required.

As a general rule, all cost elements that are capitalized in inventories are reflected in the measurement of provisions relating to sales, in particular those for warranties and potential losses on pending transactions. The measurement takes place at the value of the best possible estimate of expenses which are necessary to fulfill the obligation on the reporting date. The measurement of provisions for warranty costs takes place on the basis of actual warranty expenses under consideration of warranty and goodwill periods as well as sales development over several years.

Personnel-related obligations mainly relate to semi-retirement obligations, obligations in connection with restructuring measures as well as long-service awards. The provisions for semi-retirement obligations comprise individual or pay-scale-related top-up benefits for pension insurance as well as the wages and salaries to be paid until the end of the release phase. They are accrued on a pro-rata basis when the obligation arises and according to the respective nature of the commitment, taking into account a minimum period of employment.

The major portion of the semi-retirement obligations is protected against insolvency using a trust model. The assets, which are solely used for satisfying the semi-retirement obligations and which are restricted from the access of all other creditors, are offset against provisions (plan assets). They are recognized at fair value. If the plan assets exceed the amount of provisions, such excess is reported under non-current financial assets. The return on plan assets is offset against expenses from the interest cost of provisions and reported in the statement of profit or loss together with interest.

Provisions for restructuring measures are recorded as soon as a formal plan exists and has been communicated to the parties affected or when the implementation of the plan has started. In addition to the scope of the planned capacity adjustments, country- and location-specific regulations as well as the corresponding remuneration level are also taken into account in the evaluation.

Provisions for employee long-service bonuses are calculated on an actuarial basis.

Current provisions are expected to be utilized in the course of the following fiscal year. Non-current provisions with a residual term of more than one year are recognized at the reporting date with their discounted settlement amount. They are discounted when the effect of the time value of money is material.

Income taxes

The current income tax receivables and provisions for current and previous periods, which also include tax risks, are measured using the amount for which reimbursement from or payment to tax authorities is expected. The amount is calculated using the tax rates and the tax laws that are in effect on the reporting date.

Deferred tax assets and liabilities are recognized via temporary differences between the tax basis and the IFRS carrying amounts. Deferred tax assets also include tax reductions that will result from the expected utilization of existing tax loss carryforwards and tax credits in the subsequent years. Deferred taxes are computed on the basis of the tax rates that will or are expected to apply on the realization date with sufficient probability in accordance with the current legal situation in the individual countries.

Deferred tax assets on temporary differences and on tax loss carryforwards are only recognized if there is sufficient probability that the tax reductions resulting from them will actually occur in future.

The carrying amount of deferred tax assets is reviewed on each reporting date and written down accordingly, if it is anticipated that there will not be enough taxable profit to offset the tax assets at least in part. Unrecognized deferred tax assets are reviewed on each reporting date and recognized to the extent that a future taxable income allows the utilization of deferred tax assets.

In addition, no deferred tax assets and liabilities are recognized if these result from the initial recognition of goodwill, an asset or a liability as part of a business transaction which is not a business combination, and if, through this initial recognition, neither the accounting net profit or loss before income tax nor the taxable profit is influenced.

Deferred taxes that refer to line items that are directly recognized in equity are also recognized in equity and not in the consolidated statement of profit or loss.

Deferred tax receivables and deferred tax liabilities are offset against each other if the consolidated group has a recoverable right to offsetting the current tax refunds against current tax liabilities and if they apply to the income taxes of the same tax subject levied by the same tax authority.

Judgments and uncertainties in connection with estimates

Preparation of the consolidated financial statements requires assumptions to be made and estimates to be applied, which affect the reported amounts and disclosure of assets and liabilities, income and expenses as well as contingent liabilities.

Essential assumptions and estimates as used in the recognition and measurement of the balance sheet items are explained below.

ZF recognizes sales (Note 1) from a transaction with a customer at the date when ZF has satisfied its performance obligation and control over the product or the service is transferred to the customer. For the major part of the transactions, the transfer of control occurs on the basis of the terms of delivery agreed with the customer (Incoterms). The most commonly used Incoterms are "Ex Works" and "Free Carrier" (FCA). After the transfer of control, the payment for the items delivered or services rendered is made based on terms of payment that are common in the industry and dependent on the individual creditworthiness of the customer. To the extent that warranties with service characteristics are provided to customers that extend beyond typical warranty agreements, sales are recognized over the agreed service period.

In the case of sales not related to volume production, ZF partially receives prior to or concurrently with service provision advance payments in relation to the services to be provided. The transaction price underlying revenue recognition is measured on the basis of the payment claim contractually agreed at the date of the transaction. Any existing variable price components, such as price reductions linked to meeting specific quantity targets or to the development of material prices or exchange rates, are reviewed periodically as to their feasibility.

Contract assets (Note 12) are amortized depending on the project term and unit prices. They are reviewed regularly as to their feasibility based on orders received and sales expectations. If there are any indications that a contract asset is not recoverable, a loss allowance is recognized in the corresponding amount.

Management estimates as to technical and economic feasibility of development projects influence the decision to capitalize development costs under intangible assets (Note 16). The measurement of the capitalized development costs depends on the assumptions about the amount and timing of expected future cash flows as well as on the discount rates to be applied.

For the accounting of other intangible assets (Note 16) and property, plant and equipment (Note 17), the assumptions and estimates essentially relate to the definition of useful lives.

Extension, termination and purchase options have to be taken into account in the recognition of right-of-use assets from leases (Note 18) as well as lease liabilities to the extent that it is reasonably certain that such options are exercised. Reasonably probable extension and purchase options lead to an increase of future payments and thus to higher right-of-use assets and, accordingly, to higher future depreciation. In contrast, reasonably probable termination options result in a decrease of the recognized right-of-use assets and to lower future depreciation. In particular, real estate rental contracts may include such options, and the exercise of such options is reviewed regularly taking into account economic aspects.

Measurement as well as the determination of the useful lives of assets, liabilities and contingent liabilities to be recognized in the context of acquisitions were primarily made using cash-flow-based estimates. The allocation of purchased goodwill was subject to estimates as regards the amount and the timing of future cash flows resulting from synergies.

In the context of the impairment tests (Note 19), assumptions and estimates are used in determining the future cash flows to be expected as well as for defining discount rates. This may have an influence on the values of intangible assets in particular.

The assessment of the recoverability of trade receivables (Note 11) is subject to judgment as regards the expected probability of default.

In accounting the deferred tax assets (Note 8), the assumptions and estimates essentially relate to the likelihood of expected tax reductions actually occurring in the future.

The determination of income tax assets and liabilities (Note 8) is subject to assumptions and estimates relating to the tax assessment of circumstances. Within the scope of current or future audits, tax laws and relevant facts or circumstances could be interpreted and assessed in a different manner by tax authorities than by ZF.

When determining the outstanding customer charges or credits to the customer as part of contract liabilities (Note 21) in the consolidated financial statements in connection with differences in prices or quantities, assumptions and estimates were made based on ongoing customer negotiations or past experience with customers.

The actuarial measurement of provisions for pensions (Note 24) requires several assumptions depending on the nature of the commitment. The assumptions regarding discount rates, future pension and salary increases as well as demographic developments have a major influence on the valuation. In addition to the aforementioned assumptions, the amount of deferred remuneration by the participating employees as well as their future selection with regard to payment options is also an essential estimate for the measurement of the capital-related defined benefit obligations in Germany.

Determination of warranty provisions (Note 23) is subject to assumptions and estimates which refer to the time period between delivery date and the occurrence of the warranty event, warranty and goodwill periods as well as future warranty burdens.

The determination of provisions for onerous contracts (Note 23) is subject to judgments with respect to the interpretation of supply contracts. In this respect, the major decision criteria are the bindingly defined term of delivery as well as quantities and prices.

The measurement of the restructuring provisions (Note 23) depends to a great extent on the expected corporate development and implementation of the initiated cost reduction and structural adjustment measures.

ZF Friedrichshafen AG and its subsidiaries are exposed to various claims arising from legal disputes (Note 34), in particular in connection with warranty cases as well as antitrust proceedings and investigations by authorities. Against the backdrop of complex legal matters, the assessment of the outcome of the proceedings is subject to discretion. The probability and the amount of utilization is taken into account when recognizing provisions. The assessment is based on internal estimates, supported by external consultants and lawyers in individual cases. These estimates will be adjusted if new insights and changes in circumstances occur, and they may deviate significantly from the actual outcome of the proceedings.

The worldwide consequences of global warming include more severe or frequent weather extremes such as floods, storms and droughts. These climate-related risks as well as the related legislation are continuously monitored as part of the preparation of the consolidated financial statements. Resulting effects (e.g., decisions about company locations, further development of the product portfolio, useful life of non-current assets) are taken into account in strategic planning. In the current fiscal year, there were no effects on the accounting and measurement of assets and liabilities.

Regarding contracts to buy or sell non-financial items, it is subject to judgment whether ZF has entered into them and continues to hold them for the purpose of the receipt or delivery of a non-financial item in accordance with the expected purchasing, sale or usage requirements, which would put them outside the scope of IFRS 9.

No other major judgments were made.

In individual cases, actual amounts could differ from these assumptions and estimates. Changes are recognized in profit or loss as soon as better information is available. This could have an impact on the Group's future net assets, financial position and results of operations.

NOTES TO THE CONSOLIDATED STATEMENT OF PROFIT OR LOSS

The consolidated statement of profit or loss has been drawn up in accordance with the cost of sales method.

1 Sales

In the following tables, the sales based on contracts with customers are broken down into sales categories and geographical regions:

in € million	2022	2021
Volume production business sales	37,292	32,606
Aftermarket and service sales	4,484	4,176
Other sales	2,025	1,531
	43,801	**38,313**

in € million	2022	2021
Germany	8,213	7,409
Western Europe	7,685	6,893
Eastern Europe	2,819	2,995
North America	12,487	10,194
South America	1,432	1,054
Asia-Pacific	10,689	9,395
Africa	476	373
	43,801	**38,313**

2 Cost of sales

in € million	2022	2021
Cost of materials	28,507	23,907
Personnel expenses	5,084	4,832
Depreciation, amortization and impairment	1,589	1,525
Other	1,724	1,515
	36,904	**31,779**

3 Other operating income

in € million	2022	2021
Foreign exchange gains	434	282
Income from hedging	86	79
Income from the disposal of intangible assets and property, plant and equipment	22	47
Income from deconsolidations	103	1
Others	183	175
	828	**584**

4 Other operating expenses

in € million	2022	2021
Foreign exchange losses	410	270
Expenses from hedging	109	59
Losses on the disposal of intangible assets and property, plant and equipment	7	43
Changes of allowances for receivables	29	–42
Expenses from deconsolidations	41	0
Others	100	60
	696	**390**

5 Net result from participations

in € million	2022	2021
Result from at-equity valuation	3	1
Result from disposal of associates	0	133
Valuation of associates	–21	86
Result from associates	**–18**	**220**
Income from participations	3	2
Result from disposal of participations	0	2
Valuation of participations	0	1
Other net result from participations	**3**	**5**
Net result from participations	**–15**	**225**

6 Financial income

in € million	2022	2021
Interest from financial assets	22	12
Other interest	53	83
Return on plan assets	0	22
Income from derivative financial instruments	8	0
Interest income	**83**	**117**
Foreign exchange gains	890	264
Income from derivative financial instruments	169	143
Income from securities	5	10
Others	0	2
Other financial income	**1,064**	**419**
Financial income	**1,147**	**536**

Interest income under the effective interest method accounts for €55 million for the 2022 fiscal year (2021: €20 million).

7 Financial expenses

in € million	2022	2021
Interest from financial liabilities	320	319
Interest on lease liabilities	30	27
Other interest	18	32
Interest cost on pension provisions	56	41
Unwinding the discount on other non-current items	21	1
Interest expenses	**445**	**420**
Foreign exchange losses	816	296
Expenses from derivative financial instruments	274	113
Expenses from securities	4	0
Valuation of financial receivables	23	8
Expenses from financial guarantees	105	0
Transaction costs and incidental expenses	27	38
Other financial expenses	**1,249**	**455**
Financial expenses	**1,694**	**875**

8 Income taxes

Income taxes are composed as follows:

in € million	2022	2021
Current taxes	406	389
Deferred taxes	–220	–90
Income tax expense	**186**	**299**

Current income tax expenses included adjustments in the amount of –€42 million (2021: –€5 million) for current taxes of prior fiscal years. Deferred tax income includes tax income of approximately €171 million (2021: €91 million) in connection with the development of temporary differences.

The current taxes in Germany were determined on the basis of an overall tax rate of 30%, derived from the corporate income tax rate of 15%, the solidarity surcharge of 5.5% and an average trade tax rate of 14.175%. The current taxes of international subsidiaries are determined on the basis of relevant national tax laws and the tax rate applicable in the country of incorporation. Deferred tax assets and liabilities are measured at the tax rates in Germany and abroad, respectively, which are expected to apply at the time of realizing the asset or discharging the liability.

The (current and deferred) income tax expenses expected on the basis of the German overall tax rate of 30% (2021: 30%) deviate from the reported income tax expenses as set out below:

in € million	2022	2021
Expected income tax expenses	169	325
Increase/decrease of income taxes due to		
Tax effects due to different national tax rates and taxation systems	–71	–69
Effects of changes in tax laws	1	–22
Tax effects due to non-recognition and write-down of deferred tax assets and their reversal	54	24
Tax effects due to permanent differences [1]	6	85
Tax effects due to prior-period items	22	–37
Other	5	–7
Reported income tax expense	**186**	**299**

1) Permanent differences comprise tax-reducing items such as tax credits as well as non-deductible operating expenses and withholding taxes.

The gross amounts of deferred tax assets and liabilities resulted from the following line items:

in € million	2022 Deferred tax assets	2022 Deferred tax liabilities	2021 Deferred tax assets	2021 Deferred tax liabilities
Intangible assets	0	859	0	1,000
Other assets	338	285	181	271
Pensions	511	0	1,027	0
Other liabilities	535	231	588	159
Tax loss carryforwards and tax credits	331	0	307	0
Total	**1,715**	**1,375**	**2,103**	**1,430**
Netting	–748	–748	–744	–744
	967	**627**	**1,359**	**686**

The change in deferred taxes results not only from income taxes recognized in the consolidated statement of profit or loss but also from changes in line items of the consolidated statement of comprehensive income and from foreign currency effects.

For companies that showed a negative tax result in the year under review or in the previous year, a deferred tax asset arising from temporary differences and tax losses of €324 million (2021: €748 million) was capitalized because the realization of the tax claim is probable in this respect due to the tax profit planning. Tax profit planning in particular considers geopolitical effects as well as measures planned or already implemented.

At the end of the fiscal year, tax loss carryforwards are reported which were subject to offsetting restrictions. To that extent, no deferred tax assets have been recognized for these since their utilization due to future positive taxable profit is not probable.

No deferred tax assets were recorded for the following items (gross amounts):

in € million	2022	2021
Deductible temporary differences	627	399
Tax loss carryforwards and tax credits	1,261	989
	1,888	**1,388**

Of the unrecognized tax loss carryforwards, €769 million (2021: €547 million) had a limited expiration period of up to 20 years and €492 million (2021: €442 million) were unlimited. Other items in the amount of €233 million (2021: €246 million) were not taken into account because the probability of a claim is deemed to be extremely low.

Deferred taxes are to be recognized for temporary differences in relation to subsidiaries if their realization is probable. Deferred tax liabilities of €186 million (2021: €159 million) were recorded for reserves generated by subsidiaries. Apart from that, no deferred taxes have been recognized for the reserves generated by subsidiaries of €2,065 million (2021: €2,335 million), as the profits are to be reinvested for an indefinite period of time.

9 Other notes to the consolidated statement of profit or loss

The consolidated statement of profit or loss includes the following cost of materials:

in € million	2022	2021
Cost of raw materials, supplies and merchandise	28,518	23,916
Cost of purchased services	321	287
Other cost of materials	35	29
	28,874	**24,232**

The breakdown of personnel expenses is as follows:

in € million	2022	2021
Wages and salaries	7,214	6,746
Social security and benefit expenses	1,373	1,290
Pension expenses	265	350
	8,852	**8,386**

Personnel expenses include expenses for defined contribution plans in the amount of €362 million (2021: €363 million). The expenses contained for the state plans amounting to €322 million (2021: €310 million) primarily comprise the employer's contribution to the state pension scheme, which is included in the social security expenses.

