



# changes



Annual Report 2019

# The year 2019

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## DUAL STRATEGY

The dual strategy was again our guiding principle in 2019: as well as optimizing the combustion engine, we were driving forward the development of alternative mobility concepts.

## SALES

MAHLE achieved sales of EUR 12.0 billion.

## RESEARCH AND DEVELOPMENT

With investments of EUR 751 million, we maintained our group-wide research and development activities at a high level.

## OPERATING CASH FLOW

We have substantially increased our operating cash flow by 21 percent.

## EMPLOYEES

MAHLE employed 77,015 people worldwide (reference date: December 31, 2019).

## MAHLE GROUP FIGURES

in EUR million	2019	2018	2017
Sales	12,049	12,581	12,788
EBITDA	712	1,377	960
EBIT	96	773	355
Result from business activities	10	614	262
Consolidated net loss/net income	-212	446	102
Tangible fixed assets	3,202	3,137	3,009
Capital expenditure on tangible fixed assets (without first consolidation)	549	609	612
Equity	2,742	3,014	2,632
Dividend paid by MAHLE GmbH*	5.4	13.4	7.5
Employees (as at Dec. 31)	77,015	79,564	78,277

\* Proposal for the specified business year

# Product portfolio

## ENGINE SYSTEMS AND COMPONENTS



As a global market leader in our key market segments, we have decades of systems and development expertise as well as extensive production experience to build on. Since our company's early days, the development of piston systems and cylinder components has been a core competence at MAHLE. Because we understand the interaction of all engine components, we can deliver optimal solutions to our customers. Our products are used around the globe in two-wheeled vehicles, passenger cars, commercial vehicles, and large engines. And the range is continuously being expanded, so that emissions and fuel consumption in combustion engines can be further reduced also in the future.

## THERMAL MANAGEMENT



The increasing electrification of the automotive and commercial vehicle industry calls for superior innovative strength in the thermal management of batteries and the entire electric powertrain. Thermal management is also essential for the ongoing development of the combustion engine. For instance, increasingly effective and efficient cooling systems are making a substantial contribution toward reducing fuel consumption. Air conditioning innovations are enabling new design concepts for interiors and helping to provide a high degree of thermal comfort in vehicles alongside efficiency improvements. Only innovative products from the Thermal Management business unit for batteries, fuel cells, power electronics, and electric drives make extended cruising ranges, high levels of efficiency, and long service lives possible and are thereby playing a significant role in shaping the shift toward zero-emission powertrains.

## FILTRATION AND ENGINE PERIPHERALS



MAHLE manufactures filters and oil coolers for engine and transmission applications—all of which are designed to increase the engine's efficiency and service life and reduce emissions. We are thus contributing to clean air and preventing engine damage resulting from oil and fuel contamination. Engine peripherals often vary due to different regional emissions regulations, individual car body shapes, and various power classes—even for identical basic engines. As a development partner and global market leader, in recent years, MAHLE has developed modular systems for every major product group on behalf of its customers.

## ELECTRONICS AND MECHATRONICS



Electronic and mechatronic components are making the crucial difference in enhancing the efficiency of the powertrain and advancing e-mobility. With its Electric Drive Systems, Actuators and Auxiliaries, and Control and Power Electronics product groups, MAHLE already offers relevant solutions in this area today. These activities are founded on our expertise in the development and manufacture of electric motors and electronic and mechatronic systems. Although these are used in a wide variety of applications, their technology is closely related, which affords synergies and economies of scale—two decisive factors of success in the automotive industry.



Rethinking, looking to the future, improving. Brothers Hermann and Ernst Mahle did a lot to advance mobility—always shaping change along the way. Their legacy extends far beyond revolutionary products like light-alloy pistons. With their visionary approach, the brothers began a success story that has continued for 100 years. Nowadays, MAHLE components are present in half of all the vehicles on the world’s roads. And each of them comes with a hint of the courage, enthusiasm, and irrepressible curiosity needed to make transportation more efficient, more environmentally friendly, and more comfortable for everyone. From day one.



Read more about MAHLE's anniversary year:  
[mahle.com/en/100-years/](https://mahle.com/en/100-years/)



# changes

Those who shape change can also take advantage of the chances it offers. New chances arise by questioning the status quo, daring to be different, and having the courage to embrace new ideas. That's the way it is at MAHLE. Instead of "picking a side," we continue to maximize the potential of existing and alternative powertrain technologies in equal measure, thereby further developing mobility. Our top-quality products get millions of people around the world to their destinations efficiently and reliably. Our Vision, "MAHLE—We shape future mobility," holds true for our future. Our Vision is our guiding star and a promise to our customers: with its innovative technologies, MAHLE will remain one of the most important designers of mobility in the future.

Let's do it. Let's take advantage of the chances that change brings.



Our Annual Report 2019 is also available online:  
[www.annualreport.mahle.com](http://www.annualreport.mahle.com)



## 04–07

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### **NO ACTION WITHOUT CHANGE**

Dr. Jörg Stratmann and Nathalie Cyrus talk about change, innovation, chances, and the future.

## 08–11

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### **PROTECTING THE CLIMATE WITH GREENER FUELS**

A look at the chance to make an important contribution to climate protection using the combustion engine.

## 12–19

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### **ELECTRIC DRIVING FOR EVERYONE**

Different countries, different perspectives, new chances. MAHLE is paving the way for the electrification of the most popular means of transportation in India: two- and three-wheelers.

## 20–23

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### **FROM PROVEN TO IMPROVED TECHNOLOGY**

How MAHLE is seizing the chance to apply tried-and-tested technology to a new drive.

## 24–33

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### **FROM INDUSTRY 4.0 TO MAHLE 4.0**

How MAHLE is turning digitalization to its advantage—and what chances this opens up for employees and customers.

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### **DIGITAL WORKSHOPS FOR DIFFERENT FORMS OF MOBILITY**

The new world of mobility is diverse—and can pose a challenge when it comes to maintenance and repair. MAHLE's first-class service equipment gives automobile garages the chance to operate more efficiently than ever.

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## »No action without change«

*Six pairs of terms, two perspectives, one interview with a difference.*

Dr. Jörg Stratmann, Chairman of the MAHLE Management Board and CEO, and Nathalie Cyrys, MAHLE trainee, discuss change, innovation, chances, and the future.

Changes

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Chances

**Dr. Jörg Stratmann:** Without change there's no action. And without action, there's no progress. But we mustn't overstep the mark—that's particularly true when it comes to the regulatory framework. But goals and standards should—and must—be ambitious. After all, one of MAHLE's great strengths lies in delivering smart and effective solutions, even for challenges that appear to be unsurmountable. Of course, periods of change, like the one we're currently experiencing in the automotive industry, also involve risk. But at MAHLE, we turn change into chances—chances that we seize.

**Nathalie Cyrys:** As a trainee and therefore a relatively new employee, I see change as a natural part of my everyday work. I think that every experience helps you progress, shapes you, and automatically changes you. Change—whether by choice or not—releases new energy and always opens up new perspectives and new opportunities. Even though these may seem minor at first glance. In the areas of MAHLE I've worked in so far, I've experienced an openness to new ideas and a willingness to play an active role in shaping change.







*Dr. Jörg Stratmann, Chairman of the Corporate Management Board and CEO of the MAHLE Group*

*Nathalie Cyrys, Trainee, has been working at MAHLE since 2018. As part of her trainee program, she has been through various departments and units of the company, including a stay in China.*

## Herculean task

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### Energy

**Nathalie Cyrys:** I draw my energy from cooperation, team spirit, and shared successes as well as from the motivation to develop new solutions. In my experience, a Herculean task becomes smaller when you realize that we can generate so much more energy together. I think this requires us to depart from existing processes at times, so that we can think more freely and develop new ideas.

**Dr. Jörg Stratmann:** The transformation of our industry is a Herculean task and a huge challenge for us. I've said that many times before. But when I look at our company and its many thousands of fantastic employees all around the world who devote their attention to our product solutions of the future with passion, inventiveness, and great enthusiasm, I see an energy that's making us strong for the future.

## Cost reduction program

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### New efficiencies

**Dr. Jörg Stratmann:** Being strong for the future also means being a strong competitor. We're responsible for a company that's on a sustainable footing. A company that's setting the right course in the transformation to ensure it remains well-positioned as a strong employer and partner to the automotive industry for the time that follows. Internal efficiency ensures profitability. This is an absolute prerequisite for survival in the international competitive environment of the future.

**Nathalie Cyrys:** Admittedly, the transformation and the resolute focus on greater efficiency are difficult and unexpected issues for someone like me who's just starting their career. Some situations make me feel uncertain, but at the same time I understand the need to use the available resources more responsibly. For me personally, that means doing things like prioritizing my tasks and objectives and using my energy as efficiently as possible.

»Working for a large company with a long history means being part of a bigger story.«

## Experience

## Innovation

**Nathalie Cyrys:** As a trainee, I benefit a great deal from the experience and expertise of my MAHLE colleagues. In return, I try to put forward fresh ideas and new ways of thinking to support my teams. I'm pleased that we have a good reputation with our customers and partners because we contribute a quality mind-set, reliability, and innovative strength. Based on these advantages, we're justified in our Vision to remain innovative influencers of mobility in the future.

**Dr. Jörg Stratmann:** To me, experience means change in the past. MAHLE now has 100 years to look back on—an entire century in which we've accumulated profound expertise in many important areas of development in the field of mobility. Today, we know where the challenges are. And innovation means using this experience in combination with good new ideas to find the right solutions to satisfy future requirements.



»Thanks to our past, we have the necessary foundations to face the future. It's only by knowing where we come from, what makes us who we are, and what we can do that we can successfully shape our future.«

## Past

## Future

**Dr. Jörg Stratmann:** Thanks to our past, we have the necessary foundations to face the future, from both a commercial and a cultural perspective. It's only by knowing where we come from, what makes us who we are, and what we can do that we can successfully shape our future. To do that we need a corporate culture that is not only founded on established expertise but also open to new ideas—the mutual inspiration of established thinking and the spirit of innovation.

**Nathalie Cyrus:** For me, working for a large company with a long history means being part of a bigger story. I find it thrilling to know that a product that goes into series production will be fitted into millions of vehicles around the world. As one of almost 80,000 employees, I can only make a small contribution—but together we can do something significant. By setting small things in motion, MAHLE makes achieving great things possible. I associate this with confidence and stability as we look to the future.

## Vision

## Reality

**Dr. Jörg Stratmann:** Our reality is what actually happens in the markets. Our Vision is to offer these markets the right solutions demanded by customers—to be one step ahead. Both today and tomorrow. We're recognized as influencers of mobility first and foremost when we focus our innovative strength on the real needs of the markets and customers. Today, mobility presents so many challenges and questions—and we must deliver the answers.

**Nathalie Cyrus:** I think that the Vision fits MAHLE as an influencer of mobility. We can unleash even more potential by breaking away from department boundaries and focusing on the strengths and skills that we possess as a whole. MAHLE has everything it needs to drive forward this important change. Defining and shaping sustainable and climate-friendly mobility for future generations is something that's close to my heart—and, together with the industry as a whole, we as employees have this in our power.

*With its International Trainee Program, MAHLE develops highly qualified junior staff specifically for their future positions in various technical or commercial departments in Germany and abroad.*

# Protecting the climate with greener fuels

## changes

### **A LOOK AT THE CHANCE TO MAKE AN IMPORTANT CONTRIBUTION TO CLIMATE PROTECTION USING THE COMBUSTION ENGINE.**

A yellow sticky note bearing the question “E-fuel?” lay on Cornelius Dosch’s desk when the automotive engineer took up his post in MAHLE’s Advanced Engineering department in 2017. Now the question has evolved into a powerful response: MAHLE’s components are e-fuel ready. A brief message with a big impact. E-fuels—that is to say, synthetically produced fuels—are added to conventional fuels to cut CO<sub>2</sub>. And they can be used in the existing fleet, which is precisely where it really matters at the moment: the majority of those vehicles with a combustion engine that are on the roads today, and will be tomorrow too. But how can e-fuels make the combustion engine more environmentally friendly, starting today? And what is the potential of these fuels for the future? A group-wide, interdisciplinary team from MAHLE set about discovering the answers. Let’s take a look at the key findings.





DR. PETER WIESKE, MAHLE Advanced Engineering, Stuttgart/Germany

»E-fuels are the most effective means of cutting CO<sub>2</sub> in the existing fleet too. This makes them an important complement to e-mobility when it comes to meeting the CO<sub>2</sub> targets in the transport sector.«



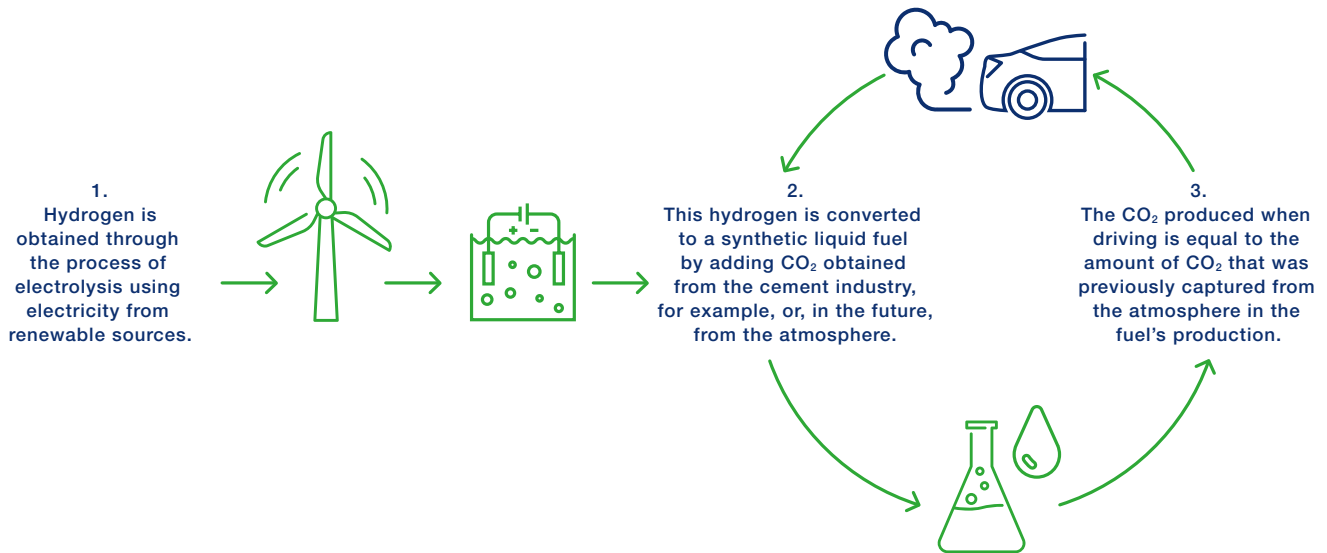
One MAHLE: a group-wide, interdisciplinary team of experts has been testing the influence of synthetic fuels on filter media and engine components currently offered by MAHLE. As a result, MAHLE is e-fuel ready. Pictured from left to right: André Marhofer, Cornelius Dosch, Dr. Peter Wieske, Michael Dohms, and Tobias Neubrand.

»E-fuels are ideally suited as replacements for products based on crude oil—in the automotive industry in the short and medium term, and in other areas like the chemical industry in the long term.«

## The e-fuel cycle

### VIRTUALLY CARBON NEUTRAL

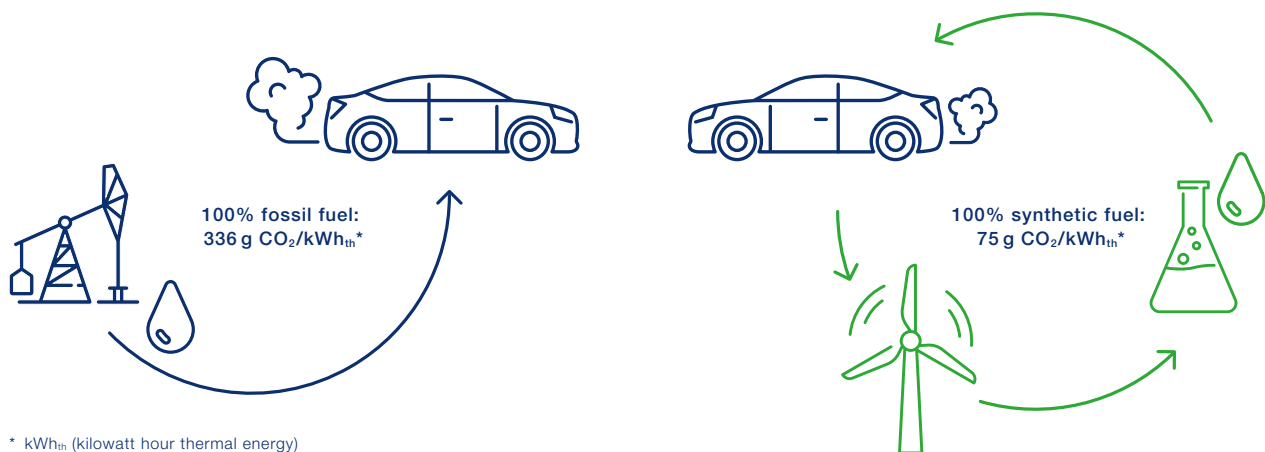
Synthetic fuels can make the combustion engine virtually carbon neutral, providing a major contribution to limiting global warming. For this to happen, a perfect cycle is needed.



## Synthetic fuel vs. fossil fuel

### A COMPLEMENT TO ELECTRIFICATION

With the help of e-fuels produced using renewables, fossil fuels can be phased out of the transport sector twice as quickly as a complement to electrification.







## 1. New focus

Are cars with a combustion engine automatically outmoded? Is driving an electric car automatically better and cleaner? How do the carbon footprints stack up when taking vehicle life cycles into account? There are many questions, and to answer them properly involves a great deal of technical complexity. But the fact is that the debate over which is the best powertrain type has led to uncertainty in recent years, especially among consumers. It's also clear that the proportion of electric vehicles will rise steadily in many regions of the world. At the same time, vehicles with a combustion engine will continue to be the right choice for numerous applications and still take large numbers of people and products to their destinations reliably, efficiently, and cleanly. Whether conventional or alternative drives, MAHLE is equally dedicated to them both. For 100 years now, the company has followed a simple maxim: don't rush to offer answers to complex questions, don't accept the seemingly obvious too hastily—instead, get to the bottom of things and consider the issues from a systemic perspective. After all, it's only by remaining open to all forms of technology in an approach based on scientific facts that we can exploit all possibilities for effectively reducing the emissions from road transport. Today, this philosophy is more valid than ever. Consequently, MAHLE remains convinced of the potential offered by the combustion engine and will continue to exploit this potential in the future too. The developers are not simply looking at the exhaust, but instead focusing on a much earlier stage. That's why a cross-functional team at MAHLE has been testing the influence of synthetic fuels on filter media and engine components currently offered by MAHLE. First on the engine test bench, and second in the field—that is, on the roads themselves and in cooperation with a German automobile manufacturer in the premium segment. The results are highly promising, since the engine components and filter media subjected to testing work just as efficiently and effectively with an admixture of certain e-fuels as with pure conventional fuels. It's simply a matter of getting the blend right. This is good news for the climate, for every motorist, and for Germany as a center for the automobile industry.

## 2. New fuels

Most vehicles in the current fleet on the roads today are powered by fossil fuels—products based on crude oil that are extracted from the ground. Synthetic fuels are based on the following idea: First, renewable energies like wind or solar are used to produce hydrogen from water. Next, these are converted into synthetic, liquid fuels through the addition of CO<sub>2</sub>. The amount of CO<sub>2</sub> captured in this process is equal to the amount emitted by the vehicle when this fuel is used in combustion. This cycle means that the e-fuel is carbon neutral. There are many different types of alternative fuels

from regenerative sources and, in principle, they offer great potential for reducing CO<sub>2</sub> emissions. MAHLE believes that the first generation of e-fuels will not cause any problem because they are assumed to comply with the standards of today's fuels. Two potential second-generation e-fuels tested by MAHLE that show promise are oxymethylene ether (OME) for diesel fuels and dimethyl carbonate (DMC) as an admixture for gasoline fuels. The MAHLE team investigated how the effectiveness and durability of the components and materials are affected when these e-fuels are admixed with conventional fuels. The results speak for themselves—MAHLE engine components and filters continue to function properly even when up to 20 percent of the tested synthetic fuels are mixed with the usual fuel. This means that a higher proportion than the fuel standard allows is technically possible today. And the good news for motorists is that MAHLE is e-fuel ready.

## 3. Standing ready

MAHLE's tests have shown that e-fuels are a powerful complement to e-mobility and another milestone on the road toward environmentally friendly mobility for all. But it will be some time yet before motorists can buy these new fuels at the pump. That is because there are many issues to take into account, including profitability considerations, investments in production facilities, the regulation of fuel standards, and legislation regarding CO<sub>2</sub>. Until then, MAHLE is focusing on its strengths: using its expertise, engineering skill, perseverance, and patience to continuously optimize its products. MAHLE has demonstrated that, thanks to e-fuels, there is potential for further optimization of the combustion engine and therefore for further reductions in CO<sub>2</sub> emissions from road transport. It's high time this potential is leveraged! As in many cases before, MAHLE has shown the way forward. Now it's time for others to get involved. ◀



1931

Always thinking ahead: Having taken the place of pistons made of heavy gray cast iron, the groundbreaking light-alloy piston presents problems due to premature wear. The solution is the ring carrier piston developed by Ernst Mahle. This technology is still widely used today.

# Electric driving for everyone

## **DIFFERENT COUNTRIES, DIFFERENT PERSPECTIVES, NEW CHANCES. MAHLE IS PAVING THE WAY FOR THE ELECTRIFICATION OF THE MOST POPULAR MEANS OF TRANSPORTATION IN INDIA: TWO- AND THREE-WHEELERS.**

In one of the most populous countries in the world, 1.3 billion people are on the move. While in Europe "on the move" immediately brings to mind four wheels, the general picture is different in India. The subcontinent is the world's largest manufacturer of two-wheelers. Every year, approximately 22 million new two-wheelers leave the production halls and fill the Indian roads. Loud, rattling, and roaring—they are all powered by the combustion engine. The two-wheeler moves the whole country. From transporting loads to an outing for a family of four. And right in the middle are the many young people who dominate the social scene. They want to break free, be more independent, make progress, and try out new things—including e-mobility. From the very start, MAHLE Electric Drives India has been the partner that is making this possible for them. Welcome to Coimbatore in India, to a euphoric team that is seizing a very special opportunity.

changes

*Shaping the future of mobility with a smile: Raj Kalra, President of MAHLE India, and Govindarajan Narayanan, Plant manager for MAHLE Electric Drives India in Coimbatore, are delighted by the chances arising from the electrification of two- and three-wheelers in India.*





UDAYARANI RADHAKRISHNAN, Engineer at MAHLE Electric Drives India

»The touch screen, the connectivity, the stylish design, and zero local emissions. We all want to ride an e-scooter.«



*Udayarani Radhakrishnan is a Purchasing team leader at the Coimbatore location. She still rides a conventional two-wheeler to commute the distance of around 10 kilometers to work.*



## A time of change

Beep-beep-beep-beep-beep. When out and about in India, you're surrounded by the sound of hundreds of horns. It doesn't come from the cars that are generally only pushing themselves through the dense traffic at walking pace, but from the countless two- and three-wheelers that fill every free space between the cars—beep-beep—to leave again immediately with a honk of the horn and a swift turn. Beep-beep. Udayarani Radhakrishnan is honking her horn too. After a 10 km drive across the city, this morning she leaves the crowded main road and turns into a tree-lined lane. Dogs sleep on the wayside, traders sell spices and coconuts behind their stalls, children run around their mothers, plucking at the colorful saris. Dust is whirled up. Udayarani turns off once more and stops at a parking lot that contains many other two-wheelers. After parking her scooter, Udayarani's path leads along a wall to a large gate that opens up into richly planted area. Walking at a steady pace, she heads toward one of two new buildings. The sky is bright blue, but another blue immediately catches the eye. At the top, on the roof of the first building, are the five blue letters that are accompanying the major mobility transformation in India: MAHLE. The day can begin at the new location of MAHLE Electric Drives India. Udayarani marches past the first building, from which soft machine noises are heard, and walks to the next—toward the office in the main building. She is an engineer, a team leader, and responsible for Purchasing. She first started work at the former joint venture MAHLE Letrika Roots India, in which MAHLE increased its share from 50 to 90 percent in 2019. She has been there for four years. And today she couldn't be prouder of her new task: to look for suitable suppliers that meet MAHLE's high quality standards and values to produce the products of the

future—electric traction motors and control units for two- and three-wheelers. This is because what has so far been supplied from Europe by MAHLE Electric Drives Slovenia will in the future be developed and produced entirely in India. While Udayarani takes her seat in the office, we meet two cheerful men in front of the main entrance, who have recognized the opportunity for MAHLE in India and want to help move things forward: Raj Kalra, President of MAHLE India, and Govindarajan Narayanan, plant manager for MAHLE Electric Drives India.

### Giving new energy to the country

"MAHLE is in the right place at the right time—with the right product," starts Raj. And "right" at this moment in India means one thing above all else: electric. Raj points to a new two-wheeler next to him. It's completely white, with an elaborate design and a pristine screen instead of a speedometer. An e-scooter. Hidden inside: the electric traction motor and the control unit from MAHLE. Raj and Govindarajan can tell you exactly why this e-scooter will very soon be dominating the Indian roads, because they know how their country works. From the mood on the streets to the politicians' objectives. "It's important to first understand the current situation in India," begins Raj. "We have very, very many young people here. Most of them are under 30 years old. And this young generation is changing. Incomes are rising. They want to move forward, to live in a more modern and more sustainable way. They love their smartphones and want to connect to every device and use the new features. With the e-scooter, they can see where they have been and how far they have traveled each day. Everything is electronic and linked together. That's what young people want." Govindarajan nods vigorously and continues immediately: "Then there is the pressure to respond urgently to air pollution, especially in the cities. Fifteen of the world's most



## E-mobility in India

### SUBSIDY PROGRAM FAME II

With the continuation of the FAME (Faster Adoption and Manufacturing of Hybrid & Electric Vehicles) subsidy program, India is using FAME II to make e-mobility as a whole even more attractive: from subsidies for e-buses to premiums for the purchase of electric vehicles through the reduction of VAT for electric vehicles and charging stations.

environmentally polluted cities are in India. The Indian government is supporting e-mobility for good reason. There is a comprehensive subsidy program to make alternative power-train technology more attractive and accessible to all.” With the electrification of two- and three-wheelers in India, MAHLE Electric Drives India is making exactly the right type of progress. Raj spells it out: “When it comes to CO<sub>2</sub> emissions, people always think of commercial vehicles and cars at first. But when 22 million new two-wheelers are powered by the combustion engine in India every year, they account for a considerable proportion of these emissions.” At the same time, the initial focus on electric two- and three-wheelers gives India the most effective and realistic chance of successfully driving forward e-mobility. Because even though the use of cars has grown with the increasing prosperity in the country, the electric car presents an even greater challenge for the Indian market. Most of all in terms of the charging infrastructure. An e-scooter, on the other hand, can be used with the existing infrastructure. It can simply be charged at home via the domestic electricity network.

### New product, new mind-set

We visit the newly installed production line together. Govindarajan picks up one of the traction motors that has just left the line. “There it is, our unique selling proposition. The motor is remarkably efficient and offers a long cruising range with lots of driving pleasure. And it’s inexpensive, despite the high quality standards.” Start of production is scheduled to

be in April 2020. This is just a start, because it takes time to build up local production capacity, especially when it comes to finding domestic suppliers. Components are still being supplied from Europe. By September 2020, some of the key components should be procured locally. By developing and producing traction motors exclusively in India, it is possible to create a high-quality, low-cost product. After all, efficient e-scooters are only useful if the population can afford them. MAHLE’s expertise, which is packaged in the small motor, has already inspired the confidence of new customers. “Our first major customer had some problems with the other motors he had already tested. After he was satisfied with ours, he launched the e-scooter successfully on the market.” It is already on the streets in two cities. Meanwhile—aside from us—it is precisely the people who want to see the e-scooter on the road who are also taking care of production. This is the young, emerging generation of India. These young employees are proud to work on this future technology. MAHLE is not only providing an exciting product, but also a culture that is inspiring the Indian team. “We like having the freedom to actively participate and have our own say. We have a great management team that encourages and trains us. The hierarchies are flat, and the paths are short,” is the general message that comes through.

Back on the ground. In the warm wind a flag is waving, on which “100 Years” is written. MAHLE is celebrating its anniversary. MAHLE Electric Drives India is still young, but in view of the first successful century of the company, the people in Coimbatore are looking confidently to the future.



## MAHLE electrifies the world

### MAHLE IS CONSISTENTLY IMPLEMENTING ITS DUAL STRATEGY AND FURTHER EXPANDING ITS POSITION AS A SYSTEMS PROVIDER FOR ALTERNATIVE DRIVE CONCEPTS

MAHLE Electric Drives India is part of the new Electronics and Mechatronics business unit, in which all activities in the area of electrics and electronics have been combined since January 1, 2020. The electric traction motors are only one aspect of the MAHLE product range in the area of e-mobility. From charging systems and power electronics to thermal management for engines, batteries, and cabins—MAHLE covers the entire spectrum.



*A young and motivated team develops and manufactures high-quality traction motors for e-scooters and auto-rickshaws at the location in the city of Coimbatore in southern India.*





Every year, around 22 million two-wheelers leave the production halls and fill India's roads. In India, the two-wheelers of the future are electric.



“Our Vision as a group is to shape future mobility. And with the location we have built here, this is precisely what we are doing. Because the two-wheeler belongs on the world’s streets. And here in India, we want to become the center of excellence for electric two- and three-wheelers.” While he’s saying this, Govindarajan backs up the statement with a little aside: “Last year, our customers asked us: How quickly could you install a production line here in Coimbatore?” Smiles all around. Six months later the new line was ready. At this pace, things will progress well.

The sun starts to go down. Time for Udayarani to leave work. How was the day? “There was a lot of negotiating.” She’s smiling. On the way to the parking lot she passes the e-scooter and casually mentions another advantage: “For us ladies, the e-scooter is even easier to handle, partly because it weighs less.” Then she gets on her two-wheeler and drives off. The streets are full again. Everything looks the same. But Udayarani knows that things will change very soon. And that she is playing an active role in this change. For the chance to launch a new type of mobility in India—one that is more dynamic, more efficient, and more sustainable than ever before. ◀



RAJ KALRA, President of MAHLE India, on the new e-scooter

»The young employees are desperate to work on the development and production of components for e-mobility. They know that this is the future.«



**1997**

Taking a different approach at an early stage: In 1997, a joint venture in India marks the breakthrough in the Far East with one of the first plants in Asia. The acquisitions of Japanese companies Izumi (1999) and Tennex (2001) represent major steps forward, with MAHLE becoming the world's largest supplier of filter systems. In subsequent years, the company expands its presence in Asia significantly.

changes

From  
proven to

improved  
technology

**HOW MAHLE IS SEIZING THE CHANCE TO APPLY  
TRIED-AND-TESTED TECHNOLOGY TO A NEW DRIVE.**

Driving to work, making a quick stop at the supermarket on the way home, and collecting the kids from sports practice—using only electric power. Then hitting the freeway at the weekend to visit the grandparents, without worrying about the cruising range of your car. A hybrid vehicle combines two drive concepts and enables the use of the most appropriate option for a particular driving situation. Whereas the energy for short distances comes from the battery, drivers can rely on the proven practical advantages of conventional or even synthetic fuels for longer journeys. Through its recently developed Modular Hybrid Powertrain (MMHP), MAHLE has given proven hybrid technology a decisive advantage. The Modular Hybrid Powertrain is a cost-efficient, compact, and low weight plug-in hybrid drive, which can be tailored to suit a wide range of vehicle applications. As a result, hybrid vehicles can play an even greater role in achieving climate goals in the future.