Amortization on intangible assets and property, plant and equipment is included in the following consolidated statement of profit or loss items:

	Intangible assets		Property, plant and equipment	
in € million	2022	2021	2022	2021
Cost of sales	254	235	1,326	1,290
Research and development costs	42	43	118	111
Selling expenses	383	361	23	24
General administrative expenses	23	24	140	137
	702	**663**	**1,607**	**1,562**

Research and development costs recorded in the fiscal year reached €2,790 million (2021: €2,596 million). This figure includes amortization for capitalized development costs of €22 million (2021: €22 million).

NOTES TO THE CONSOLIDATED STATEMENT OF FINANCIAL POSITION

10 Financial assets

	Dec. 31, 2022		Dec. 31, 2021	
in € million	Total	Thereof current	Total	Thereof current
Investments in participations	111	0	77	0
Securities	58	24	92	63
Financial receivables	160	57	134	32
Net assets from defined benefit plans	292	0	759	0
Derivative financial instruments	125	75	56	53
	746	**156**	**1,118**	**148**

Investments in participations have developed as follows:

in € million	2022	2021
Carrying amount as of Jan. 1	77	62
Changes in the basis of consolidation	0	−14
Net exchange differences	−1	0
Changes not affecting profit and loss	21	0
Additions	14	28
Reclassifications	0	2
Disposals	0	−2
Depreciation, amortization and impairment	0	−3
Reversals of impairments	0	4
Carrying amount as of Dec. 31	**111**	**77**

The financial receivables include granted loans and direct insurance claims against life insurances of €30 million (2021: €33 million). The financial receivables also contain earmarked bank deposits and time deposit investments of €57 million (2021: €55 million).

The specific loss allowances for financial receivables have developed as follows:

in € million	2022	2021
Carrying amount as of Jan. 1	51	112
Net exchange differences	0	1
Additions	17	8
Utilization	–3	–70
Carrying amount as of Dec. 31	**65**	**51**

The credit-based loss allowances for financial receivables remained unchanged at €1 million.

11 Trade receivables

The trade receivables have the following risk structure:

Dec. 31, 2022 Risk category	Net in € million	Risk structure in %	Specific loss allowances in € million	Credit-based loss allowances in € million	Gross in € million
1	636	11	8	1	645
2	4,612	77	34	38	4,684
3	704	12	45	31	780
4	15	0	12	0	27
Total	**5,967**	**100**	**99**	**70**	**6,136**

Dec. 31, 2021 Risk category	Net in € million	Risk structure in %	Specific loss allowances in € million	Credit-based loss allowances in € million	Gross in € million
1	475	9	4	1	480
2	4,457	79	28	49	4,534
3	662	12	12	32	706
4	23	0	16	1	40
Total	**5,617**	**100**	**60**	**83**	**5,760**

The specific loss allowances for trade receivables have developed as follows:

in € million	2022	2021
Carrying amount as of Jan. 1	60	75
Net exchange differences	2	7
Additions	54	14
Utilization	–3	0
Reversals	–14	–36
Carrying amount as of Dec. 31	**99**	**60**

The credit-based loss allowances for trade receivables have developed as follows:

in € million	2022	2021
Carrying amount as of Jan. 1	83	106
Net exchange differences	1	0
Net reversals	–14	–23
Carrying amount as of Dec. 31	**70**	**83**

Net reversals for credit-based loss allowances are mainly due to an adjustment of the expected probability of default.

12 Contract assets

in € million	Dec. 31, 2022 Total	Dec. 31, 2022 Thereof current	Dec. 31, 2021 Total	Dec. 31, 2021 Thereof current
Volume production business	670	353	413	172
Product development and application	169	55	169	55
Others	13	13	8	8
	852	**421**	**590**	**235**

Sales recorded in fiscal year 2022 from performance obligations satisfied (or partially satisfied) in previous fiscal years amount to €79 million (2021: €85 million).

Contract assets have developed as follows:

in € million	2022	2021
Carrying amount as of Jan. 1	590	422
Net exchange differences	4	6
Additions	623	307
Utilization	−355	−145
Reversals	−10	0
Carrying amount as of Dec. 31	**852**	**590**

The credit-based loss allowances for contract assets remained unchanged at €2 million.

The contract assets have the following risk structure:

Dec. 31, 2022 Risk category	Net in € million	Risk structure in %	Specific loss allowances in € million	Credit-based loss allowances in € million	Gross in € million
1	720	85	0	2	722
2	100	12	0	0	100
3	4	0	0	0	4
4	28	3	0	0	28
Total	**852**	**100**	**0**	**2**	**854**

Dec. 31, 2021 Risk category	Net in € million	Risk structure in %	Specific loss allowances in € million	Credit-based loss allowances in € million	Gross in € million
1	452	76	0	2	454
2	133	23	0	0	133
3	3	1	0	0	3
4	2	0	0	0	2
Total	**590**	**100**	**0**	**2**	**592**

13 Other assets

in € million	Dec. 31, 2022 Total	Dec. 31, 2022 Thereof current	Dec. 31, 2021 Total	Dec. 31, 2021 Thereof current
Other tax receivables	658	548	609	506
Prepaid expenses	171	124	162	110
Others	295	175	259	151
	1,124	**847**	**1,030**	**767**

Other tax receivables are, for the most part, sales tax refund entitlements. Others comprise, in general, payments in advance and capitalized reimbursement claims against suppliers.

The specific loss allowances for other assets amount to €15 million (2021: €16 million).

The credit-based loss allowances for other assets remained unchanged at €1 million.

14 Inventories

in € million	Dec. 31, 2022	Dec. 31, 2021
Raw materials and supplies	2,588	2,187
Work in progress	1,888	1,655
Finished goods and merchandise	1,105	1,128
Payments in advance	16	23
	5,597	**4,993**

Compared to the previous year, write-downs of inventories increased by €25 million to €274 million.

15 Associates

in € million	Dec. 31, 2022	Dec. 31, 2021
Investments in joint ventures	41	72
Investments in associates	75	127
	116	**199**

The joint ventures and associates, including the shareholding, are set out in the list of shares held.

ZF PWK Mécacentre S.A.S., Saint-Etienne (France), is classified as an associate despite a participation quota of 50% as the company is not jointly controlled.

The total comprehensive income of the associates is as follows:

	Investments in joint ventures		Investments in associates	
in € million	2022	2021	2022	2021
Net profit or loss after tax	7	22	–25	198
Other comprehensive income	0	0	–2	0
Total comprehensive income	**7**	**22**	**–27**	**198**

Net profit or loss after tax includes impairments on investments in associates amounting to €21 million.

16 Intangible assets

in € million	Goodwill	Patents, licenses, software and similar rights and assets	Development costs	Payments in advance	Total
Cost as of Jan. 1, 2022	**8,095**	**8,112**	**256**	**67**	**16,530**
Changes in the basis of consolidation	−20	6	0	0	−14
Net exchange differences	198	299	11	0	508
Additions	0	31	33	17	81
Reclassifications	0	2	0	−2	0
Disposals	−5	−37	0	−2	−44
Reclass disposal groups	−20	−6	0	0	−26
Cost as of Dec. 31, 2022	**8,248**	**8,407**	**300**	**80**	**17,035**
Accumulated amortization as of Jan. 1, 2022	**73**	**3,537**	**152**	**0**	**3,762**
Net exchange differences	0	187	8	0	195
Additions (amortization)	0	680	22	0	702
Additions (impairments)	0	16	0	0	16
Disposals	0	−35	0	0	−35
Reclass disposal groups	0	−1	0	0	−1
Accumulated amortization as of Dec. 31, 2022	**73**	**4,384**	**182**	**0**	**4,639**
Carrying amount as of Dec. 31, 2022	**8,175**	**4,023**	**118**	**80**	**12,396**

in € million	Goodwill	Patents, licenses, software and similar rights and assets	Development costs	Payments in advance	Total
Cost as of Jan. 1, 2021	**7,631**	**7,731**	**211**	**67**	**15,640**
Changes in the basis of consolidation	169	0	0	0	169
Net exchange differences	305	383	21	0	709
Additions	0	49	24	9	82
Reclassifications	0	8	0	−8	**0**
Disposals	0	−56	0	−1	−57
Reclass disposal groups	−10	−3	0	0	**−13**
Cost as of Dec. 31, 2021	**8,095**	**8,112**	**256**	**67**	**16,530**
Accumulated amortization as of Jan. 1, 2021	**73**	**2,711**	**121**	**0**	**2,905**
Net exchange differences	0	241	9	0	250
Additions (amortization)	0	641	22	0	663
Disposals	0	−53	0	0	−53
Reclass disposal groups	0	−3	0	0	**−3**
Accumulated amortization as of Dec. 31, 2021	**73**	**3,537**	**152**	**0**	**3,762**
Carrying amount as of Dec. 31, 2021	**8,022**	**4,575**	**104**	**67**	**12,768**

Goodwill

Accordingly, goodwill from the consolidation of investments in subsidiaries and from the individual financial statements is shown below:

in € million	Dec. 31, 2022	Dec. 31, 2021
Active Safety Systems	1,068	1,013
Car Chassis Technology	395	394
Electrified Powertrain Technology	909	929
Electronics and ADAS	57	57
Passive Safety Systems	1,135	1,085
Commercial Vehicle Solutions	3,828	3,783
Industrial Technology	234	234
Aftermarket	544	522
Central units	5	5
	8,175	**8,022**

Goodwill mainly represents synergies in the areas of materials purchasing, technology development and administrative company organization.

17 Property, plant and equipment

in € million	Land and buildings	Technical equipment and machines	Other equipment, factory and office equipment	Payments in advance and construction in progress	Total
Cost as of Jan. 1, 2022	**4,391**	**13,574**	**2,927**	**1,087**	**21,979**
Changes in the basis of consolidation	5	−34	−13	−11	−53
Net exchange differences	24	75	32	17	148
Additions	215	517	173	983	1,888
Reclassifications	81	594	52	−727	0
Disposals	−85	−408	−129	−1	−623
Reclass disposal groups	−2	−57	−26	−13	−98
Cost as of Dec. 31, 2022	**4,629**	**14,261**	**3,016**	**1,335**	**23,241**
Accumulated depreciation as of Jan. 1, 2022	**1,755**	**9,797**	**2,236**	**0**	**13,788**
Changes in the basis of consolidation	−6	−40	−9	0	−55
Net exchange differences	−2	31	23	0	52
Additions (amortization)	243	1,134	230	0	1,607
Additions (impairments)	0	9	1	0	10
Reclassifications	27	−27	0	0	0
Disposals	−46	−376	−123	0	−545
Reclass disposal groups	0	−47	−24	0	−71
Reversals of impairments	0	−1	0	0	−1
Accumulated depreciation as of Dec. 31, 2022	**1,971**	**10,480**	**2,334**	**0**	**14,785**
Carrying amount as of Dec. 31, 2022	**2,658**	**3,781**	**682**	**1,335**	**8,456**

in € million	Land and buildings	Technical equipment and machines	Other equipment, factory and office equipment	Payments in advance and construction in progress	Total
Cost as of Jan. 1, 2021	**4,170**	**12,355**	**2,806**	**1,063**	**20,394**
Changes in the basis of consolidation	36	56	6	1	99
Net exchange differences	90	336	54	44	524
Additions	136	573	164	732	1,605
Reclassifications	36	642	74	−752	0
Disposals	−61	−371	−166	−1	−599
Reclass disposal groups	−16	−17	−11	0	**−44**
Cost as of Dec. 31, 2021	**4,391**	**13,574**	**2,927**	**1,087**	**21,979**
Accumulated depreciation as of Jan. 1, 2021	**1,587**	**8,792**	**2,105**	**0**	**12,484**
Changes in the basis of consolidation	3	41	7	0	51
Net exchange differences	20	185	39	0	244
Additions (amortization)	227	1,104	231	0	1,562
Additions (impairments)	0	3	0	0	3
Reclassifications	−25	10	15	0	0
Disposals	−44	−322	−152	0	−518
Reclass disposal groups	−13	−14	−9	0	**−36**
Reversals of impairments	0	−2	0	0	−2
Accumulated depreciation as of Dec. 31, 2021	**1,755**	**9,797**	**2,236**	**0**	**13,788**
Carrying amount as of Dec. 31, 2021	**2,636**	**3,777**	**691**	**1,087**	**8,191**

18 Leases

The leased assets are primarily rented properties, leased motor vehicles and forklift trucks. The rights of use from leases reported in property, plant and equipment have the following additions and depreciations:

in € million Dec. 31, 2022	Land and buildings	Technical equipment and machines	Other equipment, factory and office equipment	Total
Additions during the fiscal year	136	2	45	183
Depreciations during the fiscal year	127	12	42	181
Carrying amount	**607**	**36**	**78**	**721**
Dec. 31, 2021				
Additions during the fiscal year	80	21	40	141
Depreciations during the fiscal year	119	12	40	171
Carrying amount	**613**	**48**	**77**	**738**

In fiscal year 2022, expenses for current leases amounted to €38 million (2021: €42 million) and expenses for leases of low-value assets were incurred in the amount of €19 million (2021: €14 million). Interest expenses for leases reported in the net financial result amounted to €30 million (2021: €27 million).

In the fiscal year, payments for lease liabilities in the amount of €175 million (2021: €169 million), including interest, were made.

The maturity structure of lease liabilities as of December 31, 2022, is as follows:

in € million	2022	2021
within the upcoming fiscal year	182	179
between 2 and 5 years	450	439
more than 5 years	291	302
	923	**920**

As of December 31, 2022, there are purchase commitments for short-term leases to the customary extent.

19 Impairment tests

In the fourth quarter of 2022, impairment tests were performed to assess the impairment of the assets.

Inter alia, assumptions were made with regard to the development of sales in order to calculate the impairment tests. The partial decrease in growth rates is mainly attributable to a lower sales level in the previous years due to the Covid-19 pandemic, the strain on the global economy caused by the Russia-Ukraine war and the resulting inflation and rising interest rates, and the progressing transformation process in the automotive industry.

The assumptions made for the average sales increase in the planning period are as follows:

in %	2022	2021
Active Safety Systems	6	10
Car Chassis Technology	7	5
Electrified Powertrain Technology	3	5
Electronics and ADAS	17	18
Passive Safety Systems	3	6
Commercial Vehicle Solutions	9	16
Industrial Technology	8	7
Aftermarket	9	4

As in the previous year, the annual impairment tests of goodwill did not lead to an impairment loss on goodwill.

In addition, a sensitivity analysis regarding material measurement parameters was conducted in the context of the impairment tests. This involved an analysis to what extent, if assessed on an isolated basis, a reduction of the sustainable operating profit by 10%, a reduction of the sustainable growth rate to 0.5% or an increase in the capitalization rate by 10% would affect the recoverability of goodwill.

A sustained decline in operating profit by 10% would result in an impairment of €439 million in the Commercial Vehicle Solutions Division. Furthermore, an increase in the capitalization interest rate of 10% would result in an impairment of €801 million. A sustained decrease of the growth rate to 0.5% would have resulted in an impairment of €244 million. An increase in the capitalization interest rate by 10% would result in an impairment of €88 million in the Active Safety Systems Division.

None of the scenarios considered within this sensitivity analysis would have led to an impairment of goodwill in any of the remaining divisions.

In addition, the Industrial Technology Division recorded impairments on intangible assets amounting to €16 million.

20 Financial liabilities

	Dec. 31, 2022		Dec. 31, 2021	
in € million	Total	Thereof current	Total	Thereof current
Bonds	7,826	1,668	7,745	83
Bonded loans	2,166	122	2,062	611
Liabilities to banks	2,099	172	1,878	181
Other financial liabilities	66	45	37	12
Lease liabilities	797	155	809	156
Derivative financial instruments	82	76	60	49
	13,036	**2,238**	**12,591**	**1,092**

Under current financial liabilities, non-current loans, bonded loans and bonds are recognized with their redemption installments due within one year. Moreover, current liabilities which serve short-term financing purposes are included under this item. The country-specific interest rates on these short-term loans fluctuate between 1.1% (2021: 1.1%) and 4.5% (2021: 2.9%). The country-specific interest rate on the loans reported in non-current financial liabilities is between 1.4% (2021: 0.3%) and 5.97% (2021: 4.8%). Most of the financial liabilities have a fixed interest rate. Most of the loans are due at the end of the contractual term.

The financing strategy in 2022 was characterized by the issuance of further sustainable financing instruments and planned redemptions in the amount of €604 million. In September 2022, a sustainable bonded loan with a nominal amount of €700 million was issued for the first time. The interest rate is linked to an ESG rating issued by the agency EcoVadis. Thus, ZF succeeded in taking a further step towards sustainable financing as part of the ZF Next Generation Mobility strategy with the objective of actively linking the sustainability strategy with the financing strategy. In addition, a loan of €250 million was borrowed from the European Investment Bank, of which an amount of €25 million remains outstanding for further drawings. As of the reporting date, a loan of €250 million provided by KfW also remained unused, as was the syndicated loan that was refinanced in July 2022 with an implemented ESG concept and a volume of €3.5 billion in the form of a revolving credit line.

Apart from other obligations, the loans mentioned above also include a financial covenant that ZF has to comply with. It is defined as the ratio of net debt to adjusted, consolidated EBITDA. This financial key figure is tested each quarter. As of December 31, 2022, the maximum value was 3.50 and will be reduced to 3.25 as of December 31, 2023. ZF met the requirement on all test dates in the past and on the reporting date.

21 Contract liabilities

	Dec. 31, 2022		Dec. 31, 2021	
in € million	Total	Thereof current	Total	Thereof current
Volume production business	1,000	979	968	940
Product development and application	965	579	1,061	546
Others	50	23	37	20
	2,015	**1,581**	**2,066**	**1,506**

Contract liabilities have developed as follows:

in € million	2022	2021
Carrying amount as of Jan. 1	2,066	1,741
Changes in the basis of consolidation	–3	2
Net exchange differences	5	52
Additions	1,297	1,298
Utilization	–1,178	–927
Reversals	–165	–100
Reclass disposal groups	–7	0
Carrying amount as of Dec. 31	**2,015**	**2,066**

The expected future sales from performance obligations not satisfied (or partially not satisfied) as of December 31, 2022, are as follows:

in € million	2022	2021
1 to 5 years	923	824
> 5 years	144	97
Carrying amount as of Dec. 31	**1,067**	**921**

The performance obligations not satisfied (or partially not satisfied) mainly refer to contracts with customers in connection with development orders as well as tools.

In the current fiscal year, there were changes in the timeframe, which had an effect amounting to €66 million (2021: €51 million) on the fulfillment of future performance obligations.

22 Other liabilities

	Dec. 31, 2022		Dec. 31, 2021	
in € million	Total	Thereof current	Total	Thereof current
Liabilities to employees	882	798	903	824
Social contributions	70	68	63	61
Other tax liabilities	301	301	332	332
Prepaid expenses	47	22	39	10
Others	616	572	704	610
	1,916	**1,761**	**2,041**	**1,837**

Other tax liabilities are mainly sales tax liabilities. Other liabilities include, among others, deferred liabilities from procurement and sales, for legal costs and costs of litigation, as well as liabilities for licenses and commissions.

23 Other provisions

in € million	Carrying amount Dec. 31, 2022 Total	Expected utilisation 2023	2024 to 2028	2029 and beyond
Obligation from sales	783	473	307	3
Obligation from personnel	491	168	284	39
Other obligations	332	208	97	27
	1,606	**849**	**688**	**69**

in € million	Carrying amount Dec. 31, 2021 Total	Expected utilisation 2022	2023 to 2027	2028 and beyond
Obligation from sales	939	586	339	14
Obligation from personnel	518	125	374	19
Other obligations	232	113	96	23
	1,689	**824**	**809**	**56**

in € million	Obligation from sales	Obligation from personnel	Other obligations	Total
Jan. 1, 2022	939	518	232	1,689
Changes in basis of consolidation	0	−1	0	−1
Net exchange differences	6	4	6	16
Addition	244	158	103	505
Reclassification	−64	−30	94	0
Utilization	−230	−169	−46	−445
Reversals	−106	−10	−57	−173
Netting of plan assets	0	21	0	21
Reclass disposal groups	−6	0	0	−6
Dec. 31, 2022	**783**	**491**	**332**	**1,606**

The provisions for obligations from sales primarily include provisions for warranty, product liability and punitive damages as well as for imminent losses from delivery obligations.

The obligations from personnel mainly affect provisions for restructuring measures as well as other obligations to employees. Furthermore, the surplus of liabilities due to semi-retirement obligations remaining after offsetting with plan assets is included.

The provisions for restructuring measures primarily concern expenses for severance payments that will be incurred as part of a long-term program for structural adjustment.

Other obligations include, among other things, provisions for litigation and other legal risks, environmental protection measures, other punitive damages as well as tax risks.

Expected reimbursements as of December 31, 2022 amount to €1 million (2021: €34 million), of which €1 million (2021: €34 million) was capitalized as assets.

24 Provisions for pensions

The provisions for pensions are broken down as follows:

2022 in € million	Present value of defined benefit plans					Financial assets	Provisions for pensions
	Unfunded	Funded	Total	Plan assets	Net value	Net assets	Net liability
Germany	954	4,554	5,508	−2,435	3,073	157	3,230
United States of America	2	0	2	0	2	0	2
United Kingdom	0	970	970	−1,081	−111	111	0
Other	148	136	284	−136	148	24	172
	1,104	**5,660**	**6,764**	**−3,652**	**3,112**	**292**	**3,404**
Obligations from medical care benefits	147	0	147	0	147	0	147
Balance sheet disclosure						**292**	**3,551**

2021 in € million	Present value of defined benefit plans					Financial assets	Provisions for pensions
	Unfunded	Funded	Total	Plan assets	Net value	Net assets	Net liability
Germany	1,525	6,308	7,833	−2,545	5,288	62	5,350
United States of America	2	315	317	−333	−16	18	2
United Kingdom	0	1,621	1,621	−2,276	−655	655	0
Other	122	203	325	−187	138	24	162
	1,649	**8,447**	**10,096**	**−5,341**	**4,755**	**759**	**5,514**
Obligations from medical care benefits	166	0	166	0	166	0	166
Balance sheet disclosure						**759**	**5,680**

The consolidated ZF Group offers various schemes for retirement and medical care benefits. The structure of those schemes depends on the legal, economic and tax situation in the respective countries. A distinction has to be made between defined contribution plans and defined benefit plans.

Under defined contribution plans, the consolidated ZF Group does not enter into any obligations apart from the payment of contributions into earmarked funds and private pension insurance carriers.

Under defined benefit plans, the obligation of the consolidated ZF Group consists of fulfilling promised benefits to current and former employees. There are both unfunded and funded pension systems. Provisions for defined benefit pension commitments are set up for obligations from vested benefits of entitled current and former employees of the consolidated ZF Group and their surviving dependents.

Description of plans

The following paragraphs describe the most significant pension and medical care plans of the consolidated ZF Group. The essential risks for the company lie with the actuarial parameters, particularly interest level and pension trend as well as the demographic developments and the development of the market value of plan assets.

Germany (GER)

In Germany, there is a variety of defined benefit obligations with different characteristics.

Until 1993, commitments were granted depending on length of service and remuneration. From 1997, so-called pension modules were promised to pay-scale employees; the amount depends on the pensionable income in relation to the social security contribution ceiling of the statutory pension insurance. Since 2005, the annually allocated pension modules have been decoupled from the social security contribution ceiling. Since then, the modules' amounts have been calculated on the basis of the remuneration, the length of service, the respective classification of the position within the company hierarchy and the employee's age.

A Group-internal contractual trust arrangement (CTA) was concluded in 2016 to hedge the above-mentioned direct defined benefit obligations, and assets were contributed to the CTA.

While the CTA was initially intended to hedge the grants made to executive managers, the group of beneficiaries was expanded in 2021 so that the obligations from all of the above-mentioned commitments involving different hierarchy levels are hedged. There are no legal or regulatory minimum funding requirements.

Within the scope of the acquisition of TRW, ZF also acquired unfunded defined benefit plans in Germany. The plan benefits depend upon salary, length of service and the cost of living index.

In the course of the acquisition of WABCO in 2020, obligations for existing pension commitments in Germany were adopted. These are unfunded and, in addition to pensions after entering retirement, also provide for benefits to surviving dependants as well as for early retirement and disability. The amount of the benefit depends on the pensionable remuneration at the start of retirement as well as the length of service in the company.

In the context of the "ZF Rente" pension scheme, employee-financed pension modules are awarded. Employees may defer between 1% and 5% of their pensionable remuneration, where deferring at least 1% is compulsory. There are two rates: The first rate includes a guaranteed interest rate of 3.5% for established employees before December 31, 2005. The second rate does not offer a guaranteed interest rate for new employees as of 2006. Up to and including the year 2016, this direct grant was made in form of a participation in a multi-employer plan that constitutes a defined benefit plan. Since 2017, the waiver amounts have been transferred as trust funds to a trustee established specifically for this purpose.

In 2019, employees that had not previously been covered were granted a defined benefit commitment as part of the realignment of company pension schemes. This commitment called "ZF Vorsorge" also requires a monthly employee contribution in the amount of at least 1% of the remuneration. Entitled employees are now able to pay monthly contributions into a funded benefit account from their pensionable remuneration by way of deferred remuneration. With this commitment, the employer also makes contributions depending on the level of the employees' contributions. The commitment includes a retirement benefit as well as risk-based benefits in the case of reduced earning capacity and death. The employees can choose between various payout options.

Both employer and employee contributions for this new company pension scheme are managed by a trust fund association, specifically founded for this purpose.

Employees who were already beneficiaries under the previous scheme were presented an offer to switch to the "ZF Vorsorge" scheme in 2020. Any previously vested benefit obligations are taken into account in the form of starting modules. In 2022, the employees of the former WABCO companies who were already beneficiaries under the previous scheme and who had no switch option in 2020 were offered access to the "ZF Vorsorge" scheme on the same terms. The past service costs resulting from the switch were directly recognized through profit or loss in 2022.

Upon the introduction of the "ZF Vorsorge" scheme, all benefit commitments in Germany were closed for new entrants, including both "ZF Rente" and the commitments of TRW and WABCO.

In the fiscal year 2022, the asset ceiling of €173 million is applied for the first time for a defined benefit obligation in Germany. The plan assets attributable to ZF from a pension fund are limited to the value of the guaranteed pension benefit.

United States of America (USA)

The various defined benefit plans existing in the USA are closed for new entrants. Any vesting of further entitlements is normally no longer possible. The plans are mainly funded and comply with the provisions of the U.S. Employee Retirement Income Security Act (ERISA). As of the end of 2022, the obligations and associated plan assets of the largest pension plan in the USA to date were transferred to a third party. The difference resulting from the fair value of plan assets and the obligation as of the date of transfer was recognized in profit or loss.

In addition, ZF finances several unfunded post-employment medical care plans. The plans are closed for new entrants. The level of the benefits and the contributions for pensioners differ depending on the location. The major risks for grants of medical care benefits are increasing medical care costs as well as a decreasing participation of the government in these costs. These plans are subject to risks typical for defined benefit grants, particularly the risk from changes in discount rates.

United Kingdom (UK)

In the United Kingdom, the consolidated ZF Group maintains funded defined pension plans that have been closed. These plans are maintained pursuant to legal provisions and are managed by trust companies. The financing is determined every three years by technical valuations in compliance with local provisions.

With the acquisition of WABCO in 2020, additional funded pension obligations were recognized in the United Kingdom. In addition to retirement pensions, these include benefits for surviving dependants as well as for cases of disability and death before the retirement age is reached.

Under these pension commitments, both employers and employees must make contributions to trust funds. The pension amount depends on the pensionable income as well as the period of employment. The employer guarantees a minimum pension.

Defined benefit pension plans

Provisions for pensions are recognized based on actuarial principles in accordance with the projected unit credit method. Determining these provisions requires estimates to be made. In addition to assumptions on life expectancy, fluctuation and expected salary increases, above all the discount rates have a material effect on the amount of the obligation.

Changes in actuarial assumptions, diverging estimates as regards the risk profile of pension obligations as well as deviations between the actual and the expected return on plan assets are recognized as actuarial gains or losses under other comprehensive income.

	2022			2021		
in %	GER	USA	GB	GER	USA	GB
Discount rate	3.7	4.9	4.8	1.2	2.9	2.0
Pension increases	2.1	–	2.3 –2.9	1.4	–	2.5 –3.1

The average maturity period of the defined benefit obligations is as follows:

	2022			2021		
in years	GER	USA	GB	GER	USA	GB
Average maturity	14	7	17	20	13	18

The measurement of direct defined benefit obligations from pension plans in Germany, where additional awards may still be earned, is, in part, not based on a uniform replacement interest rate but by applying a yield curve corresponding to the relevant term of the underlying future cash flows.

As part of the measurement of provisions for other pension plans in Germany, the replacement interest rate is determined on the basis of high-quality corporate bonds with a rating of AA (or equivalent) from at least one of the three big rating agencies and are extrapolated based on the yield curve of zero coupon government bonds.

Pension provisions are calculated using country-specific mortality tables which are updated annually, depending on the country involved. The following mortality tables were used as of December 31, 2022:

	2022	2021
GER	Heubeck 2018 G mortality tables	Heubeck 2018 G mortality tables
USA	Pri-2021 mortality tables split between indirect and direct employees	Pri-2021 mortality tables split between indirect and direct employees
GB	2018 VITA tables (averaged) with CMI 2021	2018 VITA tables (averaged) with CMI 2020

A discount as regards the probability of disability according to the Heubeck 2018 G mortality tables to measure pension obligations at Group companies in Germany was applied. The discount is determined on the basis of company-owned historical data.

The effects from the application of revised mortality tables on the present value of the defined benefit obligations are recognized in other comprehensive income as actuarial gains or losses from changes in demographic assumptions.

The development of pension provisions as well as the related plan assets is presented in the following table:

in € million	GER	USA	GB	Other	2022 Total
Present value of the defined benefit obligations as of Jan. 1	**7,833**	**317**	**1,621**	**325**	**10,096**
Current service costs	182	0	1	25	208
Past service costs	−32	0	0	0	−32
Interest expenses	82	5	29	11	127
Contributions by plan participants	104	0	0	1	105
Settlements	0	−268	0	−2	−270
Pension payments	−188	−9	−91	−23	−311
Actuarial gains (−) and losses (+) from the change in demographic assumptions	0	0	−32	0	−32
Actuarial gains (−) and losses (+) from the change in financial assumptions	−2,448	0	−543	−52	−3,043
Actuarial gains (−) and losses (+) due to experience adjustments	−9	−72	67	11	−3
Other changes	−16	0	0	−18	−34
Net exchange differences from plans abroad	0	29	−82	6	−47
Present value of the defined benefit obligations as of Dec. 31	**5,508**	**2**	**970**	**284**	**6,764**
Plan assets at fair value as of Jan. 1	**2,545**	**333**	**2,276**	**187**	**5,341**
Expected return on plan assets	26	7	40	3	76
Actuarial gains (+) and losses (−) from the change in plan assets	−177	−76	−1,027	−36	−1,316
Employer contributions to the plan assets	119	0	0	5	124
Employee contributions	104	0	0	1	105
Settlements	0	−282	0	0	−282
Pension benefits paid	−13	−9	−91	−7	−120
Other changes	4	0	0	−18	−14
Net exchange differences from plans abroad	0	27	−117	1	−89
Plan assets at fair value as of Dec. 31	**2,608**	**0**	**1,081**	**136**	**3,825**
Asset ceiling as of Jan. 1	**0**	**0**	**0**	**0**	**0**
Change in asset ceiling	−173	0	0	0	−173
Asset ceiling as of Dec. 31	**–173**	**0**	**0**	**0**	**–173**

in € million	GER	USA	GB	Other	2021 Total
Present value of the defined benefit obligations as of Jan. 1	**8,633**	**301**	**1,676**	**293**	**10,903**
Current service costs	262	1	3	24	290
Past service costs	0	0	0	−4	−4
Interest expenses	53	8	23	6	90
Contributions by plan participants	80	0	0	5	85
Settlements	0	−2	0	0	−2
Pension payments	−176	−11	−92	−20	−299
Actuarial gains (−) and losses (+) from the change in demographic assumptions	0	13	−1	0	12
Actuarial gains (−) and losses (+) from the change in financial assumptions	−790	−16	−78	−18	−902
Actuarial gains (−) and losses (+) due to experience adjustments	−170	0	−21	17	−174
Other changes	−59	0	0	0	−59
Net exchange differences from plans abroad	0	23	111	22	156
Present value of the defined benefit obligations as of Dec. 31	**7,833**	**317**	**1,621**	**325**	**10,096**
Plan assets at fair value as of Jan. 1	**2,231**	**314**	**2,200**	**166**	**4,911**
Expected return on plan assets	12	8	32	2	54
Actuarial gains (+) and losses (−) from the change in plan assets	220	−1	−14	−2	203
Employer contributions to the plan assets	23	0	0	2	25
Employee contributions	80	0	0	5	85
Settlements	0	0	0	−1	−1
Pension benefits paid	−9	−11	−92	−7	−119
Other changes	−12	0	0	0	−12
Net exchange differences from plans abroad	0	23	150	22	195
Plan assets at fair value as of Dec. 31	**2,545**	**333**	**2,276**	**187**	**5,341**

The items recognized in profit or loss in connection with pension obligations are composed of as follows:

in € million	GER	USA	GB	Other	2022 Total
Current service costs	182	0	1	25	208
Past service cost	−32	0	0	0	−32
Curtailments and settlements	0	14	0	0	14
Administration expenses	0	0	4	0	4
Unwinding the discount on net liabilities	56	−2	−11	8	51
	206	**12**	**−6**	**33**	**245**

in € million	GER	USA	GB	Other	2021 Total
Current service costs	262	1	3	24	290
Curtailments and settlements	0	0	0	−4	−4
Unwinding the discount on net liabilities	41	0	−9	4	36
	303	**1**	**−6**	**24**	**322**

All components of the pension expenses recognized in profit or loss, with the exception of the interest portion, are reported in the functional areas.