*Dedicated Hybrid Engine (DHE) designed in-house by MAHLE. Twin cylinder, turbocharged with passive MAHLE Jet Ignition® (MJl) for high fuel efficiency.*

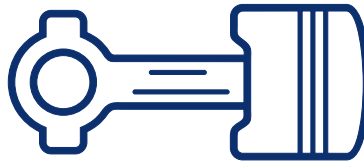


*MAHLE high voltage inverter integrated directly into generator housing. Direct drive traction motor (at rear of engine) also has integrated inverter.*

*Compact transmission with one, two, or four gears. Direct drive from traction motor, without a clutch, provides full vehicle dynamic performance.*

# The world of hybrid vehicles

Mild, full, or plug-in? Different types of hybrid, different characteristics.



## ELECTRIFIED DRIVING

### Mild hybrid

Small amount of electric power. The electric motor aids acceleration but is not powerful enough to drive the vehicle by itself. When driving, the combustion engine is always running.

### Full hybrid

Full power using two forms of technology. The electric motor and the combustion engine work independently, or combined with each other. This means that full hybrids can run entirely on electric power over short distances.

## EXTERNAL CHARGING

### Plug-in hybrid

A full hybrid concept with one advantage: the battery can be recharged via a plug from an external electricity source while the car is parked.

## NEW HYBRID ELECTRIC DRIVE

### MAHLE Modular Hybrid Powertrain (MMHP)

The MAHLE Modular Hybrid Powertrain includes an engine, generator, traction motor, transmission, and power electronics—all in one fully integrated assembly. The heart of the system is the MAHLE Dedicated Hybrid Engine, a combustion engine for use in hybrids developed in-house by MAHLE using a compact, twin-cylinder design with high fuel efficiency thanks to MAHLE's Jet Ignition® technology. This new hybrid electric drive with optimized cooling is low-cost, lightweight, compact, and adaptable for full vehicle dynamic performance. The benefits of the system at a glance: lower fuel consumption, reduced emissions, minimized package space, and easy to adapt to multiple vehicle applications.



**DR. MIKE BASSETT**, Chief engineer, Research & Advanced Engineering, at MAHLE Powertrain

»All technologies will need to make an effective contribution if we're to achieve the 2030 CO<sub>2</sub> emissions targets.«



Dr. Martin Berger, Vice President Corporate Research and Advanced Engineering at MAHLE

»With the MAHLE Modular Hybrid Powertrain, we've radically rethought the concept of the hybrid drive. This technology will enable us to leverage areas of potential that previously seemed unattainable.«



A classic combustion engine and an electric motor in one vehicle—these are the characteristics of a hybrid car. However, existing hybrid units still leave room for improvement. MAHLE quickly recognized that this process could be taken a step further, developing its own solution for this important future technology: MAHLE Modular Hybrid Powertrain (MMHP). Its combustion engine can follow a very simplified design since vehicle pull away and acceleration are covered by the electric motor. The MMHP combines the dedicated hybrid engine (DHE), generator, traction motor transmission, and power electronics in a fully integrated assembly. MAHLE also added its pre-chamber combustion system, known as MAHLE Jet Ignition®, or MJi, to the DHE to enable extremely efficient operation. The advantages of the system are that all of the necessary elements are integrated into a single compact, lightweight electric drive unit, making the whole system more efficient, smaller, lighter, lower-cost, and scalable for different vehicle sizes—from small city cars through heavy SUVs. This means that the powertrain technology is less expensive and therefore more attractive to the end customer. With its Modular Hybrid Powertrain, MAHLE is making another important contribution to narrowing the gap between conventional and purely electric mobility—as well as playing a timely and therefore valuable role in increasing the efficiency of mobility by striking a balance with its hybrid concept. ◀

## European Union's legislative target

### ON THE ROAD FOR 2030—AND BEYOND

Vehicle manufacturers in the EU must comply with much stricter fleet-wide CO<sub>2</sub> emissions targets by 2030. The targets adopted in 2019 prescribe a further reduction of 37.5 percent on average for the vehicle fleet—an ambitious target that trends suggest is unlikely to be achievable with conventional drives in this tight time horizon and under the current regulatory approach. Moreover, the emissions at the vehicle tail pipe are considered one-sidedly, without, for example, taking mileage or power generation into account for fossil fuels, or even for electricity and regenerative fuels. Effective climate protection requires a holistic approach that enables all technology options to contribute.



2005

Always setting new standards: MAHLE acquires the engine manufacturer Cosworth Technology—now MAHLE Powertrain. Two years later, in 2007, the group documents its systems competence with an innovative downsizing concept: half the displacement, the same power output—and 30 percent lower CO<sub>2</sub> emissions.

From  
Industry  
4.0



changes

to  
MAHLE  
4.0

*A digital production line in Montblanc/Spain that also benefited from an analog rethink: here, the employees go to the components instead of standing at a production line with the components coming to them.*



**HOW MAHLE IS TURNING DIGITALIZATION TO ITS ADVANTAGE—  
AND WHAT CHANCES THIS OPENS UP FOR EMPLOYEES AND CUSTOMERS.**

The world is at our fingertips 24/7, compact and glowing brightly behind a small screen. It's a world built from data, which is used to continuously expand the possibilities of our everyday lives. At MAHLE too, intelligent computer systems have long been implemented in the production lines and are visible as illuminated screens in the hands of employees and on the lines themselves. On a tour around the production plants of St. Michael/Austria and Montblanc/Spain, we find out about the specific added value that MAHLE is creating for its employees and customers through digitalization. It soon becomes clear that a 100-year-old company like MAHLE cannot be digitalized overnight—and that this isn't necessary either. Besides—and this is the best part of the story—digitalization needs one thing above all else: people who can shape and support a successful transformation.



*It didn't take Manfred Jesch long to put his cardboard aside and embrace the possibilities of virtual reality. Everything that makes the plant more efficient counts.*



## Acting faster with 4.0

Pa-pamm. Pa-pamm. Pa-pamm. The anvil pounds loudly in the MAHLE Filter Systems plant in St. Michael, as if to remind us that it too was once a groundbreaking innovation. We go a little further on, through the next door, and it's suddenly very peaceful. In just a few steps, we've left the old technology behind us and are standing next to the latest production line, which is quietly turning out oil filters for e-mobility applications. The divide between the two halls from different eras is a story that's playing out at many large companies that have been shaping mobility for decades. Location manager Thomas Berg sums up this narrative for the 50-year-old plant in St. Michael in a nutshell: "Digitalizing a long-established place like this is a very different challenge to simply building a new production hall on a fresh site today." When deciding which areas of production would benefit from digitalization, there is always one question to ask first: "What would make us, and therefore our customers, more successful?" Thomas Berg continues: "Industry 4.0 is just a buzzword. What themes does it involve that we can use to our advantage?"

And it's precisely this question that no software can answer—only a person can. One such person is Manfred Jesch, who has lived through and helped to shape developments at the St. Michael location for 24 years. His responsibilities include cardboard engineering, and today he is working with a completely new tool. Instead of building prototypes for workstations and production lines using cardboard and glue, Manfred Jesch now holds two controllers in his hands. And he's wearing a pair of virtual reality glasses. He moves his arms energetically and takes a few steps to the side. A large screen next to him shows what he's building. As he turns, a virtual box falls from a virtual shelf. Yet nothing actually happens. The creative design tool based on virtual reality technology helps the



# Supplementary training course

## DIGITALIZATION & SMART PRODUCTION FOREMEN

In collaboration with Wolfsberg Technical College (HTL Wolfsberg), MAHLE has introduced a new supplementary training course at the St. Michael location—digitalization foreman. Fifteen MAHLE employees are currently enrolled on the certified course. Within two years, they will be qualified to tackle future-oriented subjects such as coding and smart production.



team to model, simulate, and analyze workplaces, workflows, and processes quickly. Without wasting either time or materials. A model like this takes only a few days to set up rather than one or two weeks, as it used to. Only then is a prototype built. From cardboard, as before. Here in St. Michael, they call this the “soft transition” to digital transformation. People who understand how the digital programs work are in a better position to think things through if the new tools fail. After all, that’s something that happens to even the best programs. And it’s at precisely these moments that Manfred Jesch and his team need to get hands-on again.

### Perfect delivery every time with 4.0

“It’s thinking about it.” Around 1,600 kilometers south of St. Michael, a box of components rolls along the production line and stops under a smart camera. Roger Gombau, manager of the MAHLE plant in the Spanish town of Montblanc, stands next to the production line and taps his index finger several times against his temple. “That’s what it looks like when people think—but we don’t see what’s going on with the software,” says Gombau. The box rolls off to the left shortly afterwards. The next box stops. At first, and second, glance, it contains exactly the same components, but the camera sees more. The box rolls off to the right. Left, right, right, left, right. The production operation continues, all under the watchful eyes of MES, a system to optimize production introduced globally at MAHLE. The software monitors every single process step, saving all the data. All this takes place in conjunction with



MANFRED JESCH, Developer, MAHLE St. Michael, Austria

»Digitalization is an important tool to help us try out new things quickly, without wasting time and materials.«

data matrix codes, which are attached to every single component. To the touch, the code feels like a simple label, but it's actually a means of storing information and saves all the key data about the individual component.

Francisco Almagro, software and automation engineer at MAHLE in Montblanc, is enthusiastic about the development. "MES satisfies our curiosity. We're able to see what's going on in the machine and with the products whenever we want. That means we can ensure in real time that we're always delivering top quality." Before MES was introduced, the team in Montblanc had already independently developed its own solutions to improve production. "We realized that there were some obvious things on the production line that we could make use of already. Certain maneuvers like the pause between a braking operation and the next movement. Does the pause need to be that long? How many top-quality components can we make in a certain time?" Francisco and his team used the data to reprogram the machines. The solution is regarded internally as a precursor to MES. Pride over this proactive step is palpable here in Montblanc. Anyone who talks about MES today is also always talking about Francisco and his team.

### Discovering new worlds with 4.0

Jared Sowa manages the Metrology department and has worked at MAHLE for 15 years. We find him standing in a brightly lit, white room. Delicate rods move on five heavy machines, measuring individual components by touch. In between them, a small number of employees sit behind a few isolated screens. The real "superstar" among all the machinery stands inconspicuously in the far corner: a CT scanner. "When it comes to taking measurements, this machine is absolutely state-of-the-art," Jared Sowa proudly explains. "By using radiography techniques, we can test components without destroying them. Instead of cutting into them, we X-ray them and look inside. This allows us to take many more measurements than before." And he adds straightaway: "And when we've measured a component, we can store the data and even just take measurements from that data if necessary. The component itself is no longer needed." ➤

*Robots, software, and people work in harmony. Tasks are reorganized and employees assigned to positions in which they will create new added value.*



**FRANCISCO ALMAGRO**, Software and automation engineer at MAHLE in Montblanc/Spain

»We can see what's happening in the machine in real time and protect our products against defects, because they don't arise in the first place.«



»Our main job is to communicate digital knowledge to the team. And at the same time, we ourselves also need to keep on learning on a daily basis.«



## All data added to the flow

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### MATERIAL DATA

Management of the entire product life cycle by means of a globally accessible system using One PLM.

### OPERATING DATA

Production optimization, a high degree of transparency with regard to material and value flows using MES.

### PERSONNEL DATA

HR excellence is key to MAHLE's success—personnel management based on skills and strategy.

### SYSTEM DATA

Increasing efficiency by means of process standardization through the creation of a global, digital platform for real-time data and processes.

### FINANCIAL DATA

The administration of our complex corporate structure and the consolidation of our business results.

### SUPPLIER DATA

Making use of our global procurement strategy for production and nonproduction materials.

No data without data managers. As well as providing digital infrastructure, it's essential that we nurture the digital culture. This means keeping all employees informed, training them, and exciting them about the possibilities opened up by digitalization.

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*As experts in production and IT, Francisco Almagro (right) and Joan Andreu Boque are driving forward the process of networking all the machines in the Montblanc plant.*

CRISTINA BARCO, Engineer at MAHLE in Montblanc/Spain

»We need to learn new things every day. A high degree of flexibility and creativity are key to the digitalization process.«



More space, more information, and customers who are even more satisfied. Using radiographic measurement methods, problems with components can be understood—in some cases, understood properly for the first time—and resolved faster. As Jared Sowa opens the CT scanner's door and reveals its interior, our gaze falls on the warning notice about radiation protection. This gives rise to the question of how much a profession can change through digitalization. "I'm now learning about radiography techniques. The metrologist role I now hold is actually 90 percent different from the standard metrologist role I started out in." He smiles. And what this means needs no analysis. Digitalization offers employees the opportunity to learn more about their own processes and materials than they knew before—giving them the chance to feel like digital Columbuses, entering a new world in the search for innovative solutions to benefit themselves and their customers.

### Specializing in new ways of thinking with 4.0

Twenty years ago, Cristina Barco was the first female engineer at the Maintenance department at MAHLE in Montblanc. To her, digitalization means one thing above all: never stopping learning, thinking in new ways, being creative. In digital as well as analog forms. "Digitalization supports us, but we can't rely on it completely. Every solution counts when you're striving to improve." She points to a

*Cristina Barco was the first female engineer in the Maintenance department at MAHLE in Montblanc and has been helping to shape change at the location for 20 years.*

*Over the years, Jared Sowa has learned many different measurement methods. Radiography is the latest technique and provides more data than ever before.*

bay right next to her. Alongside the implementation of MES, the entire production line was redesigned, with the result that several employees within a production line are now pushing trolleys on which they are assembling a component. While at the other bays, the components are brought to the employees, here the employees go to the components. Cristina grimaces as she says the word “trolley” — then she laughs. Those were the exact same reactions when the idea was first put forward. It sounded like a backward step. “But if you ask the employees today, they’re happier, because moving is physically good for you and keeps your mind alert,” she adds. “They make far fewer mistakes as a result. The data from MES backs this up.”

Just then, a robot arm stops next to us. It’s a collaborative robot, which is helping an employee with her work. When she touches it, it stands still. “The employee has the last word,” notes Cristina. The team jointly developed the robot with Francisco. A screen above the bay now displays the number four. So, what does Industry 4.0 mean for MAHLE? It’s the opportunity to use digitalization as a new team member, who works side by side with the employees to drive MAHLE forward. To be a young, dynamic company, offering its customers an even more effective partnership and the best possible products for mobility applications. After all, everyone benefits from the best products and solutions. And when quitting time comes around, and the employees get into their cars and drive home, digitalization continues working at MAHLE. Just the way people want it to. ◀



**JARED SOWA**, Head of Measurement Technology at MAHLE in St. Michael/Austria

»The component has gone to the customer, but we have the production data. This allows us to check everything, measure it again, and learn more about the component than ever before.«



ROGER GOMBAU, Plant manager at MAHLE in Montblanc/Spain

»The process is bringing together highly experienced employees with incredible expertise and young engineers with a whole new mind-set. As a company, we make sure that they have access to all the resources they need to put their ideas and solutions forward. And by working together, we're not simply digitalizing production, we're making it more successful.«



*Digitalization is a team task: the team in St. Michael/Austria talks about the latest issues, discusses proposed solutions, and exchanges ideas on a daily basis.*



**1972**

Always staying true to its roots: comeback of the filter business. Its significant holding in Knecht Filterwerke allows MAHLE to reintroduce filter activities into its product range, having discontinued them in 1941 due to the war. The product area soon becomes one of the mainstays of the group.