The actuarial gains amounting to €1,589 million (2021: €1,267 million) are recorded in other comprehensive income with no effect on profit or loss.

The plan assets consist of the following items:

in € million	2022	2021
Cash and cash equivalents	353	260
Securities		
Equity instruments	1,197	1,224
Debt instruments	1,908	3,226
Land and buildings	0	6
Derivative financial instruments	−16	0
Other	383	625
	3,825	**5,341**

Securities are measured at prices quoted on active markets. The "Other" item mainly includes securities covered by receivables (asset-backed securities).

Contributions to plan assets are expected to amount to €107 million (2021: €44 million) in the following year.

Pension payments for the next ten years are as follows:

in € million	2022	2021
within the upcoming fiscal year	357	376
between one to five years	1,385	1,416
after five up to ten years	1,879	1,854

The calculation presents the expected actual pension payments and not just the pension modules earned by employee service rendered as of the closing date, i.e., pension modules that are to be allocated in future are also considered. In addition, it was assumed that the number of active employees remains constant.

For the other calculation assumptions, the same parameters were used as for the determination of the defined benefit obligations.

The effect of a change in significant assumptions on the defined benefit obligations is shown in the following:

in € million	GER	USA	GB	Other	2022 Total
Discount rate					
−0.25%	+199	0	+34	+7	+240
+0.25%	−187	0	−32	−6	−225
Pension increases					
−0.25%	−72	0	0	−1	−73
+0.25%	+76	0	0	+1	+77
Life expectancy					
−1 year	−120	0	−27	−2	−149
+1 year	+134	0	+28	+2	+164

in € million	GER	USA	GB	Other	2021 Total
Discount rate					
−0.25%	+398	+12	+73	+9	+492
+0.25%	−367	−11	−69	−8	−455
Pension increases					
−0.25%	−136	0	−44	−1	−181
+0.25%	+143	0	+55	+1	+199
Life expectancy					
−1 year	−209	−7	−64	−3	−283
+1 year	+235	+7	+64	+3	+309

For the sensitivity analysis, pension obligations were re-measured. It was assumed that all other factors remain unchanged. For calculating the sensitivity of life expectancy, it was assumed that the average life expectancy of a 65-year-old individual will increase or decrease by one year.

Disclosures on medical care benefits

Certain foreign subsidiaries, particularly in the USA and Canada, grant post-retirement benefits to their employees if specific conditions as to age and period of employment are met.

The average maturity period of the defined benefit obligations is 8 years (2021: 11 years).

The development of the present value of the defined benefit obligations is presented as follows:

in € million	2022	2021
Present value of the defined benefit obligations as of Jan. 1	**166**	**172**
Current service cost	4	2
Past service costs	1	−2
Interest expenses	5	5
Payments made	−19	−16
Actuarial gains (−) and losses (+) from the change in demographic assumptions	0	4
Actuarial gains (−) and losses (+) from the change in financial assumptions	−46	−12
Actuarial gains (−) and losses (+) due to experience adjustments	26	−2
Net exchange differences from plans abroad	10	15
Present value of the defined benefit obligations as of Dec. 31	**147**	**166**

The premises for discounting for the purpose of calculating the obligations for medical care benefits vary depending on the circumstances in the individual countries. As of December 31, 2022, the valuation factors for discounting were between 4.8% and 10.0% (2021: 2.0% and 9.2%).

The net expenses of the obligations for medical care benefits comprise the following:

in € million	2022	2021
Current service costs	4	2
Past service costs	1	–2
Unwinding the discount on net liabilities	5	5
	10	**5**

The actuarial gains amounting to €20 million (2021: €10 million) are recorded in other comprehensive income with no effect on profit or loss.

The effect of a change in significant assumptions on the medical care obligations is shown in the following:

in € million	2022	2021
Discount rate		
– 0.25%	+3	+3
+ 0.25%	–3	–3
Life expectancy		
– 1 year	–5	–8
+ 1 year	+5	+8

25 Equity

Subscribed capital

At the end of the fiscal year, the subscribed capital still amounts to €500 million. As of December 31, 2022, the subscribed capital is divided into 500,000,000 registered shares. All shares are fully paid in.

Capital reserve

At the end of the fiscal year, the capital reserve still amounts to €386 million. The capital reserve comprises the premium on the issuance of shares. It is subject to the restrictions of Sec. 150 AktG (German Stock Corporation Law).

Other retained earnings

Other retained earnings contain the legal reserve of ZF Friedrichshafen AG and the accumulated earnings of the companies included in the consolidated financial statements to the extent that such accumulated earnings are not distributed. Asset and liability differences resulting from the capital consolidation in accordance with the book value method and the previously used accounting policies are also accounted for in this line item. Other components include the reserves from the first-time adoption of IFRS and the cumulative currency translation adjustments, which were reclassified when changing over to IFRS.

Foreign currency translation differences

The line item contains amounts not affecting profit or loss that result from the currency translation of the financial statements from foreign subsidiaries (non-euro area) recognized starting from the date of the first-time adoption of IFRS.

The change in equity resulting from foreign currency translation differences after tax amounting to +€170 million (2021: +€821 million) is attributed to non-controlling interests in the amount of –€14 million (2021: +€41 million) as well as –€2 million (2021: €0 million) to associates.

Fair value adjustment on securities and cash flow hedges

This line item includes the post-tax effects of the financial instruments valuation that do not affect profit or loss.

Actuarial gains and losses

This line item contains the actuarial gains and losses from employer pension plans after tax, with no effect on profit or loss.

Deferred taxes on equity items not affecting profit or loss

in € million 2022	Before income tax	Income tax	After tax
Foreign currency translation differences	175	−5	170
Mark-to-market of securities	10	2	12
Mark-to-market of cash flow hedges	38	−8	30
Actuarial gains and losses	1,609	−517	1,092
Other comprehensive income	**1,832**	**−528**	**1,304**
2021			
Foreign currency translation differences	819	2	821
Mark-to-market of securities	−7	1	−6
Mark-to-market of cash flow hedges	−36	11	−25
Actuarial gains and losses	1,277	−363	914
Other comprehensive income	**2,053**	**−349**	**1,704**

Sale of shares in consolidated companies without loss of control

In the prior year, 18.1% of the shares in WABCO India Limited were sold for a sales price of €236 million. The difference between the sales price and the carrying amount of the acquired non-controlling interests of €200 million was offset against retained earnings.

Dividends

ZF Friedrichshafen AG has proposed a dividend payout of €41 million for the fiscal year 2022 (€0.08 per share).

26 Disclosures on capital management

The primary objective of capital management at the consolidated ZF Group is to ensure the financial stability and independence of ZF and to meet the requirements of the shareholders and lenders. Ensuring a sufficient equity ratio is an important basis for achieving this objective. Net debt and the debt-equity ratio (net debt in relation to EBITDA) are central parameters for capital management at ZF with regard to external financing. The credit rating by the commissioned rating agencies is another vital indicator. The objective is to achieve a stable Group rating at investment grade level.

In order to determine the equity ratio, the equity disclosed in the consolidated statement of financial position is used.

	Dec. 31, 2022	Dec. 31, 2021
Equity in € million	8,595	7,123
Equity ratio in %	22	19

ZF Friedrichshafen AG is not subject to by-laws-based capital requirements.

27 Assets held for sale and liabilities of disposal groups

The assets and liabilities reported under this item as of December 31, 2022, relate to the Electronic Interfaces product line held for sale and headquartered in Diepholz (Germany). An agreement was reached on the sale with AEQUITA SE & Co. KGaA in March 2022. The Electronic Interfaces product line develops and produces shift lever systems, actuators and haptic control systems for the automotive industry with approximately 750 employees in Germany, China, Mexico and the USA. In accordance with the provisions of IFRS 5, the assets and liabilities to be disposed of were reclassified to form a disposal group upon reaching the agreement on the sale of the Electronic Interfaces product line.

Furthermore, this item contains the 50% share held for sale in CSG TRW Chassis Systems Co., Ltd in the amount of €21 million. CSG TRW Chassis Systems Co., Ltd., headquartered in Chongqing (China), is a joint venture that develops and produces brake and steering systems for the Chinese automotive market.

in € million	Dec. 31, 2022	Dec. 31, 2021
Cash and cash equivalents	12	0
Trade receivables	36	14
Inventories	31	43
Financial assets	4	0
Associates	21	0
Intangible assets	25	10
Property, plant and equipment	27	8
Deferred taxes	6	9
Sundry assets	6	4
Assets of the disposal group	**168**	**88**
Trade payables	32	6
Financial liabilities	2	0
Provisions for pensions	34	47
Other provisions	6	2
Sundry liabilities	16	4
Liabilities of the disposal group	**90**	**59**

NOTES TO THE CONSOLIDATED STATEMENT OF CASH FLOWS

28 General

The consolidated statement of cash flows shows how the cash position of the consolidated ZF Group changed in the fiscal year due to the inflow and outflow of funds. A distinction is drawn between cash flows from operating, investing and financing activities.

As part of the indirect calculation, the changes in financial line items taken into account in conjunction with the operating activities are adjusted for effects from the translation of foreign currencies and changes in the basis of consolidation. Changes in the respective financial line items can therefore not be reconciled to the corresponding values on the basis of the published consolidated statement of financial position.

The cash flows from investing and financing activities are determined on the basis of payments. The cash flow from operating activities, on the other hand, is indirectly derived from the net profit or loss before income tax.

Dividends and interest received are assigned to the cash flow from investing activities. Interest and transaction costs paid for borrowings, including lease liabilities, are included in cash flow from financing activities. To this end, the net profit or loss before income tax in the cash flow from operating activities is adjusted by the net result from participations and the financial result.

The cash position presented in the consolidated statement of cash flows covers all cash and cash equivalents reported in the consolidated statement of financial position, i.e., cash on hand and cash at banks, available at any time for use by the consolidated ZF Group. In addition, highly liquid financial investments that have a maturity of less than three months and that are subject to small fluctuations in value are assigned to the cash position.

The cash position is comprised as follows:

in € million	Dec. 31, 2022	Dec. 31, 2021
Cash and cash equivalents	2,518	2,332
Cash and cash equivalents of disposal groups	12	0
Total	2,530	**2,332**

29 Sale of consolidated companies

The divestments in assets and liabilities from the share deals relate to the following:

in € million	2022	2021
Current assets	125	39
thereof cash and cash equivalents	10	14
Non-current assets	70	1
Current liabilities	63	12
Non-current liabilities	50	0

The total sales prices for the sale of shares in fiscal year 2022 in the amount of €138 million (2021: €13 million) were fully paid in cash.

30 Acquisition of consolidated companies

The assets and liabilities of consolidated companies assumed on the date of acquisition are composed as follows:

in € million	2022	2021
Current assets	0	143
thereof cash and cash equivalents	0	21
Non-current assets	0	45
Current liabilities	0	114
Non-current liabilities	0	8

The total purchase price for the acquisitions of shares in the previous year amounted to €12 million.

31 Changes in financial liabilities

The change in financial liabilities from financing activities due to cash and non-cash effects is as follows:

	Financial liabilities	
in € million	Current	Non-current
Carrying amount as of Jan. 1	1,043	11,488
Change in cash	−736	898
Non-cash changes		
Reclassification	1,853	−1,853
Currency effects	4	72
Other	−2	187
Carrying amount as of Dec. 31	**2,162**	**10,792**

The presentation also includes lease liabilities for the first time. For this purpose, the initial amounts were adjusted. Changes in cash involve taking on and extinguishing financial liabilities. Other non-cash changes are primarily comprised of

changes in deferred interests (partly cash items) as well as the cancelation of loan-raising costs and the increase in lease liabilities due to new leasing contracts.

The presentation does not consider derivative financial instruments.

OTHER DISCLOSURES

32 Contingent liabilities

The following table shows contingent liabilities recognized at nominal values:

	Dec. 31, 2022	Dec. 31, 2021
Guarantees	11	90
thereof for participations	11	84
Other	197	138
	208	**228**

The guarantees are due within one year when fully utilized. The other contingent liabilities essentially refer to potential liabilities from procurement and personnel as well as from litigation and other taxes. As in the previous year, there were no collaterals for contingent liabilities during the fiscal year.

33 Other financial obligations

In addition to liabilities, provisions and contingent liabilities, other financial obligations consist of investment projects launched and procurement agreements initiated.

	Dec. 31, 2022	Dec. 31, 2021
Purchase commitments	1,482	746
Payment obligations on participations	31	36
	1,513	**782**

The purchase commitments can be broken down into intangible assets amounting to €7 million (2021: €7 million) and property, plant and equipment amounting to €1,475 million (2021: €739 million).

34 Litigation

ZF continues to be in close contact with the National Highway Traffic Safety Administration (NHTSA) in the USA in relation to the latter's investigation regarding certain vehicles that are equipped with ZF airbag control units and of which a few were subject to recalls by Toyota, FCA and HKMC. Based on the currently available investigation results, ZF does not believe to have culpably caused the recalls and is defending itself against lawsuits pending in the USA and Canada.

In connection with already concluded antitrust proceedings, ZF is dealing with customers with regard to possible claims for damages.

In principle, claims for damages may be asserted even in connection with completed proceedings. Neither ZF nor any of its Group companies are involved in current or foreseeable court or arbitration proceedings which, based on facts known today, have had in the past or could have a significant impact on the economic situation of the consolidated ZF Group.

35 Disclosures on financial instruments

Carrying amounts of the financial instruments by category

The following table shows the recognized financial assets and liabilities by measurement category:

in € million	Dec. 31, 2022	Dec. 31, 2021
Assets		
At amortized cost	7,739	7,938
At fair value through other comprehensive income		
Debt instruments	937	145
Equity instruments	57	40
At fair value through profit or loss	179	160
Derivative financial instruments (hedge accounting) [1]	63	25
	8,975	**8,308**
Liabilities		
At amortized cost	19,181	17,607
At fair value through profit or loss	39	16
Lease liabilities [1]	797	809
Derivative financial instruments (hedge accounting) [1]	43	44
	20,060	**18,476**

1) No measurement category in accordance with IFRS 9

In the fiscal year under review, there were no reclassifications of financial assets between the measurement categories.

Fair values

The fair values of the financial assets and liabilities are presented below. Provided that financial assets and liabilities are recognized at amortized cost, the fair value is compared to the carrying amount.

The following table shows the carrying amounts and the fair values of the financial assets and liabilities recognized at amortized cost. Due to short maturities, the carrying amounts of the current financial instruments recognized at cost approximate the fair values.

	Dec. 31, 2022		Dec. 31, 2021	
in € million	Carrying amount	Fair value	Carrying amount	Fair value
Assets				
At amortized cost				
Cash and cash equivalents	2,518	2,518	2,332	2,332
Financial receivables	160	160	134	134
Trade receivables	5,030	5,030	5,472	5,472
Other receivables	31	31	0	0
	7,739	**7,739**	**7,938**	**7,938**
Liabilities				
At amortized cost				
Bonds	7,826	6,882	7,745	8,078
Bonded loans	2,166	2,238	2,062	2,071
Liabilities to banks	2,099	2,105	1,878	1,885
Other financial liabilities	66	66	37	37
Trade payables	7,024	7,024	5,885	5,885
Lease liabilities [1]	797	-	809	-
	19,978	**18,315**	**18,416**	**17,956**

1) No measurement category in accordance with IFRS 9

In the following, the financial instruments are allocated to the three levels of the fair value hierarchy based on the input parameters used for measurement. The classification as well as the need to perform reclassifications is reviewed on the reporting date. Level 1 covers those financial instruments for which prices for identical assets and liabilities quoted on active markets are available. Allocation to level 2 occurs if input parameters are used for the measurement of financial instruments that are

directly (e.g., prices) or indirectly (e.g., derived from prices) observable on the market. Financial instruments whose valuation is based on information that is not observable on the market are reported in level 3.

The following table shows the allocation of the fair values of the financial instruments recognized at amortized cost to the three levels of the fair value hierarchy:

in € million	Level 1	Level 2	Level 3	Dec. 31, 2022 Total
Assets				
Cash and cash equivalents	0	2,518	0	2,518
Financial receivables	0	160	0	160
Trade receivables	0	5,030	0	5,030
Other receivables	0	31		31
	0	**7,739**	**0**	**7,739**
Liabilities				
Bonds	6,882	0	0	6,882
Bonded loans	0	2,238	0	2,238
Liabilities to banks	0	2,105	0	2,105
Other financial liabilities	0	66	0	66
Trade payables	0	7,024	0	7,024
	6,882	**11,433**	**0**	**18,315**

in € million	Level 1	Level 2	Level 3	Dec. 31, 2021 Total
Assets				
Cash and cash equivalents	0	2,332	0	2,332
Financial receivables	0	134	0	134
Trade receivables	0	5,472	0	5,472
	0	**7,938**	**0**	**7,938**
Liabilities				
Bonds	8,078	0	0	8,078
Bonded loans	0	2,071	0	2,071
Liabilities to banks	0	1,885	0	1,885
Other financial liabilities	0	37	0	37
Trade payables	0	5,885	0	5,885
	8,078	**9,878**	**0**	**17,956**

Except for bonds, the market values of assets and liabilities were calculated using the net present value method. Here, the future cash flows were discounted with the current risk-free interest rates matching the maturities plus a ZF-specific credit risk markup. Bonds were calculated using the fair value on the market.

The following tables show the financial instruments recognized at fair value.

in € million	Dec. 31, 2022	Dec. 31, 2021
Assets		
At fair value through other comprehensive income		
Securities	2	11
Investments in participations	55	29
Trade receivables	937	145
At fair value through profit or loss		
Securities	56	81
Investments in participations	56	48
Derivative financial instruments	62	31
Other receivables	5	0
Derivative financial instruments (hedge accounting) [1]	63	25
	1,236	**370**
Liabilities		
At fair value through profit or loss		
Derivative financial instruments	39	16
Derivative financial instruments (hedge accounting) [1]	43	44
	82	**60**

1) No measurement category in accordance with IFRS 9

In the following, the financial instruments recognized at fair value are allocated to the three levels of the fair value hierarchy based on the input parameters used for measurement.

in € million	Level 1	Level 2	Level 3	Dec. 31, 2022 Total
Assets				
Securities	17	27	14	58
Investments in participations	5	36	70	111
Trade receivables	0	937	0	937
Derivative financial instruments	0	125	0	125
Other receivables	0	5	0	5
	22	**1,130**	**84**	**1,236**
Liabilities				
Derivative financial instruments	0	82	0	82

in € million	Level 1	Level 2	Level 3	Dec. 31, 2021 Total
Assets				
Securities	74	18	0	92
Investments in participations	8	27	42	77
Trade receivables	0	145	0	145
Derivative financial instruments	0	56	0	56
	82	**246**	**42**	**370**
Liabilities				
Derivative financial instruments	0	60	0	60

In the fiscal year, no reclassification took place between levels 1 and 2 of the fair value hierarchy.

For level 1 securities, the fair value is recognized directly as the quoted price on an always active market. An active market is either the stock exchange of the respective country or a comparable trading platform offering the liquidity and transparency of the underlying asset. Level 2 includes classes whose prices can be derived or modeled from parameters which can be observed on the market. This includes in particular observable interest rates, exchange rates or comparable instruments. The level 3 securities are zero-coupon bonds for which no active market exists. The market values of level 3 securities are determined on the basis of currently available information from the funds' managers. A significant change of the underlying future cash flows and the interest rate, which implies a change of the discount factor, would influence the fair values of these securities.

Investments in participations included in level 1 and traded on an active market are recognized at share prices of the stock exchange of the respective country. With level 2 investments in participations measured at fair value, measurement is based on transactions that can be observed in the market. The level 3 investments in participations concern investments in companies that are not listed on the stock exchange. In case of these investments in participations recognized at fair value through profit or loss, there is either not enough information available or only a vast range of possible values can be determined for the fair value by using a multiplier method. The acquisition costs are therefore used to appropriately estimate the fair value. In case of changes in the environment of the participations or in case of proof due to external transactions, the estimate is adjusted accordingly. A significant change regarding the future results and multipliers used for the multiplier method would affect the fair value of these investments in participations in the amount of –€5 million to +€15 million.

The trade and other receivables measured at fair value are allocated to level 2 since measurement can be derived from parameters observable on the market.

The level 2 derivative financial instruments concern non-tradable derivatives. Fair values are determined on the basis of fixed prices quoted on approved stock exchanges discounted for the remaining term (foreign currency exchange rates, interest rates and raw material price indexes).

The following table illustrates the development of financial instruments assigned to level 3 of the fair value hierarchy:

	Investments in participations		Securities	
in € million	**2022**	2021	**2022**	2021
As of Jan. 1	42	56	0	0
Changes in the basis of consolidation	0	–15	0	0
Purchases	7	1	3	0
Reclassifications from level 2 to level 3	21	0	11	0
As of Dec. 31	**70**	**42**	**14**	**0**

During the fiscal year, investments in participations and securities from level 2 of the fair value hierarchy in the amount of €32 million were reclassified to level 3 as a result of the deteriorated market availability of the relevant investments in participations and securities in the current fiscal year compared to the prior year.

Net gains and losses by measurement category

in € million	Dec. 31, 2022 Total net gains and losses	Dec. 31, 2022 Thereof from interests	Dec. 31, 2021 Total net gains and losses	Dec. 31, 2021 Thereof from interests
At amortized cost				
Financial assets	163	57	–14	19
Financial liabilities	–390	–340	–274	–329
At fair value through profit or loss				
Financial assets and liabilities	–71	5	32	2
	–298	**–278**	**–256**	**–308**

Net gains and losses in the "Financial assets at amortized cost" measurement category primarily contain, in addition to interest income, exchange rate gains and losses from foreign currency receivables in the amount of +€131 million, as well as expenses from the change in write-downs in the amount of –€25 million.

In the "Financial liabilities at amortized cost" measurement category, apart from interest expenses, net gains and losses comprise exchange rate gains and losses from foreign currency liabilities in the amount of –€50 million.

Net gains and losses in the "Financial assets and liabilities at fair value through profit or loss" measurement category essentially include losses from derivative financial instruments excluding hedge accounting.

Offsetting financial assets and financial liabilities

Financial assets and liabilities which are subject to settlement agreements, enforceable master netting arrangements and similar agreements:

in € million	Dec. 31, 2022 Gross amount	Dec. 31, 2022 Offsetting	Dec. 31, 2022 Net amount
Offset items			
Trade receivables (current)	6,070	103	5,967
Trade payables (current)	7,113	103	7,010
Eligible for offsetting in the event of insolvency			
Derivative financial instruments (assets)	125	42	83
Derivative financial instruments (liabilities)	82	42	40

in € million	Dec. 31, 2021 Gross amount	Dec. 31, 2021 Offsetting	Dec. 31, 2021 Net amount
Offset items			
Trade receivables (current)	5,672	55	5,617
Trade payables (current)	5,910	55	5,855
Eligible for offsetting in the event of insolvency			
Derivative financial instruments (assets)	56	31	25
Derivative financial instruments (liabilities)	60	31	29

The framework contracts concluded with the banks for financial futures regulate, among other things, that in the event of insolvency of a contracting party, existing contracts will have to be terminated and settled at the respective market value. Provided that several transactions are settled for a contracting party, positive and negative market values are offset and only the remaining difference is settled. As of December 31, 2022, no risk arises from this regulation due to the excellent credit rating of our banks.

36 Risks from financial instruments

Management of financial risks

The risk management system within the finance area comprises counterparty and credit risks with customers and suppliers, liquidity and interest rate risks as well as currency and raw material price risks. Reports on the essential risk positions of the consolidated ZF Group are presented to the Board of Management and the Supervisory Board on a regular basis. Compliance with the guidelines is audited by Corporate Audit.

The companies of the consolidated ZF Group hedge their foreign currency risks in a standardized manner at prevailing market conditions either internally through the responsible ZF Treasury Hubs or directly externally with banks. Risk items hedged externally are traded with banks with excellent credit rating, taking into account the prescribed risk limits. In general, derivative financial instruments with plain vanilla character are used. These are used exclusively to hedge existing balance sheet items or forecast transactions. Hedge accounting is applied if the IFRS criteria are met. The Commercial Vehicle Solutions Division partially hedges its risk independently while following guidelines comparable to the consolidated ZF Group's hedging strategy. Integration into ZF's hedging strategy will be completed in 2023. Interest rate and raw material price risks are hedged on a case-by-case basis.

Hedging transactions are concluded in accordance with uniform corporate policies, following various jurisdictions' rules and regulations and in line with bank regulations on the operating of trading business. Such conclusions are subject to stringent monitoring, which is ensured in particular by the strict separation of duties between trading, settlement and control.

Credit and counterparty risk

Credit risk is the risk that our contracting parties in the areas of financial investments, financial receivables and trade receivables will not meet their payment obligations. This risk is defined based on calculated probabilities of default or information about the insolvency of contracting parties.

In order to reduce the counterparty risk for financial investments and derivatives, all financial transactions are carried out only with banks with a first-class credit rating within the framework of defined limits. These limits are reviewed quarterly and adjusted, if necessary. Input parameters for taking into account counterparty risk are ratings with a long-term perspective issued by independent rating agencies for the financial institutions participating in the respective transaction.

The financial assets of the consolidated Group lead to a maximum credit risk if one counterparty defaults, amounting to the carrying amount of the respective financial line item without considering collaterals received.

Outstanding trade receivables mainly comprise receivables from manufacturers of passenger cars and commercial vehicles, off-road machinery and wind turbines worldwide. In order to secure the entire value-added chain, the creditworthiness of our strategic suppliers is constantly monitored on the one hand, in particular by concentrating new contract awarding decisions on creditworthy suppliers. In order to reduce the credit risk in relation to customers on the other hand, the creditworthiness of customers as well as the related receivables are subject to continuous monitoring in the context of an SAP-based credit management. In some instances, credit risks are reduced by appropriate hedging measures such as trade credit insurances. The carrying amount of trade receivables covered by trade credit insurances as of December 31, 2022 is €51 million (2021: €52 million).

An asset-backed securitization program (ABS program) was implemented as an off-balance sheet measure. As part of the business practices customary for such programs, trade receivables are sold to a special purpose vehicle ("True Sale") on a revolving basis. As is also customary, a portion of the purchase price is retained in reserve accounts. These are reported as other receivables under other assets.

The following table illustrates the credit risk existing per risk category for trade receivables and contract assets as of the reporting date:

Dec. 31, 2022 in € million Risk category	Trade receivables	Contract assets
1	645	722
2	4,684	100
3	780	4
4	27	28
Receivables (gross)	**6,136**	**854**
Specific loss allowances	−99	0
Credit-based loss allowances	−70	−2
Receivables (net)	**5,967**	**852**

Dec. 31, 2021 in € million Risk category	Trade receivables	Contract assets
1	480	454
2	4,534	133
3	706	3
4	40	2
Receivables (gross)	**5,760**	**592**
Specific loss allowances	−60	0
Credit-based loss allowances	−83	−2
Receivables (net)	**5,617**	**590**

A specific loss allowance on receivables is recognized if there is an existing credit risk. The amount of the allowance mainly depends on the risk category and how long the receivable is overdue, and may be up to 100% in individual cases. A distinction is made between credit risk and business risk in assessing the recoverability of receivables.

Liquidity risk

The expected future outflow of funds due to principal and interest payments for financial liabilities and trade payables is contained in the medium-term liquidity planning.

The following table lists the maturity structure of principal and interest payments for the financial liabilities and trade payables:

in € million	Carrying amount Dec. 31, 2022 Total	Cash outflow		
		2023	2024 to 2028	2029 and beyond
Bonds	7,826	1,805	6,138	721
Bonded loans	2,166	185	2,190	66
Liabilities to banks	2,099	263	1,743	228
Other financial liabilities	66	45	12	9
Trade payables	7,024	7,010	14	0
	19,181	**9,308**	**10,097**	**1,024**

in € million	Carryin amount Dec 31, 2021 Total	Cash outflow		
		2022	2023 to 2027	2028 and beyond
Bonds	7,745	215	6,567	2,031
Bonded loans	2,062	629	1,472	51
Liabilities to banks	1,878	218	1,733	0
Other financial liabilities	37	13	16	10
Trade payables	5,885	5,855	30	0
	17,607	**6,930**	**9,818**	**2,092**

The solvency and the liquidity reserves within the consolidated ZF Group are managed on the basis of short-, medium- and long-term liquidity and financing planning. A sufficient amount of cash and cash equivalents as well as securities that

can be converted to cash and confirmed credit lines is held so that the solvency of the consolidated ZF Group is ensured at all times. Cash and cash equivalents amounted to €2,518 million as of the reporting date. The carrying amount of short-term securities was €24 million. The syndicated loan in the form of a revolving credit facility (RCF) was unused as of the reporting date. The credit line was refinanced in July 2022 and has a residual term until July 2027.

Reverse factoring agreements were concluded for trade payables in the amount of €199 million (2021: €61 million).

Market price risk from securities

The market price risk is the risk that the fair value of securities decreases. Due to the low portfolio of securities, the risk from market price fluctuations is considered immaterial. Therefore, a sensitivity analysis is dispensed with.

Foreign currency risk

The foreign currency risk is the risk that the fair values or future cash flows of monetary items are negatively influenced due to exchange rate changes. As a result of its international orientation, the ZF Group carries out transactions in different currencies.

The consolidated ZF Group follows a unified approach to managing currency risks. The hedging approach pursues a central and systematic currency risk assessment and strategy that includes regular survey rounds for expected risk items, risk assessment and the implementation of multi-layered hedging for a hedging horizon of 24 months.

The net principle applies to foreign currency hedging, i.e., hedging takes place for the net items from bilateral cash flows. Foreign currency hedging is carried out mainly via FX forward instruments. The intended hedging relationship between the designated amount of the hedged item and the designated amount of the hedging instrument amounts to up to 80%.

Individual hedging is generally carried out for the project business (gross principle). As a rule, the hedged item of project-related individual hedges is hedged in the full amount.

The translation risk from the measurement of line items is not hedged – the risks are monitored on a regular basis.

The economic relationship between the hedging instrument and the hedged item can be determined in terms of quality and quantity, and ZF assesses the effectiveness of this hedging relationship using the hypothetical derivatives method and linear regression. Ineffectiveness is largely expected to occur through changes in credit risk or from timing adjustments regarding the hedged item. In the current fiscal year, no gains from ineffective hedging relationships (2021: €0 million) were derecognized from the cash flow hedge reserve.

As of December 31, 2022, a liability with a partial amount of €500 million and a maturity period until 2023 is designated for hedging a net investment in a foreign operation of the same amount. The hedging instrument is reported under financial liabilities. The cumulative change in the value of the hedge of a net investment in a foreign operation amounts to €25 million and is included in other comprehensive income under foreign currency translation differences.