# Digital workshops for different forms of mobility

**THE NEW WORLD OF MOBILITY IS DIVERSE—AND CAN POSE A CHALLENGE WHEN IT COMES TO MAINTENANCE AND REPAIR. MAHLE'S FIRST-CLASS SERVICE EQUIPMENT GIVES AUTOMOBILE GARAGES THE CHANCE TO OPERATE MORE EFFICIENTLY THAN EVER.**

Somma Lombardo/Italy. The light of the rising sun may still be glinting off the name GALLIDABINO, written in big letters high up on the exterior wall of the garage, but there's already a lot of activity in the yard below. With a push, one car after another is moved through an open roller door into the workshop. When you enter, it's clear that the word "workshop" no longer quite fits. It's a large hall, flooded with light and remarkably clean, tidy, and quiet. The vehicles that are being serviced or repaired here today stand side by side—they're different models, but equally complex. And it's precisely these new technologies that call for new solutions. This is what MAHLE Service Solutions offers—with innovative products and services that streamline and sometimes even revolutionize the work to be carried out. Join us on a visit to the Gallidabino car garage, run by long-standing partners and friends.

*The family business owned by Andrea Gallidabino (right) and his brother Luca Gallidabino is over 50 years old.*





changes



*TechPRO® Digital ADAS is the world's first digital calibration panel for calibrating the driver assistance systems of modern vehicles correctly and efficiently.*





## A vision that's growing

"In the past, cars were constructed much more simply, but they still seemed like spaceships to me. When other children went out to play after school, I preferred to go to the workshop. I loved the smell of gasoline and diesel," recalls Andrea Gallidabino. That little boy is now a grown man, and he and his brother Luca co-own the automobile garage founded over 50 years ago by their father Dorino Gallidabino. Their 15,800 customers rely on their expertise, with over 1,000 vehicles rolling through their workshop doors each month—many of them traveling up to 100 kilometers to get there. They come from far and wide because something made an impression on Andrea early on: "The customers' reaction of total satisfaction when they came to collect their repaired cars." The satisfied look on their faces motivated the Gallidabino brothers to develop their small-scale operation into one of the largest and most state-of-the-art automobile garages around, where every fault is identified on every vehicle and then efficiently repaired. Repaired, that is, by a team that is always working to expand its technological skills in order to face the daily challenges that await with the opening of the roller door: yet another model of car, another new technology, and another problem. But finding the solution takes more than just trained employees—the correct equipment is needed too. "Even the most talented mechanics are stuck without the right tools," says Andrea, summing up the situation faced by workshops today. And which are the right tools? Andrea's answer is clear: "Our sales partner, TECNO SYSTEM, drew our attention to MAHLE's products. Since then, we've put our trust in their knowledge and experience when it comes to choosing new technology for our workshop."

## Always improving

Andrea Lupi from MAHLE Service Solutions is a partner who supplies these technologies. His story starts differently: "In the past, I couldn't get my head around machines and engines. That's why I became an electrical engineer. When I joined BRAIN BEE\* 22 years ago, I started working with vehicles via the world of electronics." A world that is becoming more and

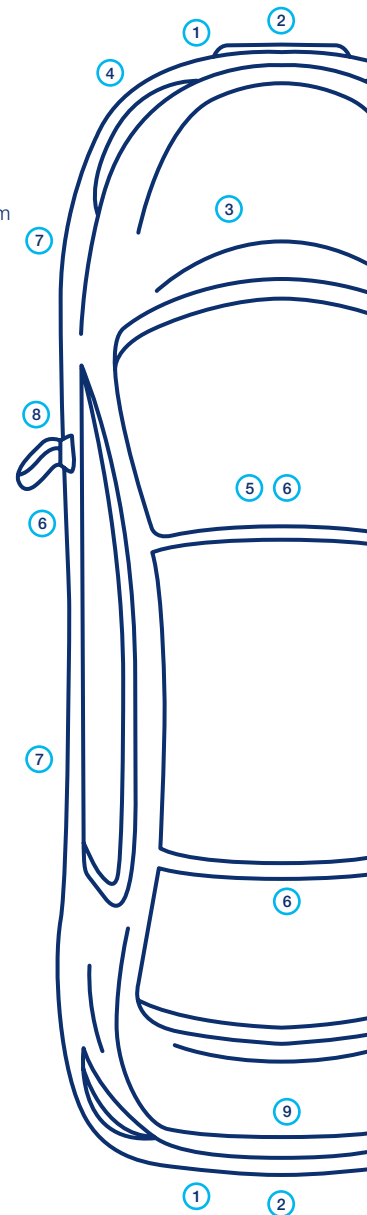


ANDREA GALLIDABINO, Workshop owner, Somma Lombardo/Italy

»We don't have time to wait and see how technology develops. We need to be proactive and continue investing in workshop equipment.«

## Intelligent repairs for intelligent vehicles

- 1 Parking aids
- 2 Park assist
- 3 Cruise control
- 4 Lane departure warning system
- 5 Speed limit display
- 6 Collision avoidance assist
- 7 Turn assist
- 8 Lane-changing assistant
- 9 Rear-end collision protection



Cameras, ultrasonic sensors, radars, laser scanners—modern vehicles contain at least 40 sensors. Their job is to support safety and comfort in the vehicle. Testing and calibrating them is complicated. TechPRO® Digital ADAS makes it easy. It's ready to start in seven seconds and finished in just two and half minutes. Valuable time saved and top results for the customer.



more important for vehicles. Andrea Lupi is enthusiastic about working with these changing technologies. Every week, he and his team are in contact with 100 to 200 workshops for this purpose, finding out what the vehicle experts need by speaking to them on the phone and making regular on-site visits. "It's often simply a matter of providing information to fill gaps in their knowledge, explaining what mechanics need to be aware of with certain new components or systems," adds Andrea Lupi. People used to say that he and his team weren't afraid to get their hands dirty. But today, Andrea Lupi stands next to a large monitor with a digital diagnostic tool in his hand. It's the prizewinning TechPRO® Digital ADAS, the world's only digital toolkit for repairing advanced driver assistance systems. When MAHLE brought the product onto the market in early March 2019, the phones wouldn't stop ringing—proof that many workshops had been waiting for a product like this. Andrea Lupi explains why: "All newer vehicle models have driver assistance systems. These include radar, cameras, or ultrasonic sensors that help drivers to stay in lane or keep within the speed limit as well as providing other useful support. They're complex systems that need to be recalibrated even when just changing the front windshield." Before TechPRO® Digital ADAS, garages used outdated methods to calibrate highly technical systems. "Index cards, posters, and chalkboards," laughs Andrea Lupi. That's precisely why he and his team developed TechPRO® Digital ADAS—because calibrating new systems using old index cards is not efficient. Andrea Lupi proudly presents the first digital calibration panel, used to adjust radar sensors and cameras in driver assistance systems quickly and accurately. Just then, a vehicle drives up, and Andrea selects the make and model on the diagnostic tool's display, which shows how the vehicle should be positioned in front of the calibration panel. With this simple step, we've already cleared the biggest hurdle—knowing





LUCA GALLIDABINO, Workshop owner, Somma Lombardo/Italy

»To be competitive as a car repair shop nowadays, you need to be up to date and listen carefully to the customer to understand the problem properly. The focus is clearly on the customer.«

how to calibrate this vehicle model. And with the help of updates that are installed automatically via Wi-Fi, this information is always up to date.

### Listening carefully

The digital calibration system is part of the TechPRO® product range from MAHLE Service Solutions. These products are compatible and connected and provide the full spectrum of vehicle diagnostics solutions—all of which are used in the Gallidabino workshop—to read vehicle data and faults, display solutions, and perform diagnostics and coding on components. It sounds as complex as it has now become. Andrea Gallidabino tells us why these digital tools are now indispensable: “When there was a problem in the past, you opened the hood and—broadly speaking—looked at five key components. One of these five would be the cause, and you just needed to know how to repair the part. Today, there are so many components and variables that can be interpreted in different ways that troubleshooting has become very difficult.” Which of course costs too much time. There is also a



# 360-degree service

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*MAHLE goes the extra mile and meets the needs of workshops with its extensive portfolio, services, information, and equipment.*

## Portfolio

150,000 spare parts ranging from engine parts, filters, engine cooling & air conditioning, and turbochargers through electronics and e-mobility

## Information & service

Customer portal, connectivity, how-to videos, Remote Service, easy-to-use service equipment, training, Technical Messenger, e-mail hotlines, practical courses



## Workshop equipment & diagnostics

FluidPRO® automatic transmission flushing units  
ArcticPRO® A/C service units  
EmissionPRO® emissions testing stations  
TechPRO® vehicle diagnostics & TechPRO® Digital ADAS calibration of driver assistance systems  
LogiqPRO® testing solutions

risk that the problem cannot be properly resolved and the customer is unsatisfied. That's why Andrea Gallidabino begins every repair job with a detailed discussion with the driver. "We need to get the vehicle user to explain precisely what's not working properly and what's bothering them." The driver assistance system in particular is a potential source of problems—as well as a great opportunity for any workshop that can solve them. "One of our customers recently found that his car was braking all by itself—whether or not he wanted it to. There seemed to be a fault with the ESP or braking assistance system. The customer had already experienced the problem at least five times before he came to our workshop. He no longer trusted his car, which was a serious problem." A job for TechPRO® Digital ADAS. The Gallidabino garage recalibrated the vehicle's sensor technology, then Andrea took it out for a test drive with the customer. The braking fault was no longer happening. "How did you do it?" says Andrea, quoting the customer. "I explained the calibration procedure and showed him how TechPRO® Digital ADAS works. He returned a week later. It's not normally a good sign for a customer to come back so quickly. But he just wanted to thank us again." Andrea grins. The vehicle manufacturer's workshop, which the customer had visited right at the start, had been unable to clear the fault. Cases like this reassure Andrea that he's doing the right thing by steadily continuing to invest in state-of-the-art workshop equipment.

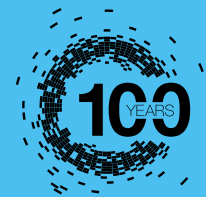
## Thinking ahead, expanding connectivity

When they look to the future, the Gallidabino family and their employees are in agreement: "We can hardly wait to explore and work with new technologies." It's clear to Andrea Gallidabino that it's not just workshops that are changing—so too is the role of the mechanic, who is evolving into an engineer. His mechanics have long since accepted the new educational mission and are continuing their training. As one Andrea speaks, the other nods—Andrea Lupi is already thinking ahead in terms of MAHLE Service Solutions: "Standards will continue to rise in workshops. In the future, their need for innovative equipment, training, and information will grow—and we'll continue to give them proactive support in this process." But whatever the technology of the moment, one thing remains the same for everyone involved: their passion for cars and for solving problems. This passion is embodied in the names Gallidabino and MAHLE. The former for over 50 years, the latter for 100 years—and for a good 150 successful years altogether. ◀



ANDREA LUPI, Technical Services manager, Parma/Italy (right)

»Our strength is being really close to our customers. Being right there in the workshop. So, instead of simply guessing what they need, we know exactly what their requirements are.«



**2018**

MAHLE increases its holding in BRAIN BEE, an Italian workshop equipment specialist, to 80 percent. By doing so, MAHLE is taking another important step toward becoming an integrated solutions provider. The company was founded in Parma/Italy in 2001 and specializes in the development and production of diagnostic tools and software, air conditioning service units, and measuring devices.

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Members of the  
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Members of the  
Group Management Board

The company

# Our self-perception

The MAHLE Group is a leading global development partner to the automotive industry and offers its customers complete systems from a product range that is unrivaled in breadth and depth. Our new developments are geared toward the further optimization of combustion engines and thermal management solutions as well as the expansion of e-mobility. We also want to set new future standards with our innovative solutions by consistently using and expanding our knowledge and innovative strength.

With our strategic orientation, we are addressing megatrends such as population growth, urbanization, globalization, connectivity, or limiting emissions to promote climate protection. We not only see these as an opportunity for further growth, but as an obligation to design our technologies so that mobility on our planet is as environmentally friendly as possible.

The Mahle brothers have bequeathed us a company structure that secures our independence and the long-term orientation of the group. In accordance with their specifications, we want to continue to successfully develop MAHLE as a leading company and attractive employer.

This also means that we stand by our values—fairness, compliant conduct, cultural diversity, and equal opportunities—and live by them every day in our relationships with our employees, customers, and suppliers. Assuming social responsibility was an objective declared by our company founders. We remain bound by this ongoing commitment, and it is reflected in our business decisions. Now and in the future.



# changes

“Nothing is as constant as change.” Even if this saying about transformation is repeated all too often, it has lost none of its relevance. Those who accept this maxim understand change as one thing above all: the creation of a multitude of chances. Chances that we at MAHLE have worked for over the past 100 years—and will continue to work for in the future too. For our customers. For our employees. For the next 100 years.



*doubtless and gentlemen,*

For MAHLE, the year 2019 was marked by numerous challenges. The international markets experienced a downward trend and lost considerable momentum in many places. The transformation of the sector also remains a Herculean task, which is made even more difficult by a political environment that demands a great deal from the automotive industry—when it comes to targets, for example. These must be targets that our industry can rely on, as all those responsible for CO<sub>2</sub> emissions need to be treated equally.

More than anything else, the internal company issues resulting from the deteriorating market situation challenged us greatly and at a personal level in 2019. We took a proactive approach in addressing several particularly demanding tasks, including our cost reduction program and the extensive restructuring of our company. We have defined a large package of measures, some of which have already been implemented. In doing so, we also had to make decisions that were hard for us. Nevertheless, these steps were and remain necessary to safeguard the future of the group as a whole. We have already achieved a great deal, but at the same time we have a challenging path ahead—we must continue to work consistently on the future-proof positioning of the group. We're responsible for more than 77,000 employees. That's why it's essential for us to proceed consistently and sustainably in our business activities and respond at an early stage to signals from the

markets. Only with this approach will we remain a reliable employer and a strong player in the industry.

However, internal change means more to us at MAHLE than simply adjusting the structural and technological orientation of the company. This process of internal change begins with the readiness of the employees who work for and are committed to this company to embrace the change. After all, this transformation will inevitably involve a change in skills too.

With regard to the main key performance indicators for our company, the year under review, 2019, was difficult and challenging for MAHLE as a whole. The significantly declining automotive markets even had an impact on some of our traditional business segments in the form of falling sales. By contrast, many of our future business areas—including our Aftermarket business unit and our Mechatronics division—bucked this trend and developed positively. In total, we generated group sales of EUR 12.0 billion—adjusted for exchange rate effects and changes in the scope of consolidation, this was 3 percent less than in the previous year. The result from business activities amounted to EUR 10 million: in addition to the drop in sales, this was mainly due to special effects, including expenses for restructuring measures and the absence of high one-off income from the previous year. As at the reference date of December 31, 2019, MAHLE employed 77,015 people.

We initiated and drove forward numerous projects and issues again in 2019, thereby enhancing our company's position as a source of inspiration and an innovation driver for new technologies. You'll find some examples of this in the magazine section of this Annual Report. These examples demonstrate one thing above all: even though the transformation in our industry is challenging, the market conditions are difficult, and our restructuring measures are demanding, we're addressing our issues in a focused way, consistently pursuing our strategy, and staying on track. Because in MAHLE's 100<sup>th</sup> year we have one goal in our sights—we want to continue making mobility more sustainable, more efficient, and affordable and thus remain one of the world's leading development partners and suppliers to the automotive industry.

On behalf of the entire Management Board, I would like to thank our employees worldwide. Their skills, creativity, loyalty, and commitment deserve our respect and recognition, especially in these turbulent times. In 2019, we have once again seen a team working with dedication on the

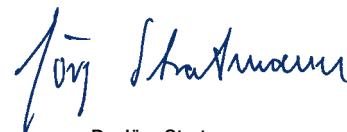
opportunities that have arisen and a focus on results. This level of commitment is especially valuable to our company right now.

My sincere gratitude goes to our customers and partners around the world. Their confidence in us and our close dialog with them have been a source of encouragement and motivation in our actions. We will continue to do our utmost for them in 2020.

I'm very grateful to the MAHLE Supervisory Board, the members of MABEG (Verein zur Förderung und Beratung der MAHLE Gruppe e. V. und stimmberechtigter Gesellschafter), and the employee representatives for their extensive and constructive discussions and excellent cooperation.

It is already clear today that 2020 will be an extremely difficult year: The SARS-CoV-2 coronavirus pandemic will have a significant impact on our business development. To protect our employees, as a response to the global spread of the virus, and in view of the production stoppages at numerous customers, we have taken comprehensive measures. The effects of the coronavirus crisis on our company cannot be fully assessed at present. In addition, the transformation remains our major challenge, which will be accompanied by volatile markets with a further, in some cases severe, decline in global vehicle production.

We know where we need to act and what tasks must be tackled. And we will work tirelessly on these areas in 2020 too. Improving our profitability and thus our result remain our top priorities for 2020. We're also focusing on how best to navigate our company through the coronavirus pandemic. In addition, the successful positioning of our company for the future as well as the safeguarding of our competitiveness are of key importance. We're putting every effort into these issues. We'll continue seizing the opportunities that arise and take on the role of influencer as we drive forward both the mobility of the future and our company. I'd be delighted if you would continue to offer MAHLE your constructive support on this journey.



**Dr. Jörg Stratmann**  
Chairman of the Management Board  
and CEO of the MAHLE Group

# Report of the Supervisory Board

*Vadis and Gentner,*



Whereas in previous years the MAHLE Group has benefited from the overall positive development of the passenger car, commercial vehicle, and off-highway markets around the world, 2019 was dominated by geopolitical uncertainties and threats to international trade, which also had an adverse impact on the group's sales volumes. This situation was compounded by market uncertainties resulting from the politically motivated definition of future CO<sub>2</sub> targets, which likewise had negative consequences for the group's sales and product mix. An open attitude toward different forms of technology and less strict, unbalanced, and one-sided policy-making ought to lead to a recovery in the market in the future.

Furthermore, the sale of a significant holding, which took place in 2018, resulted in a drop in sales from EUR 12.6 billion to EUR 12.0 billion.

Despite an extensive program of savings and efficiencies and the associated staffing level adjustments, it was not possible to prevent the fall in sales—combined with fundamental efficiency problems in certain subareas of the group—from leading to a balance sheet loss at group level of EUR 212 million. Another contributing factor was the provision for the future in the form of high levels of accruals for the reduction of plant and organizational structures that continue to be unprofitable. On the other hand, the establishment of a new Electronics and Mechatronics business unit as of January 1, 2020, has created the conditions for growth with a future-oriented product portfolio. Thanks to high rates of organic growth and additional potential acquisition projects, sales volumes of several billion euro are already on the books for the coming years, which will more than compensate for possible further sales declines in conventional product areas.



Key M&A activities include the complete takeover of the 50 percent participation in BHS (Behr Hella Service GmbH) as of January 1, 2020, and a further increase to the shareholding in the MAHLE Behr Group.

The Supervisory Board has thoroughly discussed and advised on all decisions relating to the group's business development. With a view to a long-term strategy, the Management Board was given the task of developing approaches for the future of the German locations in order to produce products with future potential here as well.

In the 2019 business year, the Supervisory Board met all of its obligatory responsibilities in accordance with the law, Articles of Association, and Rules of Procedure. It held a total of five meetings in the business year, one of which was convened at the request of the employee representatives. The Personnel Committee also met a number of times to examine current personnel issues. In addition, the Chairman of the Supervisory Board and the Chairman of the Management Board consulted verbally and in writing on a regular basis to discuss and agree on strategic and operational matters.

During the year under report, the Supervisory Board was informed regularly, promptly, and comprehensively through oral and written reports from the Management Board and during meetings about the business development of the company, the group, its business units, its profit centers, and its participations.

As of February 11, 2020, shareholder representatives Karin Himmelreich and Thomas Letsch resigned from the Supervisory Board. The Supervisory Board would like to thank Ms. Himmelreich and Mr. Letsch for their constructive participation in the ongoing development of the company. At the shareholder meeting, Dr. Michael Macht and Professor Dr.-Ing. Jörg Zürn were elected to the Board as their successors.

Alongside operational and strategic issues, the implementation of the law stipulating the equal participation of women and men in managerial positions was also discussed in these meetings. The Supervisory Board and the Management Board are both striving to increase the current proportion of women at all levels.

A resolution by the Supervisory Board on July 26, 2019, appointed Martin Weidlich to the Management Board

with responsibility for the Filtration and Engine Peripherals business unit with effect from January 1, 2020. In the Supervisory Board meeting on November 28, 2019, Anke Felder was appointed as the member of the Management Board responsible for Human Resources and as Director of Personnel with effect from January 1, 2020. This follows Michael Glowatzki's resignation as a member of the Management Board and Director of Personnel as of December 31, 2019. Mr. Glowatzki had held this position on the Management Board since mid-2005, and MAHLE is indebted to him for lasting successes and ongoing developments in the group's personnel policy. In another resolution on November 28, 2019, Wilhelm Emperhoff's tenure was extended. He took on the responsibility for the positioning and organization of a new Electronics and Mechatronics business unit as of January 1, 2020.

The appointed auditors PricewaterhouseCoopers GmbH audited the annual financial statements and management reports of the MAHLE Group and of MAHLE GmbH for the 2019 business year, which had been set out in accordance with the German Commercial Code (*Handelsgesetzbuch*, HGB), rendering an unqualified audit opinion. The Supervisory Board agreed with the results of the audit following in-depth analysis of the audit reports and the report from the auditors in the Supervisory Board meeting.

The Supervisory Board approves the annual financial statements and the management reports of the MAHLE Group and of MAHLE GmbH.

The Supervisory Board would like to thank all employees of the MAHLE Group for their commitment to the long-term success of the MAHLE Group.

Stuttgart/Germany, April 28, 2020  
For the Supervisory Board



**Professor Dr. Heinz K. Junker**  
Chairman of the Supervisory Board  
of the MAHLE Group

# Highlights 2019

Interesting topics, exciting projects, unique encounters—2019 had many special moments in store for MAHLE. Here is a small selection.



## STATE VISIT >< DIALOG

Making a pit stop at MAHLE: as part of his official visit to Slovenia, German Federal President Frank-Walter Steinmeier visits our location in Bovec with the President of the Republic of Slovenia, Borut Pahor, to find out about the MAHLE Group's activities in the field of electronics. Dr. Jörg Stratmann, MAHLE's CEO, takes the two guests on a tour of the plant and hosts a discussion.



## ELECTRIC >< SCOOTERS & AUTO-RICKSHAWS

MAHLE increases its holding in the former joint venture MAHLE Letrika Roots India, now MAHLE Electric Drives India, from 50 to 90 percent and further expands its position as a systems provider for alternative drive concepts. MAHLE develops and produces electric traction motors and control units in India for the country's promising new market segments of two- and three-wheelers.



## RECOGNITION >< FOR INNOVATION

At the prestigious CLEPA Innovation Awards 2019, the European Association of Automotive Suppliers recognizes the electric air conditioning compressor from MAHLE, which is the beating heart of the air conditioning and refrigerant circuit in electric vehicles. MAHLE's product prevails in a strong field of 63 competitors to win the prize in the Environment category.



## KEY COMPONENTS >< FOR THE COMPLETE POWERTRAIN

Through the acquisition of the transmission specialist ZG-Zahnräder und Getriebe GmbH, based in Eching, near Munich/Germany, MAHLE is further developing its expertise in the powertrain as a whole and expanding its know-how to include the transmission, a key component. This is significant because the trend in electric vehicles is toward integrated drive systems.



### CHARGING >< WITHOUT THE CABLES

MAHLE embarks on a path toward becoming a supplier of wireless charging technology for electric vehicles and acquires a license package to use WiTricity's magnetic resonance technology.

With this addition to its product portfolio, MAHLE gains a crucial element for the long-term acceptance and expansion of e-mobility.

The solution will enable fast, reliable, and extremely efficient charging—a new technology with strong market potential.



### MEETING CUSTOMER REQUIREMENTS >< THROUGH DEVELOPMENT COMPETENCE

MAHLE bolsters its research and development (R&D) operations in China and plans a technology center in Changshu. This will pool existing and future R&D activities for the combustion engine as well as e-mobility and build up further expertise in systems development. MAHLE has a strong R&D team in China, which develops innovative solutions for its customers and consistently implements MAHLE's dual strategy.



### FROM IDEA >< TO PRODUCT

MAHLE develops an air-conditioned child's car seat in collaboration with a leading manufacturer in the sector. The product is expected to be available from specialist retailers in 2020. The idea behind the innovation was to allow even the youngest passengers to enjoy comfortable temperatures—in every season. To this end, the MAHLE corporate start-up Com4Kids has developed a compact module that is integrated into a child's car seat to provide pleasant warmth in the winter and natural cooling in the summer. There is interest from the wholesale trade, and the response following initial tests is also promising.



### AWARD >< WINNING

In 2019, MAHLE is delighted to receive around 85 awards from customers and partners. These include awards for outstanding quality and for outstanding innovations and technologies.



# A worldwide network— our locations

Around 160 production locations  
16 major research & development centers  
More than 77,000 employees\*

## North America

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**27 PRODUCTION LOCATIONS**  
**16,136 EMPLOYEES\***  
**SALES OF EUR 3,391 MILLION**  
Canada, Mexico, USA

Major research &  
development centers

### EUROPE

Northampton/Great Britain  
Šempeter pri Gorici/Slovenia  
Stuttgart-Bad Cannstatt/Germany  
Stuttgart-Feuerbach/Germany  
Valencia/Spain  
Foetz/Luxembourg

### NORTH/SOUTH AMERICA

Amherst, New York/USA  
Farmington Hills, Detroit, Michigan/USA  
Troy, Detroit, Michigan/USA  
Lockport, New York/USA  
Jundiaí, São Paulo/Brazil

### ASIA/PACIFIC

Numazu/Japan  
Pune/India  
Shanghai/China  
Kawagoe, Tokyo/Japan  
Okegawa, Tokyo/Japan

\* As at December 31, 2019

## South America

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**9 PRODUCTION LOCATIONS**  
**8,391 EMPLOYEES\***  
**SALES OF EUR 630 MILLION**  
Argentina, Brazil



# Europe

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**69 PRODUCTION LOCATIONS**  
**35,336 EMPLOYEES\***  
**SALES OF EUR 5,569 MILLION**

Austria, Belarus, Bosnia and Herzegovina, Czechia, France, Germany, Great Britain, Hungary, Italy, Luxembourg, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Turkey

# Asia/Pacific

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**58 PRODUCTION LOCATIONS**  
**16,161 EMPLOYEES\***  
**SALES OF EUR 2,404 MILLION**

China, India, Indonesia, Japan, Philippines, Singapore, South Korea, Thailand



# Africa

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**2 PRODUCTION LOCATIONS**  
**991 EMPLOYEES\***  
**SALES OF EUR 55 MILLION**

South Africa

# Members of the Supervisory Board

## Prof. Dr.-Ing. Heinz K. Junker Chairman

Former Chairman of the Management Board and CEO of MAHLE GmbH, Stuttgart/Germany

## Uwe Meinhardt Deputy Chairman

Management IG Metall, Director of Department General Policy and Sociopolitical Issues, Berlin/Germany

## Peter Bauer

Member of the Works Council of MAHLE Ventiltrieb GmbH, Zell im Wiesental/Germany

## Rolf Berkemann

Vice President Sales and Application Engineering Passenger Cars 1/Region Europe, MAHLE Group, Stuttgart/Germany

## Dietmar Bichler

Chairman of the Supervisory Board of Bertrandt AG, Ehningen/Germany

## Prof. Dr. jur. Wolfgang Fritzemeyer

Of Counsel at international law firm Baker McKenzie, Munich/Germany

## Gerd Goretzky

Chairman of the European Works Council of MAHLE Group, Stuttgart/Germany

## Josef Häring

Chairman of the Works Council of MAHLE GmbH, plant Rottweil/Germany

## Karin Himmelreich

(until February 10, 2020)  
Managing Director MP Transaction and Partner at MPT Jamieson, Frankfurt/Germany

## Jürgen Kalmbach

Chairman of the Works Council of MAHLE GmbH, plant Stuttgart/Germany

## Dieter Kiesling

Chairman of the Works Council of MAHLE Behr GmbH & Co. KG, region Muehlacker/Germany

## Michael Kocken

Trade Union Secretary of IG Metall, administrative office Stuttgart/Germany

## Prof. Dr.-Ing. Gisela Lanza

Head of the Institute of Production Science at the Karlsruhe Institute of Technology (KIT), Karlsruhe/Germany

## Thomas R. Letsch

(until February 10, 2020)  
Former Vice President Sales and Application Engineering Commercial Vehicles of MAHLE Group

## Dr. Michael Macht

(since February 11, 2020)  
Former Chairman of the Management Board of Porsche AG and former Member of the Management Board of Volkswagen AG

## Dr. Franz-Josef Paefgen

Former CEO of AUDI AG, Bentley Motors Ltd and former President of Bugatti International S.A.

## Prof. Dr.-Ing. Stefan Pischinger

Head of Institute, Institute for Combustion Engines, RWTH Aachen University, Germany

## Uwe Schwarte

Chairman of the Central Works Council of MAHLE Group Germany and Chairman of the Works Council of the MAHLE Filtersysteme GmbH, Stuttgart/Germany

## Annette Szegfü

Spokesperson of Management IG Metall, Frankfurt/Germany

## Dr. Bernhard Volkmann

Former Member of the Management Board and CFO of MAHLE GmbH, Stuttgart/Germany

## Georg Weiberg

Former Head of Global Truck Engineering, Daimler AG, Stuttgart/Germany

## Prof. Dr.-Ing. Jörg Zürn

(since February 11, 2020)  
Former Head of Mercedes Benz Van Engineering, Daimler AG, Stuttgart/Germany



# Members of the Group Management Board

## Dr. Jörg Stratmann Chairman and CEO

Research and Advanced Engineering, Corporate Quality Management, Corporate Planning, Corporate Communications, External Affairs, Legal

Motorsports and Special Applications profit center

Automotive Sales and Application Engineering,  
Aftermarket business unit

## Georg Dietz

Engine Systems and Components business unit

Large and Small Engine Components profit center,  
Environmental Management/Safety at Work for the group

## Bernd Eckl

Thermal Management business unit

Industrial Thermal Management, Compressors,  
and Control Units profit centers

## Wilhelm Emperhoff

(since January 1, 2020)  
Electronics and Mechatronics business unit,  
Corporate Purchasing

(until December 31, 2019)  
Filtration and Engine Peripherals business unit,  
Corporate Purchasing Processes and Methods,  
Corporate MAHLE Production System,  
Mechatronics division, Pumps profit center

## Anke Felder

(since January 1, 2020)  
Human Resources, Director of Personnel

## Michael Frick

Finance, Corporate Controlling, Taxes,  
IT Services, Insurances, Revision and  
Risk Management, Mergers & Acquisitions

## Martin Weidlich

(since January 1, 2020)  
Filtration and Engine Peripherals business unit,  
Corporate MAHLE Production System

### MEMBERS WHO STEPPED DOWN IN THE YEAR UNDER REVIEW

## Arnd Franz

(until March 31, 2019)  
Automotive Sales and Application Engineering,  
Aftermarket business unit

## Michael Glowatzki

(until December 31, 2019)  
Human Resources and Legal,  
Director of Personnel

# Members of the Group Management Board



*From left to right:*  
Wilhelm Emperhoff  
Georg Dietz  
Michael Frick  
Dr. Jörg Stratmann  
Chairman  
Bernd Eckl  
Anke Felder  
Martin Weidlich  
*as at January 1, 2020*





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Committed employees

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Corporate Social Responsibility

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The MAHLE Foundation

# Responsibility

# changes

## Working with our employees to shape change together

One hundred thirty-five years after the invention of the first automobile, our industry is experiencing the most significant period of upheaval in its history.