The expected cash outflow from derivative financial instruments entered into to hedge currency risks is presented below:

in € million	Market value as of Dec. 31, 2022 Total	Nominal value	Cash outflow Within a year	Cash outflow 1 to 5 years
Derivatives excl. hedge accounting				
Assets	35	1,352	1,327	25
Liabilities	−39	1,565	1,552	13
Cash flow hedge				
Assets	63	1,348	818	530
Liabilities	−43	798	672	126

in € million	Market value as of Dec. 31, 2021	Nominal value	Cash outflow Within a year	Cash outflow 1 to 5 years
Derivatives excl. hedge accounting				
Assets	31	1,438	1,427	11
Liabilities	−16	1,067	1,055	12
Cash flow hedge				
Assets	25	712	542	170
Liabilities	−44	1,085	768	317

For the purposes of hedging foreign currency risk, the hedging rates for the material currency pairs are as follows: 1.08 EUR/USD; 4.99 EUR/PLN; 21.18 USD/MXN; 7.06 USD/CNY. The hedging rates comprise derivatives including and excluding hedge accounting.

in € million	Change in value of hedging instrument 2022	Change in value of hedging instrument 2021	Change in value of hedged item 2022	Change in value of hedged item 2021
Cash flow hedge	20	−19	−20	19
Hedge of a net investment	32	0	−32	0

Sensitivity analysis

In terms of sensitivity to exchange rates volatility, ZF considers most relevant to evaluate the potential impact of EUR strengthening or weakening on its portfolio of outstanding cash flow hedge derivatives, as well as on un-hedged financing instruments such as loans and cash and cash equivalents in foreign currencies. For this purpose, the sensitivity of the portfolio of derivatives and financing instruments was determined for a 10% appreciation and depreciation of EUR versus all other currencies represented in the portfolio.

The following table shows the hypothetical effects on equity and profit or loss (in both cases excluding tax effects) within the scope of the aforementioned parameters:

in € million	Effect on equity Dec. 31, 2022	Effect on equity Dec. 31, 2021	Effect on profit or loss Dec. 31, 2022	Effect on profit or loss Dec. 31, 2021
Appreciation of the euro by +10%	−4	−2	−24	−11
Devaluation of the euro by −10%	6	1	26	7

Raw material price risk

The raw material price risk is the risk that the acquisition cost from the purchase of production equipment and operational materials will change. ZF is working on setting up a structured raw material hedging program.

Interest rate risk

The interest rate risk is the risk that either the fair values or future cash flows of financial instruments will fluctuate or future financings will become more expensive, both due to changes in the market interest rates. Facing increases in the reference rates, the consolidated ZF Group executed interest rate hedges in 2022 with the aim of reducing the potential impact of such increases and ensuring plannability for overall interest costs.

The hedging was performed by means of interest rate swaps and option instruments. The executed hedges cover 60% of the variable financing exposures over the full financing lifetime. The hedges are recognized as fair value hedges and are revaluated at market value. For IFRS purposes, no hedging relationship to the underlying business is documented.

The following tables indicate the effect on net profit or loss before income tax in the event of an increase or decrease in the average interest rate on financial investments as well as on variable-rate financial liabilities in the corresponding currency:

	Change in base points		Effect on net profit or loss before income tax (in € million)	
Investment of funds	**Dec. 31, 2022**	Dec. 31, 2021	**Dec. 31, 2022**	Dec. 31, 2021
EUR	+100 −100	+5 −5	+3 −3	+0 −0
USD	+100 −100	+40 −40	+1 −1	+1 −1
CNY	+100 −100	+15 −15	+8 −8	+1 −1

	Change in base points		Effect on net profit or loss before income tax (in € million)	
Financial liabilities	**Dec. 31, 2022**	Dec. 31, 2021	**Dec. 31, 2022**	Dec. 31, 2021
EUR	+100 −100	+5 −5	+15 −7	+0 −0
USD	+100 −100	+40 −40	−25 +25	−10 +10

The effect on net profit or loss before income tax of the variable-rate financial liabilities denominated in euros includes the effect from interest rate hedges.

The sensitivity analysis was drawn up under the assumption that the amount of loans from banks and of financial investments as well as the ratio of fixed and variable interest rates will remain at the same level.

In the current fiscal year, derivative interest rate instruments do not result in material cash outflows.

37 Government grants

In the fiscal year 2022, €61 million (2021: €65 million) in government grants were received. They were divided as follows:

in € million	**2022**	2021
Investment grants	25	17
Expense subsidies	36	48

Investment grants were mainly received for investments at locations in China, Serbia, Canada and the Czech Republic.

Expense subsidies mainly comprise research subsidies and subsidies for personnel expenses.

38 Related party transactions

Related party transactions have to be disclosed in accordance with IAS 24. The group of related parties includes associates, joint ventures and non-consolidated subsidiaries as well as persons who exercise a significant influence over the financial and operating policies of the consolidated ZF Group. The latter comprise all persons in key positions as well as close members of their family. In the consolidated ZF Group, these are the members of the Board of Management and the Supervisory Board. In addition, the Zeppelin Foundation as a special fund of the City of Friedrichshafen, the Dr. Jürgen and Irmgard Ulderup Foundation and their affiliated companies are considered related companies.

Transactions with related companies and the receivables and liabilities existing on the reporting date result without exception from the ordinary business activities and are displayed as follows:

2022 **in € million**	Joint ventures	Associates	Other participations
Supplies and services rendered	12	13	15
Supplies and services received	18	71	52
Receivables	5	6	9
Liabilities	0	28	5

2021 **in € million**	Joint ventures	Associates	Other participations
Supplies and services rendered	13	8	9
Supplies and services received	15	80	46
Receivables	6	9	12
Liabilities	1	23	4

39 Board of Management

Dr. Holger Klein (as of January 1, 2023)
Chief Executive Officer
Sales, Research & Development,
System House Autonomous Mobility Systems, Aftermarket

Wolf-Henning Scheider (until December 31, 2022)
Chief Executive Officer
Sales, Research & Development,
System House Autonomous Mobility Systems

Dr. Martin Fischer
Quality, North and South America Region,
Car Chassis Technology (as of January 1, 2023), Passive Safety Systems,
Active Safety Systems, Electronics and ADAS

Michael Frick (as of December 1, 2022)
Chief Financial Officer (as of January 1, 2023)
Finance, IT and M&A

Sabine Jaskula
Chief Human Resources Officer / Director of Labor Relations
Human Resources, Sustainability, Governance

Dr. Peter Laier (as of January 1, 2023)
Production, India Region,
Commercial Vehicle Solutions, Industrial Technology

Wilhelm Rehm (until December 31, 2022)
Materials Management, Commercial Vehicle Solutions,
Industrial Technology

Dr. Konstantin Sauer (until December 31, 2022)
Chief Financial Officer
Finance, IT and M&A

Stephan von Schuckmann
Materials Management, Asia-Pacific Region (both as of January 1, 2023),
Electrified Powertrain Technology

40 Supervisory Board

Dr. Heinrich Hiesinger
Chairman, former Chief Executive Officer of thyssenkrupp AG

Roman Zitzelsberger*
Deputy Chairman, District Manager of IG Metall for Baden-Württemberg

Jörg Amon*
Chairman of the Lemförde location Works Council
of ZF Friedrichshafen AG

Andreas Brand
First Mayor of the City of Friedrichshafen

Achim Dietrich*
Chairman of the Group Works Council of ZF Friedrichshafen AG

Robert Friedmann
Chairman of the Central Managing Board of the Würth Group

Klaus Helmrich
Former Member of the Board of Management of Siemens AG

Joachim Holzner*
Member of the Management Team of the Commercial Vehicle Solutions Division,
ZF Friedrichshafen AG

Peter Kippes*
Head of Functional Area Business Policy, IG Metall

Mario Kläs*
Chairman of the Saarbrücken location Works Council of ZF Friedrichshafen AG

Prof. Dr.-Ing. Gisela Lanza
Director of Production Systems at the wbk Institute of Production Science,
Karlsruhe Institute of Technology (KIT)

Dr. Joachim Meinecke
Lawyer (died on January 25, 2023)

Oliver Moll*
Chairman of the Schweinfurt location Works Council of ZF Friedrichshafen AG

Jürgen Otto
CEO of the s.Oliver Group

Hermann Sicklinger*
Chairman of the Passau location Works Council
of ZF Friedrichshafen AG

Dr. Mohsen Sohi
CEO of Freudenberg SE

Helene Sommer*
First Representative of IG Metall, Administration Center
Friedrichshafen-Upper Swabia

Dagmar Steinert
CFO of Rheinmetall AG

Axel Strotbek
Former Member of the Board of Management of Audi AG

Erdal Tahta*
Chairman of the Koblenz location Works Council of ZF Active Safety GmbH

* Employee representative

41 Board of Management and Supervisory Board compensation

The compensation of the Board of Management, as determined by the Supervisory Board of the consolidated ZF Group, comprises one fixed basic salary and two variable salary components, each consisting of short-term and long-term incentives. While the short-term incentive (STI) is based on the achievement of targets in the respective preceding fiscal year, the respective long-term incentive (LTI) is determined by reference to the business performance over a 3-year period. The remuneration structure is designed to facilitate a long-term positive development of the company.

Inflow in fiscal year 2022

In 2022, as in previous years, there were no changes in basic compensation and short-term incentives. The payment of basic salaries and short-term incentives to active members of the Board of Management for the fiscal year 2022 amounts to €10.0 million (2021: €11.2 million). The reduction is due to the lower target achievement in regard to short-term incentives, which reflects the ramifications of the Russia-Ukraine war, increasing material, energy and logistics costs, as well as the continuing shortage of semiconductors and the consequences of the Covid-19 pandemic.

The provisions amount booked as at December 31, 2022 for long-term incentives for 2020–2022 totaling €4.1 million is below the amount of long-term incentives for 2019–2021 paid out in April 2022 totaling €4.9 million. This reflects the challenging business development in 2021, as well as the past two years, which were dominated by the Covid-19 pandemic.

In total, payments (basic salaries as well as short-term variable incentives and long-term variable incentives) to active members of the Board of Management for the fiscal year 2022 amount to €14.1 million (2021: €16.1 million).

Expenses

For long-term incentives (LTIs), target figures to be achieved in the next three fiscal years are agreed before the beginning of a given fiscal year. Their payment is not guaranteed, but depends on the achievement of ambitious targets for ZF.

Currently, there are commitments for LTIs for the years 2020–2022, 2021–2023 and 2022–2024, which will be paid out after the end of the fiscal year in April of the following year. The entitlement to be recognized as an expense for all these future commitments is determined in each annual financial statement based on the latest estimates and plans, and the provisions are adjusted accordingly. Since we are again assuming that our business will improve in the future planning years, the expenses for variable long-term salary components in the amount of €7.8 million have increased compared to the previous year (2021: €5.3 million).

In addition, expenses for pension rights earned in the current fiscal year by the active members of the Board of Management total €3.8 million (2021: €3.7 million). With unchanged commitments, the slight increase results from actuarial factors. The total remuneration, consisting of fixed remuneration, short-term and potential, though partly not certain, long-term variable components as well as earned pension entitlements, amounts to €21.5 million (2021: €20.2 million).

The emoluments of former members of the Board of Management and their surviving dependents amount to €6.9 million (2021: €4.9 million). The pension provisions for former members of the Board of Management and their surviving dependents amount to €77.8 million (2021: €102.1 million).

The emoluments of the Supervisory Board for the fiscal year 2022 amount to €2.6 million (2021: €2.8 million).

Moreover, the companies of the consolidated ZF Group have not carried out any reportable transactions whatsoever with members of the Board of Management or the Supervisory Board of ZF Friedrichshafen AG and other members of management in key positions, or with companies in whose management or supervisory bodies these persons are represented. This also applies to close family members of this group of persons.

42 Personnel

The annual average number of employees was 162,614 (2021: 156,705), of whom 78,763 were direct employees (2021: 77,143) and 83,851 were indirect employees (2021: 79,562). At the end of the year, the consolidated ZF Group had 164,869 (2021: 157,549) employees. Direct employees are employees whose activities depend on the production volume and can be allocated directly to the products.

43 Appointed auditor fees

Fees of the consolidated ZF Group's auditing firm, Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft, recorded in the consolidated statement of profit or loss, amount to €3 million for auditing services. The total consolidated Group-wide fees of Ernst & Young amount to €14 million for auditing services, €3 million for other assurance services, as well as €1 million for other consulting services. Apart from Ernst & Young, other auditing companies work for the consolidated ZF Group.

44 Listing of the shares held as of December 31, 2022

Consolidated subsidiaries

National	Share of capital in %
Brake Force One GmbH, Tübingen, Germany	100.0
FTU Beteiligungsverwaltung GmbH, Auerbach, Germany	100.0
GAT – Gesellschaft für Antriebstechnik mbH, Alsdorf, Germany	100.0 [1)]
Lemförder Electronic GmbH, Espelkamp, Germany	100.0 [1)]
Lucas Automotive Grundstücksverwaltungs AG & Co. KG, Koblenz, Germany	100.0 [1)]
Lucas Varity Grundstücksverwaltungs AG & Co. KG, Koblenz, Germany	100.0 [1)]
Signata GmbH, Diepholz, Germany	100.0
Transics Deutschland GmbH, Hanover, Germany	100.0
TRW Deutschland Holding GmbH, Koblenz, Germany	100.0 [1)]
WABCO Fahrzeugsysteme GmbH, Hanover, Germany	100.0
WABCO Holding GmbH, Hanover, Germany	100.0
WABCO Radbremsen GmbH, Mannheim, Germany	100.0
WABCO Systeme GmbH, Hanover, Germany	100.0
ZF Active Safety GmbH, Koblenz, Germany	100.0 [1)]
ZF Airbag Germany GmbH, Aschau am Inn, Germany	100.0 [1)]
ZF Airbag Germany Grundstücksverwaltungs AG & Co. KG, Aschau am Inn, Germany	100.0 [1)]
ZF Asia-Pacific Holding GmbH, Friedrichshafen, Germany	100.0 [1)]
ZF Auslandsverwaltungs GmbH, Friedrichshafen, Germany	100.0
ZF Automotive Germany GmbH, Alfdorf, Germany	100.0 [1)]
ZF Automotive Germany Grundstücksverwaltungs AG & Co. KG, Alfdorf, Germany	100.0 [1)]
ZF Automotive Safety Germany GmbH, Aschaffenburg, Germany	100.0 [1)]
ZF Automotive Safety Germany Grundstücksverwaltungs AG & Co. KG, Aschaffenburg, Germany	100.0 [1)]
ZF Car eWallet GmbH, Berlin, Germany	100.0

National	Share of capital in %
ZF Chassis Modules GmbH, Stemwede, Germany	100.0
ZF CV Distribution Germany GmbH & Co. KG, Hanover, Germany	100.0
ZF CV Logistics Germany GmbH, Hanover, Germany	100.0
ZF CV Systems Hannover GmbH, Hanover, Germany	100.0
ZF Europa Beteiligungs GmbH, Friedrichshafen, Germany	100.0 [1]
ZF Finance GmbH, Friedrichshafen, Germany	100.0
ZF Gastronomie Service GmbH, Friedrichshafen, Germany	100.0 [1]
ZF Getriebe Brandenburg GmbH, Brandenburg, Germany	100.0 [1]
ZF Gusstechnologie GmbH, Nuremberg, Germany	100.0 [1]
ZF Industrieantriebe Witten GmbH, Witten, Germany	100.0 [1]
ZF Micro Mobility GmbH, Ravensburg, Germany	100.0 [1]
ZF Mobility Solutions GmbH, Ingolstadt, Germany	100.0 [1]
ZF NewCo II GmbH, Friedrichshafen, Germany	100.0
ZF Nürnberg Trading and Asset GmbH & Co. KG, Nuremberg, Germany	100.0 [1]
ZF Pegasus GmbH, Friedrichshafen, Germany	100.0 [1]
ZF RACE ENGINEERING GmbH, Schweinfurt, Germany	100.0 [1]
ZF Test Systems GmbH, Friedrichshafen, Germany	100.0
ZF Test Track Germany GmbH, Hanover, Germany	100.0
ZF Ventures GmbH, Friedrichshafen, Germany	100.0 [1]

1) The company lays claim to exemption in part or in full from disclosing the annual financial statements according to Sec. 264 (3) and Sec. 264b HGB (Commercial Code).