Whether legal frameworks, technological parameters, the electrification of the powertrain, or even the process of digitalization and the trend toward autonomous driving—changes are prompting a radical structural transformation in our sector. As an employer, this is presenting us with new challenges that must be addressed. Especially in times of transformation, it is essential to take a holistic approach, consisting of targeted personnel marketing and needs-oriented recruitment as well as comprehensive support and training, to ensure the continued ongoing development of the company. MAHLE is committed to motivating and empowering its employees to play an active role in shaping change. That's because our teams make an outstanding contribution to our company's success every day thanks to their knowledge, commitment, and wide range of skills.

### A changing organization

The objective of the Organizational Health Index (OHI) project was to prepare our company for future challenges. In 2018, various action areas aiming to make MAHLE fit for the transformation were derived from the results of the international OHI management survey. Since then, international and cross-functional teams have been working together on different subprojects for the purpose of changing our corporate culture.

In periods of change, it is vital for a global company to have a modern leadership structure—in addition to a clear vision and highly motivated employees. In order to implement a standardized leadership model, new leadership principles were defined as part of the OHI project during the year under review together with employees and managers around the world.

### Employer branding

As an employer, our dual strategy is helping us to position ourselves purposefully on the job market, where we want to get the right talent excited about working for us. In addition to automotive engineering, power engineering, and computer science professionals, our activities are particularly focused on target groups in the fields of mechatronics and electrical engineering. The established E-Mobility Night format was successfully repeated in Stuttgart/Germany in 2019. Around 100 e-mobility experts as well as representatives from the worlds of politics and science attended the event hosted by MAHLE. In between presentations and an exhibition of MAHLE products, the participants had the chance to chat, exchange ideas, and expand their existing networks.

With the launch of our new international HR marketing campaign, we have given MAHLE as an employer a new look. In doing so, we're highlighting what makes us unique: our diversity, our team spirit, and

our motivation to shape the mobility of the future together. At the same time, we've relaunched our careers website with new content and a user-friendly design.

As a notable milestone in our digital employer branding activities, our personnel marketing social media strategy was enhanced with the addition of WeChat in 2019. Until then, we had mainly used the platforms LinkedIn, Facebook, and Instagram. WeChat is the most popular messaging service in China, and its use is helping to position MAHLE as an attractive employer in the Chinese labor market. We're also continuing to develop new formats for our more established social media channels, such as the #MAHLEInstaTakeOver. Using this Instagram format, employees give real insights into their jobs and their day-to-day work. Ten countries have already participated in the popular Instagram format, including Great Britain, Slovenia, and Japan. Currently used by over one billion people, the social media platform Instagram is the fastest-growing digital network and therefore another important channel for our talent communication work.

Our university and college marketing strategy is focused on reaching out to specific groups of students and graduates at an early stage and creating a bond with them. We currently have a relationship with 74 selected key universities in 18 countries worldwide, at which we foster a dialog with professors and students by means of guest lectures, sponsorship activities, and cooperative measures. In Brazil, for example, we invite students at the Federal University of Itajubá to participate in a practical project four times a year, through which we teach them technical skills and give them the opportunity to exchange knowledge with our engineers.

In the context of university and college marketing, we also help 16 student teams from our partner universities around the world to participate in the international engineering competition Formula Student. Here, groups of students compete in race cars they have built themselves. The Formula Student Electric category is a particular area of focus for us.



#### NEW HR CAMPAIGN

Team spirit, innovation, and passion—these are the hallmarks that make MAHLE stand out as an employer worldwide.



Get ready for team MAHLE

Go further, go faster, and be  
#StrongerTogether.





## STRENGTHENING OUR LEARNING CULTURE

We're exploring new ways of passing on knowledge to our employees through our first Learning Meetup@MAHLE on the subject of blockchain technology.



### Recruitment

Centralized recruitment is a proven concept at MAHLE. Since the official launch in January 2018, national Recruiting Centers have been set up in Stuttgart/Germany, Farmington Hills/USA, Tokyo/Japan, Rugby/Great Britain, and Mogi Guaçu/Brazil. The first successes are already measurable: since early 2018, the lead times in the process for filling vacancies have been cut by more than half at some locations. The steady international rollout of the new concept has continued in the year under review. The Recruiting Centers in China, Romania, Poland, and Czechia also opened their doors over the course of the year. By creating a global recruitment network in this way, we'll be able to gain even greater access to synergies that span countries—for the staffing of positions and the ongoing development of MAHLE's talent acquisition strategy.

Active sourcing is a key element of our recruitment concept and was further developed and professionalized in 2019. This strategy primarily involves identifying and proactively approaching potential candidates for open positions via career-related networks, which has the benefit of also attracting the attention

of candidates who aren't actively looking for jobs. We hired many new employees this way in the year under review, and additional candidates are in regular contact with MAHLE as a potential employer. This allows the recruitment team to develop its network and approach the right candidates quickly and according to specific needs when vacancies arise. These activities are being further expanded and intensified with an eye to the future, since those profiles that are needed in future areas of activity are the exact same ones that are in short supply and highly sought-after on the labor market—and can only be reached using active sourcing.

### Corporate training & HR development

The structural transformation taking place in our industry is also changing the skills needed to shape future mobility. Needs-based continuous development and the creation of qualifications as part of a targeted program for advanced training are key components of our HR activities. The overriding goal of this approach is to offer our employees long-term prospects at MAHLE and make them fit for the challenges ahead. That's why we're investing in selected

measures and instruments that support continuous development as well as in vocational training and part-time study courses.

To build up the skills required for the transformation within MAHLE, we launched the Transformation Roadmap qualification initiative. We want to use this training and qualification program to harness and develop the potential of our employees, so that they can be mobilized to work in our future business areas, such as e-mobility. The necessary interdisciplinary and specialist competences were defined in conjunction with the development department and the specialist functions related to development. Using this as a basis, we have expanded the program for advanced training to serve our target groups.

Alongside this initiative, we're exploring new ways of passing on knowledge to our employees through our Learning Meetup @MAHLE event series. This informal cross-functional learning opportunity is also helping to support the transformation. Participants are invited to a keynote presentation by an expert on the latest future topics, followed by a round of discussions. After the success of two such events in Stuttgart, each attended by over 100 visitors, this format will be introduced in other countries in 2020, for example in India.

The structural transformation of the sector is also changing vocational training requirements. An increased need for personnel in the field of e-mobility is resulting in a growing number of trainees and employees on cooperative studies programs in the specialist areas of mechatronics and electrical engineering. Likewise, skilled workers have gained further qualifications as mechatronics specialists in newly established training and further education centers. In 2019, we trained a total of 494 employees in this way in Germany. Globally, 298 trainees in countries such as North America, Poland, Austria, and Mexico completed their initial vocational training in various professional fields.

To foster intercultural skills as well as the personal and specialist continuous development of our employees, we offer the option of international secondment to MAHLE locations in other countries. In the year under review, more than 250 professionals, trainees, and students gained experience working

abroad, developed new outlooks, and were able to further expand their international networks. On-site participation in at least one project abroad is also a significant component of our International Trainee Program. With our global orientation and the wide range of options on offer, we're strengthening the integration of a global mind-set and promoting international knowledge transfer, cultural exchange, and the ability of our workforce to cooperate around the world.

## Diversity & inclusion

We encourage diversity and inclusion in our workforce. The range of skills and talents our employees have make them the drivers of innovative and creative solutions. By signing the Diversity Charter, we have pledged to create a working environment that is free from prejudice. We believe that all our employees should feel valued—irrespective of gender, gender identity, nationality, ethnic origin, religion or ideology, disability, age, and sexual orientation or identity. Inspired by the MAHLE Vision and the motto “Making the WE visible,” a range of locations in 21 countries celebrated this year's annual Diversity Day with global and local activities. The goal was to highlight diversity at MAHLE and allow everyone to experience it through various measures, including a global selfie campaign, interactive walls, and a lunch roulette session. The day was a great success: in addition to numerous contributions from our employees—including staff in China, Japan, Romania, and India—our Diversity Day activities won second place in the Diversity Charter's “Best campaign” category. Through these actions, we're encouraging our employees to bring their diversity to bear in the company.

Supporting the advancement of women through worldwide initiatives is one focus of our diversity activities. Our established Women@MAHLE networking lunch gives all the participants the opportunity to engage in valuable face-to-face dialog. On International Women's Day, the company called attention to the issue of equal rights for women in society and in working life. In India, for example, a workshop with a registered health and nutrition professional was organized on the subject of women's health. A promotional video was also shared on our social media channels.

As part of our diversity management work, we offer various additional services geared to individual locations through our MAHLEforME initiative with the aim of improving work-life balance. Our extensive range of services includes—but is by no means limited to—childcare, au pair referral, advice and support relating to nursing care, and helping to arrange household or laundry services. We also offer a variety of adjustments and models to support flexible working to ensure that our employees are able to arrange their work to suit their individual and changing needs. With MAHLEforME health days, a breast cancer awareness campaign in the USA, and company sports teams, health interventions are part of the program too. One highlight was the MAHLEforME Sport Challenge, which took place throughout

June. The activity competition was initiated by our three locations in Poland—Ostrów, Krotoszyn, and Wrocław—to motivate our staff to join in with sports activities. Many sports fans from Germany, Canada, Mexico, Slovakia, Czechia, and the USA took part in the international contest.

At MAHLE, diversity is a strategic factor in our success. That's why we encourage our managers in particular to bring together people with different talents and make positive use of differences, so that all employees feel welcome at our company. We nurture a corporate culture characterized by mutual respect and appreciation. We work to create an environment in which managers and employees alike can recognize, share, and practice these values together.



#### DIVERSITY DAY

Diversity Day was celebrated by MAHLE around the world with a host of measures, including a selfie campaign.



# Corporate Social Responsibility

As a company that operates internationally, we accept our responsibilities—toward the people who work for us and with respect to the impact of our operations on the environment and on society. At MAHLE, corporate activities and social engagement go hand in hand. Through resource-efficient technologies, sustainable product solutions, and modern production processes, we are working to steadily reduce the pressure on people and the environment. And we want to keep on improving every day.

## **Sustainability management at MAHLE**

Sustainability is part of our identity. We believe that one of our most important tasks is to harmonize our corporate success with the well-being of people and the environment. Consequently, we always aim to incorporate the environmental and social considerations alongside the economic factors in our decision-making. The principles that guide our actions are ethically correct and lawful conduct, the satisfaction of our employees, with particular regard to their health, the safety of their workplaces, the protection of the environment and resources, and the establishment of a positive working environment.

The task of sustainability management is to use materiality analyses to identify sustainability aspects relevant to our business activities and initiate optimizations based on this information.

## **Responsibility toward our employees**

We work to ensure the well-being of our employees. To achieve this, we need workplaces that do not pose a risk to the health of our staff. It is our responsibility to make the working conditions at MAHLE as safe as possible. We act within the framework of our Health, Safety, and Environment (HSE) guideline.

## **Focusing on safety at work**

With its Golden Safety Rules, MAHLE has developed and is consistently implementing safety at work principles that apply throughout the group. The three rules, Safety First, I Care—We Care, and Walk the Talk, indicate that safety is always the top priority, that it is the responsibility of every individual, and that the company consistently pursues the continuous improvement of workplace safety. Since the introduction of the new ISO 45001 standard for safety at work in 2018, we have been working to bring those locations already certified in accordance with OHSAS 18001 into line with the new standard. By 2023, we aim to obtain certification to ISO 45001 standard for the locations that have not yet been certified.



### Accident numbers continue to fall

We measure progress with regard to safety at work using the accident rate, which records accidents involving at least one day of absence per million hours worked. The accident rate in the 2019 business year was 4.8 percent, which was 16 percent lower than in 2018. It has therefore fallen significantly for the third consecutive year.

### Safety initiatives to raise employee awareness at numerous MAHLE locations

An awareness program focused on behavioral workplace safety at our engine systems and components plant in Itajubá/Brazil is one example of how we are promoting safety at work at our locations. The goal of this initiative is to minimize the number of behavior-related accidents. Managers regularly encourage employees to observe their own behavior and that of their colleagues with respect to compliance with regulations on safety at work. The observations are then analyzed and opportunities for improvement

identified as part of mutual feedback meetings. Special training sessions and workshops took place to support this activity and foster the required feedback culture.

The increased focus on safety at work continued at our engine components plant in Ramos Arizpe/Mexico in the last business year. The location built on the safety at work management system, certified in accordance with the international standard OHSAS 18001, by carrying out several measures aimed at raising employee awareness. The goal is to increase the sense of self-responsibility among employees in terms of safety at work. For example, all employees evaluate their own workplaces as part of the risk assessment process in order to highlight potential safety hazards and develop specific measures to combat them. Besides the further optimizations to machine safety and personal protective equipment, these also include improvements to workplace ergonomics. The opportunities for improvement identified in this way are also assessed with a view to their potential transfer to other processes and areas.

To encourage our plants in their efforts with regard to safety at work, MAHLE has presented the Safety



Excellence Award since 2017 to plants that have made outstanding achievements. In 2019, the prize went to our filter systems plant in Pune/India. This plant has not had a single occupational accident in the last 2,300 days, which is more than six years. The keys to this success included regular internal safety audits carried out by managers from various management levels and the active participation of the employees in assessing dangers and risks in their working environments. At the same time, in-house motivational programs further increased awareness of the issue at the plant.

### Responsibility toward the environment

One of our most important tasks is to harmonize our corporate success with environmental protection. Our goal is to reduce as far as possible or completely prevent any environmental impact caused by our business activities. To achieve these objectives, we

follow the standards set out in ISO 14001 and the EU Eco-Management and Audit Scheme (EMAS). Protecting resources is an essential element of our environmental management system.

### Energy management as a key component of environmental management

As a producing company with a high real net output ratio, the energy consumption at MAHLE's locations is a pivotal consideration. Smelting, casting, and plastics processing operations—primarily injection molding—are among the particularly energy-intensive production processes at MAHLE. Our goal in 2020 is to continue reducing our energy intensity—energy consumption as measured against sales—by 2 percent with the same production structure. We aim to keep on lowering our CO<sub>2</sub> emissions by increasing our energy efficiency, purchasing energy from renewable sources, and potentially producing our own renewable energy.



### SAFETY FIRST AT MAHLE

At MAHLE's location in Izmir/Turkey, there were no occupational accidents or work-related injuries for 1,000 consecutive days—a run duly celebrated by the team.





### SAFETY EXCELLENCE AWARD

MAHLE's team in Pune/India was delighted to receive the Safety Excellence Award. MAHLE presents this prize in recognition of special achievements in safety at work and prevention.



### Social engagement

At MAHLE, engagement with society and the assumption of social responsibility are integral elements of our corporate culture. For this reason, we have been funding numerous projects and initiatives in the vicinity of our locations around the world for many years. This voluntary engagement is particularly focused on the issues of social interaction, education, the environment, and the fight against poverty and disease. The driving force behind these efforts is our workforce, with our employees also contributing toward the well-being of others outside of working hours. As well as supporting and funding certain long-standing initiatives and institutions, MAHLE regularly organizes additional campaigns to address acute problems.