International	Share of capital in %
2 Getthere B.V., Utrecht, Netherlands	100.0
2 Getthere Holding B.V., Utrecht, Netherlands	100.0
Advanced Cargo Transhipment B.V., Utrecht, Netherlands	100.0
Alfaro Brakes S.L.U., Corella, Spain	100.0
Autocruise Ltd., Solihull, United Kingdom	100.0
Automotive Holdings (Spain) S.L.U., Vigo, Spain	100.0
Beespeed Technical Engineering Center S.R.L., Timișoara, Romania	100.0
Changchun WABCO Vehicle Control System Co., Ltd., Changchun, China	60.0
Clayton Dewandre Holdings Limited, Hull, United Kingdom	100.0
Compagnie Financière de ZF SAS, Andrézieux-Bouthéon, France	100.0
Dalphi Metal Espana, S.A., Vigo, Spain	100.0
Dalphi Metal Portugal, S.A., Vila Nova de Cerveira, Portugal	100.0
Delta Industrie Service SARL, Saint-Hilaire-de-Brethmas, France	100.0
Eurofren Investment, S. de R.L. de C.V., Cienega de Flores, Mexico	100.0
Eurofren Systems S.L.U, Mutliva Baja, Spain	100.0
FLC NV, Ypern, Belgium	100.0
Fortuna Assurance Company, Livonia, USA	100.0
Frenos y Mecanismos, S. de R.L. de C.V., Santa Rosa de Jarequi, Mexico	100.0
Friction Materials Group North America, Inc., Livonia, USA	100.0
Guangdong WABCO Vehicle Brakes Co., Ltd., Taishan, China	100.0
Ing. Tsetinis Beratungs GmbH, Kuchl, Austria	100.0
Kelsey-Hayes Holdings Inc., Livonia, USA	100.0
Kelsey-Hayes Mexico LLC, Reynosa, Mexico	100.0
Liuzhou ZF Machinery Co., Ltd., Liuzhou, China	51.0
LucasVarity Langzhong Brake Company Limited, Langfang, China	70.0
LucasVarity, Solihull, United Kingdom	100.0
Midwest Lemförder Limited, Darlaston, United Kingdom	100.0

International	Share of capital in %
OOO ZF Russia, Saint Petersburg, Russia	100.0
PT. ZFAG Aftermarket Jakarta, Jakarta, Indonesia	100.0
Qingdao FMG Asia Pacific Co., Ltd., Qingdao, China	100.0
Revestimientos Especiales de México, S. de R.L. de C.V., Cienega de Flores, Mexico	100.0
Roadster Automotive B.V., Amsterdam, Netherlands	100.0
Roadster Holdings (Canada) ULC, Toronto, Canada	100.0
Safe-Life – Industria de Componentes de Seguranca Automovel S.A., Ponte de Lima, Portugal	100.0
Shanghai Sachs Huizhong Shock Absorber Co., Ltd., Shanghai, China	60.0
Signata Bulgaria EOOD, Kuklen, Bulgaria	100.0
TAVARES B.V., Brussels, Belgium	100.0
Transics Belux B.V., Ypern, Belgium	100.0
Transics France SARL, Alès, France	100.0
TRANSICS International B.V., Ypern, Belgium	100.0
Transics Ireland Limited, Dublin, Ireland	100.0
Transics Italia S.r.l., Collegno, Italy	100.0
Transics Nederland B.V., Capelle aan den Ijssel, Netherlands	100.0
Transics Telemática España S.L.U., Madrid, Spain	100.0
TRW Aftermarket Asia Pacific PTE Ltd., Singapore Central, Singapore	100.0
TRW Airbag Systems SRL, Roman, Romania	100.0
TRW Australia Holdings Pty Ltd., Zetland, Australia	100.0
TRW Australia Pty Ltd., Zetland, Australia	100.0
TRW Auto B.V., Amsterdam, Netherlands	100.0
TRW Automotive China Holdings Ltd., Ebene, Mauritius	100.0
TRW Automotive Components Technical Service Shanghai Co. Ltd., Shanghai, China	100.0
TRW Automotive (LV) Corp., Livonia, USA	100.0
TRW Automotive Distribution France SAS, Puteaux, France	100.0

International	Share of capital in %
TRW Automotive España S.L.U., Pamplona, Spain	100.0
TRW Automotive Holding Mexico LLC, Reynosa, Mexico	100.0
TRW Automotive India Private Limited, Haryana, India	100.0
TRW Automotive Portugal Lda., Santos Domingos de Rana, Portugal	100.0
TRW Automotive Safety Systems SRL, Timișoara, Romania	100.0
TRW China Holdings Ltd., Grand Cayman, Cayman Islands	100.0
TRW Delplas, S. de R.L. de C.V., El Marqués, Mexico	100.0
TRW FAWER Automobile Safety Systems (Changchun) Co., Ltd., Changchun, China	60.0
TRW FAWER Commercial Vehicle Steering (Changchun) Co., Ltd., Changchun, China	55.0
TRW Intellectual Property Corp., Livonia, USA	100.0
TRW International Holdings B.V., Amsterdam, Netherlands	100.0
TRW Occupant Restraints de Chihuahua, S. de R.L. de C.V., Chihuahua, Mexico	100.0
TRW Odyssey Mexico LLC, Reynosa, Mexico	100.0
TRW Safety Systems Mexico LLC, Reynosa, Mexico	100.0
TRW Sistemas de Direcciones, S. de R.L. de C.V., El Marqués, Mexico	100.0
TRW Sistemas de Frenado S. de R.L. de C.V., El Marqués, Mexico	100.0
TRW Steering & Suspension Co., Ltd., Rayong, Thailand	100.0
TRW Steering Wheel Systems de Chihuahua, S. de R.L. de C.V., Chihuahua, Mexico	100.0
TRW Vehicle Safety Systems de Mexico, S. de R.L. de C.V., Reynosa, Mexico	100.0
Verona Holding Corp., Wilmington, USA	100.0
WABCO Air Compressor Holdings Inc., Auburn Hills, USA	100.0
WABCO Asia Private Ltd., Singapore, Singapore	100.0
WABCO Australia Pty Ltd., Melbourne, Australia	100.0
WABCO Automotive B.V., Capelle aan den IJssel, Netherlands	100.0
WABCO Automotive Control Systems Inc., Auburn Hills, USA	100.0
WABCO Automotive Mexico, S. de R.L. de C.V., San Luis Potosi, Mexico	100.0

International	Share of capital in %
WABCO Automotive Pension Trustees Limited, Batley, United Kingdom	100.0
WABCO Automotive Products Ltd., Grand Cayman, Cayman Islands	100.0
WABCO Comercial México S. de R.L. de C.V., Santa Fe, Mexico	100.0
WABCO Compressor Manufacturing Company, Charleston, USA	70.0
WABCO Europe Holdings B.V., Capelle aan den IJssel, Netherlands	100.0
WABCO Europe Holdings LLC, Auburn Hills, USA	100.0
WABCO Expats Inc., Auburn Hills, USA	100.0
WABCO Financial Services Srl, Brussels, Belgium	100.0
WABCO Foundation Brakes Private Limited, Chennai, India	100.0
WABCO Group Inc., Auburn Hills, USA	100.0
WABCO Group International Inc., Auburn Hills, USA	100.0
WABCO Holdings B.V., Capelle aan den IJssel, Netherlands	100.0
WABCO Holdings Inc., Auburn Hills, USA	100.0
WABCO Hong Kong Ltd., Hong Kong, China	100.0
WABCO International LLC, Auburn Hills, USA	100.0
WABCO IP Holdings LLC, Auburn Hills, USA	100.0
WABCO Korea Ltd., Suwon, Korea (Republic)	100.0
WABCO Logistics (Qingdao) Co., Ltd., Qingdao, China	100.0
WABCO RUS LLC, Moscow, Russia	100.0
WABCO Services SAS, Jossigny, France	100.0
WABCO USA LLC, Auburn Hills, USA	100.0
WABCO Vehicle Control Systems LLC, Auburn Hills, USA	100.0
WABCO Vehicle Control Systems S. de R.L. de C.V., Santa Fe, Mexico	100.0
WABCO Vostok LLC, Moscow, Russia	100.0
WBC C.V., Capelle aan den IJssel, Netherlands	100.0
ZF (China) Investment Co., Ltd., Shanghai, China	100.0
ZF (Guangzhou) Technologies Co., Ltd., Guangzhou, China	100.0

International	Share of capital in %
ZF (Shanghai) Management Co., Ltd., Shanghai, China	100.0
ZF (Thailand) Limited, Bangkok, Thailand	100.0
ZF Active Safety and Electronics US LLC, Livonia, USA	100.0
ZF Active Safety France SAS, Bouzonville, France	100.0
ZF Active Safety Slovakia s.r.o., Nove Mesto nad Vahom, Slovakia	100.0
ZF Active Safety US Holding Company, Livonia, USA	100.0
ZF Active Safety US Inc., Livonia, USA	100.0
ZF Aftermarket Iberica S.L.U., Pamplona, Spain	100.0
ZF Aftermarket Malaysia Sdn. Bhd., Senai, Malaysia	100.0
ZF ANSA Lemförder S.L. (Sociedad Unipersonal), Sant Cugat del Vallès, Spain	100.0
ZF AP Holdings Inc., Livonia, USA	100.0
ZF Argentina S.A., San Francisco, Argentina	100.0
ZF Asia B.V., Amsterdam, Netherlands	100.0
ZF Asia Pacific Group Co., Ltd., Shanghai, China	100.0
ZF Asia Pacific Pte. Ltd., Singapore Central, Singapore	100.0
ZF Auto Holdings US Inc., Livonia, USA	100.0
ZF Autocruise France SAS, Plouzane, France	100.0
ZF Automotive (Thailand) Co. Ltd., Bangkok, Thailand	100.0
ZF Automotive Aftermarket France SAS, Bonneval, France	100.0
ZF Automotive B.V., Amsterdam, Netherlands	100.0
ZF Automotive Brasil Ltda., Limeira, Brazil	100.0
ZF Automotive Canada Limited, Woodstock, Canada	100.0
ZF Automotive Components & Systems (Shanghai) Co., Ltd., Shanghai, China	100.0
ZF Automotive Czech s.r.o., Jablonec nad Nisou, Czech Republic	100.0
ZF Automotive Holding Italia S.r.l. Società Unipersonale, Turin, Italy	100.0
ZF Automotive Holdings (UK) Limited, Solihull, United Kingdom	100.0
ZF Automotive Holdings France SAS, Andrézieux-Bouthéon, France	100.0

International	Share of capital in %
ZF Automotive Italia S.r.l. Società Unipersonale, Turin, Italy	100.0
ZF Automotive J.V. US LLC, Livonia, USA	100.0
ZF Automotive Korea Co., Ltd., Ansan, Korea (Republic)	71.0
ZF Automotive Malaysia Sdn Bhd., Bukit Beruntung, Malaysia	100.0
ZF Automotive Passive Safety Systems (Shanghai) Co., Ltd., Shanghai, China	100.0
ZF Automotive Safety Technology (Rizhao) Co., Ltd., Rizhao, China	100.0
ZF Automotive Systems (Shanghai) Co., Ltd., Shanghai, China	100.0
ZF Automotive Systems (Wuhan) Co., Ltd., Wuhan, China	100.0
ZF Automotive Systems (Zhangjiagang) Co., Ltd., Zhangjiagang, China	100.0
ZF Automotive Systems Poland Sp. z o.o., Czestochowa, Poland	100.0
ZF Automotive Technologies (Shanghai) Co., Ltd., Shanghai, China	100.0
ZF Automotive Technologies (Zhangjiagang) Co., Ltd., Zhangjiagang, China	100.0
ZF Automotive UK Limited, Solihull, United Kingdom	100.0
ZF Automotive US Inc., Livonia, USA	100.0
ZF Automotive Vietnam Co., Ltd., Haiphong, Vietnam	100.0
ZF Axle Drives Marysville, LLC, Marysville, USA	100.0
ZF Boge Elastmetall Espana S.A.U., Santa Perpètua de Mogoda, Spain	100.0
ZF Bouthéon SAS, Andrézieux-Bouthéon, France	100.0
ZF Braking Systems Poland Sp. z o.o., Gliwice, Poland	100.0
ZF Brazil US LLC, Livonia, USA	100.0
ZF Chassis Components, LLC, Newton, USA	100.0
ZF Chassis Modules (USA) Inc., Wilmington, USA	100.0
ZF Chassis Modules (Windsor) Inc., Windsor, Canada	100.0
ZF Chassis Modules Toluca S. de R.L. de C.V., Toluca, Mexico	100.0
ZF Chassis System (Rayong) Co., Ltd., Rayong, Thailand	100.0
ZF Chassis Systems (Beijing) Co., Ltd., Beijing, China	100.0
ZF Chassis Systems Chicago, LLC, Chicago, USA	100.0

International	Share of capital in %
ZF Chassis Systems Duncan, LLC, Duncan, USA	100.0
ZF Chassis Systems Sdn. Bhd., Padang Serai, Malaysia	100.0
ZF Chassis Systems Tuscaloosa, LLC, Tuscaloosa, USA	100.0
ZF Chassis Systems Zatec s.r.o., Plzeň, Czech Republic	100.0
ZF Chassis Technology S.A. de C.V., Toluca, Mexico	100.0
ZF Chassistech Commercial Vehicles (Shanghai) Co., Ltd., Shanghai, China	100.0
ZF Commercial Vehicle Control Systems India Limited, Chennai, India	75.0
ZF Commercial Vehicle Distribution South Africa (PTY) Ltd., Germiston, South Africa	100.0
ZF Commercial Vehicle Solutions India Private Limited, Chennai, India	100.0
ZF Commercial Vehicle Systems (Jinan) Co., Ltd., Jinan, China	100.0
ZF Commercial Vehicle Systems (Qingdao) Co., Ltd., Qingdao, China	100.0
ZF Commercial Vehicle Technology (Jiaxing) Co., Ltd., Jiaxing, China	100.0
ZF Composites North America Ltd., Hamilton, Canada	100.0
ZF CV Control Systems Manufacturing India Private Limited, Chennai, India	75.0
ZF CV Distribution Austria GmbH, Vienna, Austria	100.0
ZF CV Distribution Belgium B.V., Brussels, Belgium	100.0
ZF CV Distribution Czech Republic s.r.o., Brno, Czech Republic	100.0
ZF CV Distribution France SAS, Jossigny, France	100.0
ZF CV Distribution Italy S.r.l. Società Unipersonale, Turin, Italy	100.0
ZF CV Distribution Poland Sp. z.o.o., Wrocław, Poland	100.0
ZF CV Distribution Spain S.L.U., Madrid, Spain	100.0
ZF CV Distribution Sweden AB, Gothenburg, Sweden	100.0
ZF CV Distribution UK Limited, Leeds, United Kingdom	100.0
ZF CV Logistics Brasil Ltda., Campinas, Brazil	100.0
ZF CV Middle East and Africa FZCO, Dubai, United Arab Emirates	100.0
ZF CV Solutions (Thailand) Limited, Rayong, Thailand	100.0
ZF CV Solutions Japan, Inc., Tokyo, Japan	90.0

International	Share of capital in %
ZF CV Systems Brasil Ltda., Campinas, Brazil	100.0
ZF CV Systems Europe B.V., Brussels, Belgium	100.0
ZF CV Systems Global GmbH, Bern, Switzerland	100.0
ZF CV Systems North America LLC, Auburn Hills, USA	100.0
ZF CV Systems Poland Sp. z.o.o., Wrocław, Poland	100.0
ZF CVS Turkey Fren Sistemleri Sanayi Ticaret Limited Şirketi, Istanbul, Turkey	100.0
ZF Danmark ApS, Tåstrup, Denmark	100.0
ZF Digital Solutions India Private Limited, Bangalore, India	100.0
ZF do Brasil Ltda., Sorocaba, Brazil	100.0
ZF Dongfang Automotive Safety Technology (Xi'an) Co., Ltd., Xi'an, China	90.0
ZF Dongfeng Shock Absorber Shiyan Co., Ltd., Shiyan, China	51.0
ZF Drivetech (Jiaxing) Co., Ltd., Jiaxing, China	100.0
ZF Drivetech (Suzhou) Co., Ltd., Suzhou, China	100.0
ZF Electric Mobility Technologies (Shenyang) Co., Ltd., Shenyang, China	100.0
ZF Electrified Powertrain Technologies (Hangzhou) Co., Ltd., Hangzhou, China	100.0
ZF Electronic Systems Juárez, S.A. de C.V., Juárez, Mexico	100.0
ZF Electronic Systems Monterrey S. de R.L. de C.V., Monterrey, Mexico	100.0
ZF Electronic Systems Pleasant Prairie, LLC, Pleasant Prairie, USA	100.0
ZF Electronics (Zhuhai) Co., Ltd., Zhuhai, China	100.0
ZF Electronics Klášterec s.r.o., Klášterec, Czech Republic	100.0
ZF Engineering Plzeň s.r.o., Plzeň, Czech Republic	100.0
ZF Europe B.V., Amsterdam, Netherlands	100.0
ZF Europe Finance B.V., Amsterdam, Netherlands	100.0
ZF Faster Propulsion Systems Co., Ltd., Kaohsiung, Taiwan	100.0
ZF FAWER Automotive Chassis Systems (Changchun) Co., Ltd., Changchun, China	60.0
ZF FAWER Chassis Technology (Changchun) Co., Ltd., Changchun, China	51.0
ZF FOTON Automated Transmission (Jiaxing) Co. Ltd., Jiaxing, China	51.0

International	Share of capital in %
ZF Gainesville, LLC, Gainesville, USA	100.0
ZF Heli Drivetech (Hefei) Co., Ltd., Hefei, China	51.0
ZF Holding Austria GmbH, Steyr, Austria	100.0
ZF Holdings Australia Pty. Ltd., Dingley Village, Australia	100.0
ZF Holdings B.V., Amsterdam, Netherlands	100.0
ZF Hungária Ipari és Kereskedelmi Korlátolt Felelősségú Társaság, Eger, Hungary	100.0
ZF India Holdings B.V., Amsterdam, Netherlands	100.0
ZF India Pvt. Ltd., Pune, India	100.0
ZF Inmobilaria S.A. de C.V., Saltillo, Mexico	100.0
ZF International B.V., Den Haag, Netherlands	100.0
ZF International Holdings Inc., Livonia, USA	100.0
ZF International UK Limited, Solihull, United Kingdom	100.0
ZF Italia S.r.l. Società Unipersonale, Assago, Italy	100.0
ZF Japan Co., Ltd., Yokohama, Japan	100.0
ZF Lemforder (Thailand) Co., Ltd., Rayong, Thailand	100.0
ZF Lemförder Achssysteme Ges.m.b.H., Lebring, Austria	100.0
ZF Lemförder Aks Modülleri Sanayi ve Ticaret Anonim Sirket, Izmir, Turkey	100.0
ZF Lemforder Australia Pty. Limited, Edinburgh, Australia	100.0
ZF Lemforder Automotive Systems (Shenyang) Co., Ltd., Shenyang, China	100.0
ZF Lemförder Chassis Technology Korea Co., Ltd., Gumi, Korea (Republic)	59.3
ZF Lemförder Métal France S.A.S., Florange, France	100.0
ZF Lemförder SA (Pty.) Ltd., Rosslyn, South Africa	100.0
ZF Lemforder Shanghai Chassistech Co., Ltd., Shanghai, China	76.0
ZF Lemförder TLM Dış Ticaret Limited Şirketi, Izmir, Turkey	100.0
ZF Lemförder TVA, S.A.U., Ermua, Spain	100.0
ZF Lemforder UK Limited, Darlaston, United Kingdom	100.0
ZF Light Vehicle Systems India Private Limited, Mumbai, India	100.0

International	Share of capital in %
ZF Marine Krimpen BV, Krimpen aan de Lek, Netherlands	100.0
ZF Marine Propulsion Systems Miramar, LLC, Miramar, USA	100.0
ZF México, S.A. de C.V., Guadalajara, Mexico	100.0
ZF Middle East FZE, Dubai, United Arab Emirates	100.0
ZF Mobility France S.A.S., Paris, France	100.0
ZF North America Capital, Inc., Northville, USA	100.0
ZF North America, Inc., Northville, USA	100.0
ZF Occupant Safety Systems de la Laguna, S. de R.L. de C.V., Durango, Mexico	100.0
ZF Off-Highway Solutions Minnesota Inc., North Mankato, USA	100.0
ZF OPENMATICS s.r.o., Plzeň, Czech Republic	100.0
ZF Österreich Gesellschaft m.b.H., Vienna, Austria	100.0
ZF Overseas Inc., Livonia, USA	100.0
ZF Padova S.r.l. Società Unipersonale, Selvazzano Dentro, Italy	100.0
ZF Passive Safety Czech s.r.o., Stara Boleslav, Czech Republic	100.0
ZF Passive Safety Korea Co., Ltd., Ansan, Korea (Republic)	100.0
ZF Passive Safety South Africa Inc., Livonia, USA	100.0
ZF Passive Safety Systems US Inc., Washington, USA	100.0
ZF Passive Safety US Inc., Livonia, USA	100.0
ZF Pension Sponsor UK Limited, Solihull, United Kingdom	100.0
ZF Philippines, Inc., Manila, Philippines	100.0
ZF Powertrain Modules (Shanghai) Co., Ltd., Shanghai, China	100.0
ZF Powertrain Modules Saltillo, S.A. de C.V., Ramos Arizpe, Mexico	100.0
ZF Powertrain Systems (Beijing) Co., Ltd., Beijing, China	100.0
ZF Rane Automotive India Private Limited, Chennai, India	51.0
ZF Rane Occupant Safety Systems Private Limited, Kanchipuram, India	51.0
ZF Restraints US Inc., Livonia, USA	100.0
ZF Sachs España S.A.U., Bilbao, Spain	100.0

International	Share of capital in %
ZF Sachs Italia S.p.A. Società Unipersonale, Candiolo, Italy	100.0
ZF Sachs Korea Co., Ltd., Changwon, Korea (Republic)	91.5
ZF Sachs South Africa Proprietary Limited, Alberton, South Africa	100.0
ZF Sachs Süspansiyon Sistemleri Sanayi ve Ticaret A.Ş., Gebze, Turkey	100.0
ZF Sales and Service (Malaysia) Sdn. Bhd., Petaling Jaya, Malaysia	100.0
ZF Serbia d.o.o. Pančevo, Pančevo, Serbia	100.0
ZF Services (China) Co., Ltd., Shanghai, China	100.0
ZF Services (Shanghai) Co., Ltd., Shanghai, China	100.0
ZF Services Australia Pty. Ltd., Sydney, Australia	100.0
ZF Services Belgium N.V.-SA, Brussels, Belgium	100.0
ZF Services España, S.L.U., Barberá del Vallés, Spain	100.0
ZF Services France S.A.S., Puteaux, France	100.0
ZF Services Hong Kong Limited, Hong Kong, China	100.0
ZF Services Korea Co., Ltd., Incheon, Korea (Republic)	100.0
ZF Services Middle East Limited Liability Company, Dubai, United Arab Emirates	49.0 [2)]
ZF Services Nederland B.V., Delfgauw, Netherlands	100.0
ZF Services Schweiz AG, Volketswil, Switzerland	100.0
ZF Services South Africa (Proprietary) Ltd., Johannesburg, South Africa	100.0
ZF Services Türk San. ve Tic. A.Ş., Istanbul, Turkey	100.0
ZF Services UK Limited, Nottingham, United Kingdom	100.0
ZF Services, LLC, Gainesville, USA	100.0
ZF Services, S.A. de C.V., Guadalajara, Mexico	100.0
ZF Slovakia a.s., Trnava, Slovakia	100.0
ZF South America Holdings B.V., Amsterdam, Netherlands	100.0
ZF Staňkov s.r.o., Staňkov, Czech Republic	100.0
ZF Steering Active Safety US Inc., Livonia, USA	100.0
ZF Steering Systems Poland Sp. z o.o., Czechowice-Dziedzice, Poland	100.0

International	Share of capital in %
ZF Steyr Präzisionstechnik GmbH, Steyr, Austria	100.0
ZF Suspension Technology Guadalajara, S.A. de C.V., Guadalajara, Mexico	100.0
ZF Taiwan Ltd., Taipei, Taiwan	100.0
ZF Test Track Sweden AB, Arvidsjaur, Sweden	100.0
ZF Transmissions Gray Court, LLC, Gray Court, USA	100.0
ZF Transmissions Shanghai Co., Ltd., Shanghai, China	51.0
ZF TRW Automotive Holdings Corp., Livonia, USA	100.0
ZF Wind Power (Tianjin) Co., Ltd., Tianjin, China	100.0
ZF Wind Power Antwerpen NV, Lommel, Belgium	100.0
ZF Wind Power Coimbatore Private Limited, Coimbatore, India	100.0
ZF Wind Power Singapore Pte. Ltd., Singapore Central, Singapore	100.0
ZF YTO (Luoyang) Axle Co., Ltd., Luoyang, China	51.0

2) 100% voting rights.

Consolidated companies accounted for using the equity method

National	Share of capital in %
ASAP Holding GmbH, Gaimersheim, Germany	35.0
doubleSlash Net-Business GmbH, Friedrichshafen, Germany	51.0
Ibeo Automotive Systems GmbH, Hamburg, Germany	43.8
WABCOWÜRTH Workshop Services GmbH, Hanover, Germany	50.0
International	
2getthere Asia Pte. Ltd., Singapore Central, Singapore	49.0
2Getthere B.V. Mechanical Equipment LLC, Abu Dhabi, United Arab Emirates	49.0
CSG TRW Chassis Systems Co., Ltd., Chongqing, China	50.0

National	Share of capital in %
embotech AG, Zurich, Switzerland	25.9
Evercast, S.A. de C.V., Saltillo, Mexico	30.0
FOTON ZF LCV Automated Transmission (Jiaxing) Co. Ltd., Jiaxing, China	40.0
S.M. Sistemas Modulares Ltda., Taubate, Brazil	50.0
Shanghai G7 WABCO IOT Technology Co., Ltd., Shanghai, China	50.0
SOMIC ZF Components Private Limited, New Delhi, India	50.0
TRW Sun Steering Wheels Private Limited, New Delhi, India	49.0
Wolong ZF Automotive Electric Motors Co., Ltd., Shaoxing, China	26.0
ZF Fonderie Lorraine S.A.S., Grosbliederstroff, France	49.0
ZF Hero Chassis Systems Private Limited, Gurugram, India	50.0
ZF PWK Mécacentre S.A.S., Saint-Étienne, France	50.0

Friedrichshafen, February 28, 2023

ZF Friedrichshafen AG
The Board of Management

Dr. Holger Klein (CEO) | Dr. Martin Fischer | Michael Frick

Sabine Jaskula | Dr. Peter Laier | Stephan von Schuckmann

Further Information

Independent auditor's report

To ZF Friedrichshafen AG

Report on the audit of the consolidated financial statements and of the group management report

Opinions

We have audited the consolidated financial statements of ZF Friedrichshafen AG, Friedrichshafen and its subsidiaries (the Group), which comprise the consolidated statement of profit or loss and consolidated statement of comprehensive income for the fiscal year January 1 to December 31, 2022, consolidated statement of financial position as at December 31, 2022, the consolidated statement of cash flows and the consolidated statement of changes in equity for the fiscal year from January 1 to December 31, 2022, and notes to the financial statements, including a summary of significant accounting policies. In addition, we have audited the group management report of ZF Friedrichshafen AG for the fiscal year from January 1 to December 31, 2022.

In our opinion, on the basis of the knowledge obtained in the audit,

- the accompanying consolidated financial statements comply, in all material respects, with the IFRSs as adopted by the EU, and the additional requirements of German commercial law pursuant to Sec. 315e HGB and, in compliance with these requirements, give a true and fair view of the assets, liabilities and financial position of the Group as at December 31, 2022 and of its financial performance for the fiscal year from January 1 to December 31, 2022, and
- the accompanying group management report as a whole provides an appropriate view of the Group's position. In all material respects, this group management report is consistent with the consolidated financial statements, complies with German legal requirements and appropriately presents the opportunities and risks of future development.

Pursuant to Sec. 322 (3) Sentence 1 HGB, we declare that our audit has not led to any reservations relating to the legal compliance of the consolidated financial statements and of the group management report.

Basis for the opinions

We conducted our audit of the consolidated financial statements and of the group management report in accordance with Sec. 317 HGB and in compliance with German Generally Accepted Standards for Financial Statement Audits promulgated by the Institut der Wirtschaftsprüfer [Institute of Public Auditors in Germany] (IDW). Our responsibilities under those requirements and principles are further described in the "Auditor's responsibilities for the audit of the consolidated financial statements and of the group management report" section of our auditor's report. We are independent of the Group entities in accordance with the requirements of German commercial and professional law, and we have fulfilled our other German professional responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinions on the consolidated financial statements and on the group management report.

Other information

The Supervisory Board is responsible for the report of the Supervisory Board. The executive directors are responsible for the other information. The other information comprises the prescribed parts of the Annual Report, which were provided to us prior to us issuing this auditor's report, specifically the following:

- Key Figures,
- Company Profile,
- Magazine for Fiscal Year,
- Management (a.o. Board of Management Letter and Report of the Supervisory Board),
- Sustainability,

but not the consolidated financial statements, nor the disclosures in the group management report included in our audit and not our auditor's report thereon.

Our opinions on the consolidated financial statements and on the group management report do not cover the other information, and consequently we do not express an opinion or any other form of assurance conclusion thereon.

In connection with our audit, our responsibility is to read the other information and, in so doing, to consider whether the other information

- is materially inconsistent with the consolidated financial statements, with the group management report or our knowledge obtained in the audit, or
- otherwise appears to be materially misstated.

Responsibilities of the executive directors and the supervisory board for the consolidated financial statements and the group management report

The executive directors are responsible for the preparation of the consolidated financial statements that comply, in all material respects, with IFRSs as adopted by the EU and the additional requirements of German commercial law pursuant to Sec 315e (1) HGB and that the consolidated financial statements, in compliance with these requirements, give a true and fair view of the assets, liabilities, financial position and financial performance of the Group. In addition, the executive directors are responsible for such internal control as they have determined necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, the executive directors are responsible for assessing the Group's ability to continue as a going concern. They also have the responsibility for disclosing, as applicable, matters related to going concern. In addition, they are responsible for financial reporting based on the going concern basis of accounting, unless there is an intention to liquidate the Group or to cease operations, or there is no realistic alternative but to do so.

Furthermore, the executive directors are responsible for the preparation of the group management report that, as a whole, provides an appropriate view of the Group's position and is, in all material respects, consistent with the consolidated financial statements, complies with German legal requirements and appropriately presents the opportunities and risks of future development. In addition, the executive directors are responsible for such arrangements and measures (systems) as they have considered necessary to enable the preparation of a group management report that is in accordance with the applicable German legal requirements, and to be able to provide sufficient appropriate evidence for the assertions in the group management report.

The supervisory board is responsible for overseeing the Group's financial reporting process for the preparation of the consolidated financial statements and of the group management report.

Auditor's responsibilities for the audit of the consolidated financial statements and of the group management report

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and whether the group management report as a whole provides an appropriate view of the Group's position and, in all material respects, is consistent with the consolidated financial statements and the knowledge obtained in the audit, complies with the German legal requirements and appropriately presents the opportunities and risks of future development, as well as to issue an auditor's report that includes our opinions on the consolidated financial statements and on the group management report.

Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Sec. 317 HGB and in compliance with German Generally Accepted Standards for Financial Statement Audits promulgated by the Institut der Wirtschaftsprüfer (IDW) will always detect a material misstatement. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements and this group management report.

We exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements and of the group management report, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinions. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit of the consolidated financial statements and of arrangements and measures (systems) relevant to the audit of the group management report in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of these systems.
- Evaluate the appropriateness of accounting policies used by the executive directors and the reasonableness of estimates made by the executive directors and related disclosures.

- Conclude on the appropriateness of the executive directors' use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in the auditor's report to the related disclosures in the consolidated financial statements and in the group management report or, if such disclosures are inadequate, to modify our respective opinions. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Group to cease to be able to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements present the underlying transactions and events in a manner that the consolidated financial statements give a true and fair view of the assets, liabilities, financial position and financial performance of the Group in compliance with IFRSs as adopted by the EU and the additional requirements of German commercial law pursuant to Sec. 315e (1) HGB.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express opinions on the consolidated financial statements and on the group management report. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our opinions.
- Evaluate the consistency of the group management report with the consolidated financial statements, its conformity with [German] law, and the view of the Group's position it provides.
- Perform audit procedures on the prospective information presented by the executive directors in the group management report. On the basis of sufficient appropriate audit evidence we evaluate, in particular, the significant assumptions used by the executive directors as a basis for the prospective information, and evaluate the proper derivation of the prospective information from these assumptions. We do not express a separate opinion on the prospective information and on the assumptions used as a basis. There is a substantial unavoidable risk that future events will differ materially from the prospective information.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Ravensburg, February 28, 2023

Ernst & Young GmbH
Wirtschaftsprüfungsgesellschaft

Scheufele	Renner
Wirtschaftsprüfer	Wirtschaftsprüferin
(German Public Auditor)	(German Public Auditor)

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In cases of doubt, the German version of this Report is binding.

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Investor Relations
investor.relations@zf.com
zf.com/ir

Sustainability
sustainability@zf.com
zf.com/sustainability

Corporate Communications
presse@zf.com
zf.com/press

Photos
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Concept, text and layout
Berichtsmanufaktur GmbH, Hamburg
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ZF Friedrichshafen AG
88038 Friedrichshafen
Germany
www.zf.com