### Engagement of MAHLE employees in good causes

Our employees are also engaged for the benefit of society outside of the workplace on MAHLE's behalf. For a whole year, employees from various locations in Mexico collected plastic lids from drinks bottles. These lids were recycled, and the proceeds from the raw materials were donated to the nonprofit Fundación Tapitas, which is dedicated to treating children with cancer.

Every year, the employees at our plant in Balasagyarmat/Hungary select three projects that merit support. In a centrally organized poll, each employee can cast their vote for a project of their choice. In 2019, a playground was built nearby and play



## VOLUNTARY ENGAGEMENT

Our colleagues in Balassagyarmat/Hungary constructed a playground for local children.



equipment purchased in cooperation with the local community and with the assistance of ten MAHLE employees.

On Environment Day in Romania, a team of 20 employees from MAHLE's location in Timisoara took part in "Make it! Race it! Recycle it!"—an environment themed race on the local Bega river. The main goal of the event was to highlight the issue of waste in general and promote recycling as a solution. The team designed and built a boat entirely from recyclable materials and successfully participated in the competition.

### Giving to people in need

Together with our staff, we help struggling families, children, and numerous other people in our society. Our employees at many MAHLE locations around the world spread joy and raised a smile during the Christmas season. Our Christmas campaign meant we were able to make 432 wishes come true for socially disadvantaged people in the Stuttgart region

of Germany. In Korea, a sum of around EUR 1,600 was donated toward the medical care of a resident in a social welfare institution. Our locations in the United States were busy too: employees in Farmington Hills, Michigan, collected gloves for people in need; in Lockport, New York, they put together gift packages for aid organizations; and in Troy, Michigan, they donated toys to needy children.

In a major fund-raising campaign by our colleagues in the US, employees from eight MAHLE locations gave USD 50,000 to the charitable organization United Way. The plant in St. Johns also donates annually to local foundation Relay For Life of St. Johns University and was able to help people in need again this year with a gift of over USD 35,000.

Our location in Samut Prakan/Thailand organizes a workplace blood donation drive every three months. Ten percent of MAHLE employees participated in 2019. In addition, the location donated essentials, food, and children's toys to assist the victims of the catastrophic floods in northeastern Thailand. Employees from MAHLE's location in Bangkok also



actively helped their fellow citizens. In the past year, our teams supported a nearby kindergarten by spending time with the children, teaching them, and presenting them with gifts.

### Commitment to education

Our locations in South Africa regularly support good causes in the region. This year, they decided to donate a percentage of their annual net income to charity. In the year under review, they donated over 1.8 million South African rand to the organizations Centre for the Advancement of Science and Mathematics Education and Focus on iThemba to fund the education of children in South Africa.

MAHLE is also engaged in education projects through the involvement of individual employees, who help to prepare children and young people for the professional challenges of the future. In Durban, schoolchildren and students from 15 primary school teams and 15 high school teams took part in a multi-disciplinary challenge set by our employees at MAHLE in Durban. The teams' task was to develop, make, and test a miniature race car powered by

compressed air in the same way that Formula 1 cars work. To race successfully, the teams had to get to grips with physics, aerodynamics, design, manufacture, branding, marketing, and sponsorship—while also learning important lessons in leadership and teamwork. MAHLE employees supported them as mentors over several months. On a plant tour of the location itself, the teams had the opportunity to gain insights into the state-of-the-art production of vehicle parts.

### Numerous employee-led volunteer initiatives

Through our high degree of social engagement, we are involved in many initiatives on a voluntary basis around the world. The charitable projects, donations, and fund-raising campaigns outlined here are often instigated on our own initiative and represent just a selection of MAHLE's activities.

The MAHLE Management Board would like to thank all the dedicated helpers for this outstanding commitment.



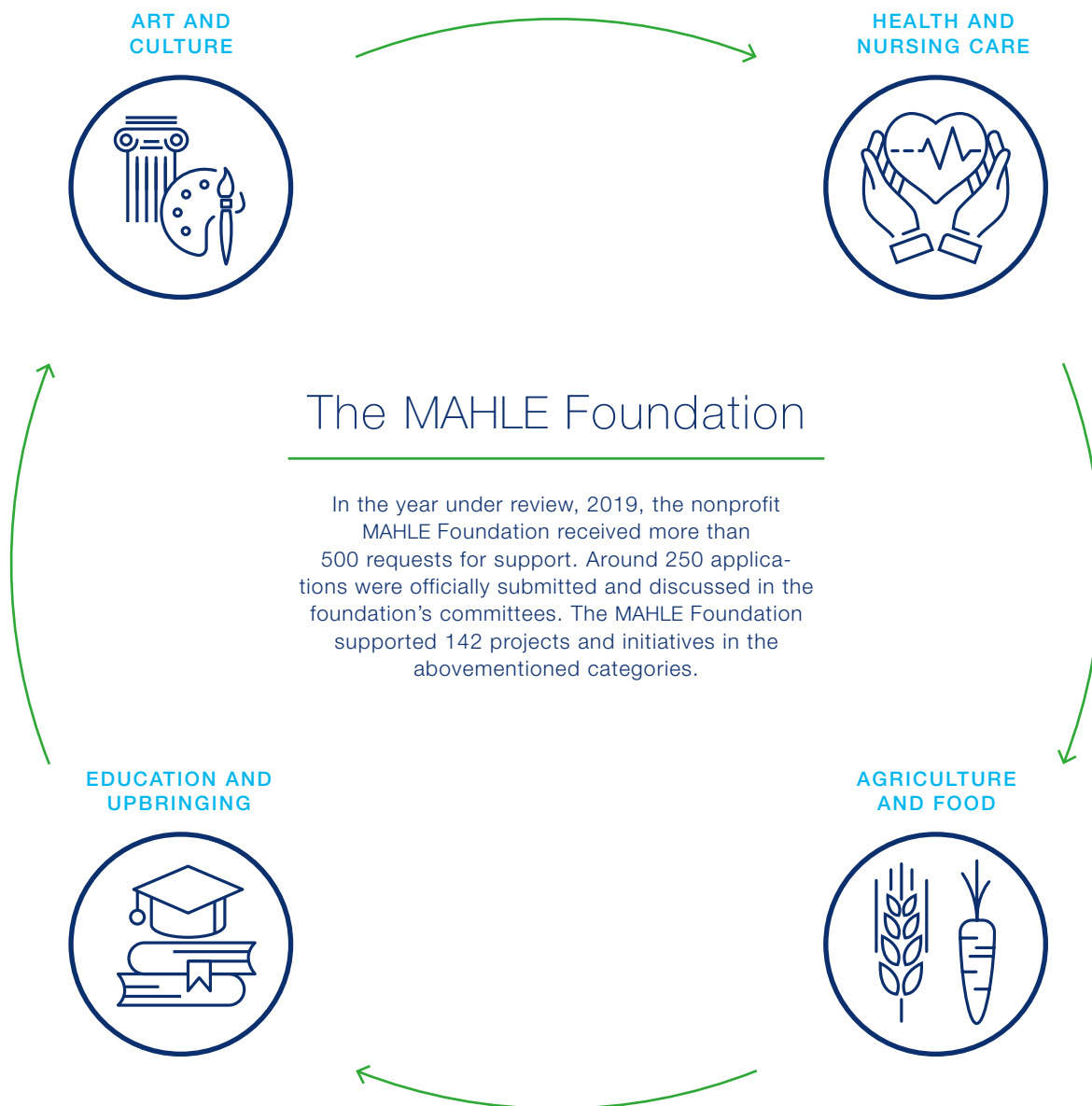
### CHRISTMAS CAMPAIGN

Many countries and locations saw the festive season as an opportunity to spread a little joy to others.



# Creating chances for a better future together—the work of the MAHLE Foundation

In 2019, the MAHLE Foundation supported more than 140 projects in the fields of health, education, art, and food, opening up real chances for people. We present a selection of the projects funded.



## Health and nursing care

One of the MAHLE Foundation's funding priorities is "health and nursing care," a category that supports numerous projects, including those involving anthroposophical medicine. In 2019, for example, the MAHLE Foundation continued to fund the work of the Filderklinik near Stuttgart/Germany, which is a member of the Kompetenznetzwerk Integrative Medizin. This competence network is an alliance of nine renowned clinics and hospitals in southern Germany and aims to promote an integrative approach to medicine. "The Kompetenznetzwerk acts as a bridge between conventional medicine and integrative medicine. The network is thus intensifying dialog among medical professionals and combines both approaches to a high standard," explains Jürgen Schweiß-Ertl, managing partner of the MAHLE Foundation.

A special congress was held in Stuttgart's city hall in October 2019 with the objective of initiating a strong dialog and lively discussion on issues relating to pregnancy, birth, and early childhood. Entitled "WIR – von Anfang an" (together from day one), the congress was aimed at gynecologists, pediatricians, midwives, as well as parents and aspired to establish

and develop networks between the various stakeholders, to improve cooperation between the different specialisms, and, above all, to strengthen the parents' trust. With the support of the MAHLE Foundation, those who attended the congress had the opportunity to participate in numerous specialist lectures, keynote presentations, and discussions, to talk about challenges, and to seek solutions in five forums: Pregnancy, Birth, Premature Birth, Teamwork from Day One, and Parenting Skills.

## Agriculture and food

For decades, the MAHLE Foundation has devoted itself to projects within the scope of the "agriculture and food" funding priority that promote biodynamic farming. In 2019, for example, the MAHLE Foundation provided funding for a dairy cattle practitioners' day at the biodynamic Rengoldshausen estate near Überlingen/Germany. Through specialist lectures and experience reports, the participating dairy farmers and technical consultants were able to obtain information about real-life, practical issues such as pasture management, soil fertility, and breeding for lifetime production and deepen their knowledge in advanced seminars.



### CATTLE PRACTITIONERS' DAY

Dairy farmers and technical consultants catch up on practical issues such as pasture management or breeding for lifetime production at the biodynamic Rengoldshausen estate near Überlingen/Germany.





### PROJECT: MANEGE DER KULTUREN

Refugee children and young performers practice acrobatic tricks, learn to juggle, and rediscover the joy of movement.



### Education and upbringing

In the “education and upbringing” funding category, the MAHLE Foundation supported a wide range of interesting projects in 2019. Take, for instance, the second lecture series initiated and organized by the MAHLE Foundation in cooperation with the StadtPalais museum and Stuttgart’s cultural office. Entitled “How we became who we are. Swabian spirit of ingenuity? Inventors, researchers, and scholars in Württemberg,” the event series addressed key questions, including: How was the Stuttgart region of Germany, at one time a poor agricultural area without any notable riches or mineral resources, able to develop into one of Europe’s most important business locations? What made this development possible? Renowned figures from the fields of culture, science, and religion explored these questions as part of the event series. The panel discussion on the subject of “Corporate versus start-up culture” in particular was very well received by the audience. Here, Dr. Jörg Stratmann, MAHLE’s CEO, discussed the opportunities and limitations of start-ups and traditional companies with Adrian Thoma, CEO of Stuttgart-based start-up Pioniergeist. “Dr. Stratmann related many exciting and interesting stories about MAHLE and familiarized the audience with the company’s diverse fields of activity and its broad range of products in a lively exchange. The audience response was overwhelmingly positive,” says Jürgen Schweiß-Ertl, summarizing the successful event.

How can we establish a sensible and “healthy” relationship with new media? Professor David Martin

and Dr. Silke Schwarz from Witten/Herdecke University launched the Media Fasting project in conjunction with Berufsverband der Kinder- und Jugendärzte, the professional association representing Germany’s pediatricians, and other experts, with the support of the MAHLE Foundation. “It’s a meaningful and exciting project, which—rather than banning electronic media—is much more interested in taking a mindful approach to this technology,” stresses Jürgen Schweiß-Ertl. As part of a pilot project run in 2019, the initiators developed a media fasting program and established a scientifically evaluated basis for the ongoing development of the concept with a range of opportunities for target groups like kindergartens and schools. In the initial phase, 1,500 families took part in the pilot project.

The MAHLE Foundation has been an active supporter of Waldorf, or Steiner, education for many years. This pedagogic approach, based on anthroposophy, has its origins in Stuttgart. It was here that Rudolf Steiner cofounded the first Waldorf school in 1919, setting in motion the idea of a new form of education. To mark the centenary of Waldorf educational philosophy, numerous events took place across Germany. One of the highlights of the anniversary year was a celebration in Stuttgart’s Liederhalle events and conventions center, attended by figures from the worlds of science, culture, and politics. The organizers also hosted a major education conference with 600 Waldorf teachers from around the world. The MAHLE Foundation assisted and supported both events.



## Art and culture

Building friendships and connecting people through music—these are the goals of the “Musik verbindet” project by the Figure Humaine chamber choir, funded by the MAHLE Foundation. This musical connection is evident not only in the chamber choir’s Franco-German musical repertoire, but also in the ties of friendship between the choir members. Figure Humaine aims to convey friendship and humanity to its concert audiences, uniting them for a moment through music.

Young performers teach circus skills to refugee children and young people—that’s the idea behind

the Manege der Kulturen project, begun in 2015. The advantage of this scheme is that training together doesn’t require a shared language, so potential barriers are overcome through nonverbal communication. Refugee children and adolescents practice acrobatic tricks, learn to juggle, and rediscover the joy and fun of movement through physical effort. The project—inspired by Waldorf philosophy—places a particular focus on the young people’s state of mind. With the support of caregivers who have been well trained in trauma-informed education, the young refugees are better able to process the suffering and terror they have experienced. In 2019, the project was awarded the ninth Stuttgart Citizens’ Prize and received support from the MAHLE Foundation.



### PROJECT: MUSIK VERBINDET

The chamber choir Figure Humaine aims to connect people through music and through its project.



### THE MAHLE FOUNDATION: GUARANTEEING INDEPENDENCE

MAHLE-Stiftung GmbH (the MAHLE Foundation) holds 99.9 percent of the MAHLE Group’s shares. Every year, it receives a dividend, which it uses to finance its funding projects. The nonprofit foundation thereby guarantees that MAHLE is able to remain an independent company. This ensures that the majority of the group’s net income for the year is reinvested in the MAHLE Group. MABEG e.V. (Verein zur Förderung und Beratung der MAHLE Gruppe e.V.) exercises the voting rights at MAHLE GmbH shareholder meetings. Since its inception over 50 years ago, the MAHLE Foundation has supported and sponsored more than 5,000 different projects and initiatives.

# Group management report

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**OUTLOOK**



“MAHLE—We shape future mobility”—our Vision is our compass. We strive to make mobility even more efficient, environmentally friendly, and comfortable.



We operate around 160 production locations and 16 research and development centers around the world, giving us a presence on every continent.



Our dual strategy is our guiding principle. It stands for innovations in alternative powertrain technologies while simultaneously optimizing the combustion engine.

# Fundamental information about the MAHLE Group

## Business activities and corporate structure

MAHLE is a leading global development partner and supplier to the automotive industry. As a technology pioneer for the mobility of tomorrow, we are committed to making transportation more efficient, more environmentally friendly, and more comfortable. That is why we are pushing forward the worldwide introduction of alternative drive concepts, thus laying the foundation for the widespread acceptance of e-mobility. At the same time, we are optimizing the combustion engine and advancing the use of alternative fuels.

Encompassing engine systems and components, filtration, and thermal management, our product portfolio addresses all the relevant issues relating to the powertrain and air conditioning technology as well as their combination. Thanks to our high level of systems competence and our expertise in electric and electronic components and systems, we can also offer integrated systems solutions for e-mobility.

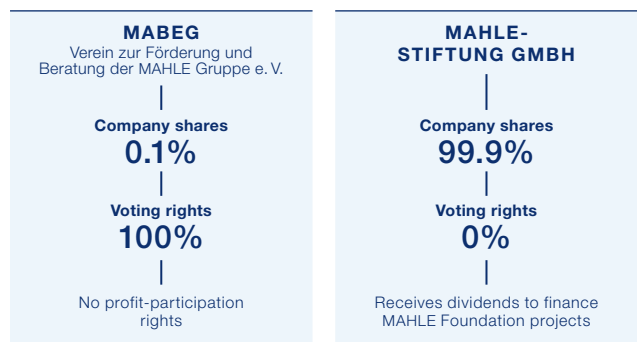
MAHLE products are fitted in millions of passenger cars and commercial vehicles. And that is not all: for decades, our components and systems have also been used off the road—in stationary applications as well as for mobile machinery, rail transport, and marine applications.

The MAHLE Group is organized into four business units: Engine Systems and Components, Filtration and Engine Peripherals, Thermal Management, and Aftermarket. Added to this are the Mechatronics division and six profit centers, which serve specific market and customer segments.

We took advantage of the chances presented by globalization at an early stage and enhanced our product portfolio by strategically founding and acquiring new business activities. With our around 160 production locations and 16 major research and development centers, we are represented on five continents and employ approximately 77,000 people overall.

The nonprofit MAHLE Foundation controls 99.9 percent of the company’s shares; 0.1 percent of the shares are held by Verein zur Förderung und Beratung der MAHLE Gruppe e. V. (MABEG), which also holds all of the voting rights and thus exercises the shareholder rights. This structure ensures our entrepreneurial independence, which creates the basis for long-term planning and farsighted investment decisions.

### OWNERSHIP STRUCTURE OF THE MAHLE GROUP





## MAHLE GROUP

Sales: EUR 12,049 million  
Headcount: 77,015

BUSINESS UNITS				DIVISION	PROFIT CENTERS
<b>Engine Systems and Components</b>	<b>Filtration and Engine Peripherals</b>	<b>Thermal Management</b>	<b>Aftermarket</b>	<b>Mechatronics</b>	Engineering Services, Motorsports, and Special Applications
					Large and Small Engine Components
					Pumps
					Industrial Thermal Management
					Compressors
					Control Units
Sales: EUR 2,617 million Headcount: 26,482	Sales: EUR 2,092 million Headcount: 10,437	Sales: EUR 4,556 million Headcount: 22,850	Sales: EUR 950 million Headcount: 1,731	Sales: EUR 492 million Headcount: 4,771	Sales: EUR 1,342 million Headcount: 10,744

As at December 31, 2019

A core management tool for our group is our operating result—a key figure similar to EBIT. The main differences compared with EBIT lie in the amortization of goodwill, the depreciation and amortization of hidden reserves, which are disclosed in purchase price allocations, and in the treatment of income from the sale of business activities.

## Business segments

### Engine Systems and Components business unit

The Engine Systems and Components business unit is a mainstay of our business and represents one of our core fields of expertise. We have decades of development and systems know-how and are the global market leader in many product groups. Our range of products, which we manufacture at various locations around the world, includes steel and aluminum pistons, piston rings, cylinder liners, bearings, and valve train systems. These products are used around the globe in passenger cars, commercial vehicles, large engines, and two-wheeled vehicles. We are continuously developing our portfolio, focusing in particular on reducing energy consumption as well as CO<sub>2</sub> and other emissions from combustion engines.

### Filtration and Engine Peripherals business unit

We are one of the global market leaders in many product groups in this area. In this business unit, we produce filter systems and components for the engine periphery with the aim of using our products to improve air cleanliness while also preventing contaminants in oil and fuel from damaging engines, in turn increasing their efficiency and service life. In recent years, we

have worked in close cooperation with our customers to develop a modular system for all the major product groups—after all, the product environment can vary significantly, even in identical basic engines. In addition, the production of special high-strength plastics has made it possible to replace metals, thereby achieving further weight savings. For example, we are developing all-plastic oil filter modules with fully integrated oil pumps and oil cooling technology for use in the powertrains of electric vehicles.

### Thermal Management business unit

Our solutions from the Thermal Management business unit for batteries, fuel cells, power electronics, and electric drives make extended cruising ranges, high levels of efficiency, and long service lives possible. We are thus contributing to the development of zero-emissions powertrains. Thermal management is also becoming more and more important in the ongoing development of the combustion engine: Our increasingly effective and efficient cooling systems are helping to cut fuel consumption and thereby reduce CO<sub>2</sub> emissions. Our air conditioning innovations are laying the foundations for new design concepts for interiors and enabling a high degree of thermal comfort for vehicle occupants. In combination with powerful mechanical and electric compressors and electric auxiliary heaters in the overall automotive air conditioning system, this is leading to decisive advantages in terms of consumption and, more specifically, range. In the thermal management sector, we are one of the largest suppliers on the world market.

## Aftermarket business unit

Our Aftermarket business unit supplies wholesalers and automotive workshops all around the world with spare parts in original equipment quality as well as service units and services. In addition to our standard spare parts, such as engine components, filters, turbochargers, and mechatronic components, we are increasingly offering products for thermal management, for example, thermostats, radiators, charge air coolers, and air conditioning compressors. To continue the expansion of this important product segment, we acquired the majority shareholding in the joint venture Behr Hella Service (BHS) on January 1, 2020, and are now offering our customers an even broader product range.

Vehicle diagnostics, exhaust gas analyzers, and service equipment for maintaining HVAC modules and automatic transmissions are also important elements of the MAHLE Aftermarket portfolio, which is completed by services, such as technical support via our global network, customer training, and service information. In view of the diversity of today's vehicle technologies in the fleet, innovative and solution-oriented support is a key building block in our business partners' success. That is why we aim to continue expanding our competences, services, and product areas and to position ourselves as a full-service provider. At the same time, we offer adaptive product management, fast and reliable logistics processes, strong brands, and fair market prices. We are thus able to provide our customers with individual repair solutions and further improve workshop efficiency.

## Mechatronics division

The demand for electric passenger cars and commercial vehicles is steadily rising, a situation that means the portfolio offered by our Mechatronics division is gaining ever-greater importance with products including electric drive systems, actuators, auxiliary aggregates, and control and power electronics. Our activities in this area are founded on our expertise in the development and manufacture of electric motors and of electronic and mechatronic systems. In the year under review, we succeeded in entering the field of passenger car high-performance electronics with a highly integrated on-board charging system for battery electric vehicles and plug-in hybrids. At the same time, we are working with our customers to develop competitive concepts for traction inverters. However, our areas of competence extend beyond the bounds of the strictly automotive sector. For instance, we also supply electric drives for nonautomotive applications, such as for forklift trucks and golf carts. With the introduction of new systems for electric racing bikes, gravel bikes, and city bikes, we have also set a benchmark in the market for two-wheeled vehicles and, with a customer for e-scooters, we have entered the Indian market.

## Profit centers

Six business fields serving special market and customer segments are organized as profit centers: Engineering Services, Motorsports, and Special Applications; Large and Small Engine Components; Pumps; Industrial Thermal Management; Compressors; and Control Units. This structure allows us to offer our customers a high degree of flexibility as well as tailor-made applications and components, meaning we are able to give them targeted support in the development of specific new products.

## Group strategy

Our group strategy is based on the analysis of relevant megatrends, which we have used to develop various future scenarios. Five trends are having a particularly powerful impact on the automotive industry:

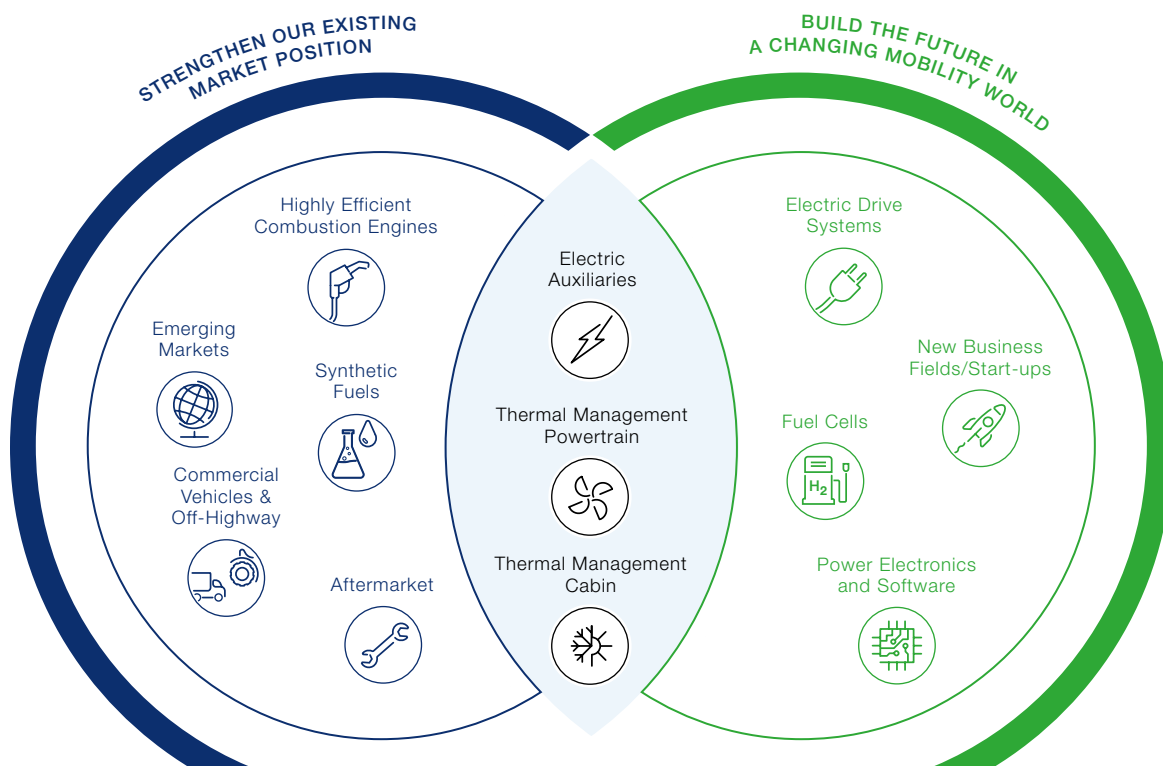
- Climate change (including the political climate targets)
- Advancing urbanization
- Global population growth
- The increasing importance of Asia as an economic region
- Digitalization

These developments demand innovative mobility solutions and present the automotive industry with new challenges. In addition to the expansion of car-sharing options and public transport, the increasing electrification of the powertrain, the growth in digital networking of vehicles, and autonomous driving are taking center stage. Digitalization is playing an ever-greater role, and not only on the roads, but also in our internal company processes, through subjects such as Industry 4.0, big data, and process automation. What's more, these megatrends go hand in hand with changes within our customer landscape, for example, due to new suppliers of electric vehicles or new digital business models.

How quickly this structural change takes place will depend on which technical solutions will hold their ground in the market and, more and more, on political demands. The importance of technologies such as hybrid or electric drives is growing for passenger cars and light commercial vehicles in urban distribution transport, as are alternative usage models like car sharing. The combustion engine will remain significant for medium-sized and heavy-duty commercial vehicles in the short and medium term, but alternative drive types such as hybrid, electric, and fuel cell drives are becoming more important and complementing existing technologies in this area too. Overall, we expect the combustion engine to remain a key element of mobility in global markets both for passenger cars and for commercial vehicles.

MAHLE has derived its dual strategy on the basis of these assumptions and findings:

1. Strengthen our existing market position: From a technology perspective, we would like to play a leading role in the ongoing development of the combustion engine and ensure the highest possible level of competitiveness in terms of quality and costs. In the process, we will primarily concentrate on exploiting further CO<sub>2</sub> savings potential with regard to friction, thermal management, and the air pathway. We believe that the use of synthetic fuels presents even greater potential for reductions in CO<sub>2</sub> emissions, which is why we are consistently adapting our product portfolio to suit their use. By doing so, we are offering our customers solutions that are consistent with current and future legislation and making a significant contribution to reducing emissions.



2. Build the future in a changing mobility world: At the same time, we will push ahead with the development of innovative solutions and products for alternative powertrain technologies and expand the affected business segments. Business segments that are independent of the OEM business for passenger car combustion engines are today already accounting for more than 50 percent of our group sales. We intend to further increase this share on a consistent basis.

Our dual strategy is also reflected in our thermal management activities. Overall, the importance of efficient thermal management will continue to grow—not only in conventional but also in alternative drive systems. In recent years, we have already systematically expanded this business segment for this purpose, developing and marketing many thermal soaking innovations—both for the interior and for the powertrain, including the battery. We will continue to pursue this innovative approach resolutely.

We will substantially amplify our activities in electronics and mechatronics over the years ahead. The organizational merger of core competences from these fields into the new Electronics and Mechatronics business unit as of January 1, 2020, underlines the importance we attach to this area. By taking this step, we plan to increase our extensive competence in electronics with the aim of offering our customers even better systems solutions for electric vehicles with regard to thermal management and the

powertrain. Our customers in Asia in particular prefer solutions of this kind. Furthermore, we intend to expand our portfolio for electric motors in passenger cars and commercial vehicles as well as in two-wheeled vehicles, which are playing an ever-greater role in urban mobility around the world.

We are pursuing a holistic approach in terms of both the development of solutions for alternative powertrain technologies and the optimization of the combustion engine. It is not only the electric motor that is decisive for efficiency in an electric vehicle, but also the interplay of various technologies. This is demonstrated by the example of MEET (MAHLE Efficient Electric Transport), our vehicle concept for future urban mobility. Commercial vehicles also benefit from the combination of different technologies. For instance, a combustion engine's entire system can be operated even more efficiently by using systems designed to recover heat from exhaust gases.

As part of our dual strategy, we review our portfolio as well as the strategic direction and economic performance of the group on an ongoing basis. One of our strategic goals is to evenly distribute sales across our core markets of Europe, North and South America, and Asia/Pacific—giving special attention to the Asian growth market. We consider our global presence to be an important prerequisite for proximity to our customers and for developing innovations in line with the demands of the individual markets.



Compared with the previous year, our sales declined organically by 3.0 percent, but developed more favorably than the market.



The result from business activities fell sharply, mainly due to special effects.



With our Performance Lift program, we aim to achieve a sustained increase in profitability.

# Report on economic position

## Economic conditions

### Overall economic development

According to the January report by the International Monetary Fund (IMF), the global economy grew by almost 3 percent in the year under review, thus showing a weakening in the rate of growth in comparison with 2018. Economic activity in industrial nations and in the emerging markets and developing economies lost considerable momentum. IMF cites as the cause the risks and uncertainties that rose significantly in 2019, among them trade policy restrictions and geopolitical tensions as well as structural problems, such as demographic change in advanced economies.

Economic growth in the euro zone was a good 1 percent. By way of comparison, growth was still almost 2 percent in 2018. Even in France and Germany—the two largest European economies—the growth rate has fallen owing to lower exports and declining industrial production. However, the persistent level of high demand, the positive employment situation, and the expansive monetary policy of the European Central Bank had a stimulating effect on the economy.

Economic activity also weakened in the United States in the period under review, with growth here slightly above 2 percent. Although the labor market continued to appear robust, trade disputes with China and the European Union impaired the US economy. In our important South American market of Brazil too, the rate of economic growth was around 1 percent below the previous year.

In the Asia/Pacific region, the Chinese national economy continued to grow comparatively strongly in 2019, but, with growth of somewhat more than 6 percent (previous year: 6.6 percent), the market has continued to lose momentum—also as a consequence of the trade war with the USA. With an increase of 1.0 percent, economic output in Japan was above the previous year's level (previous year: 0.3 percent).

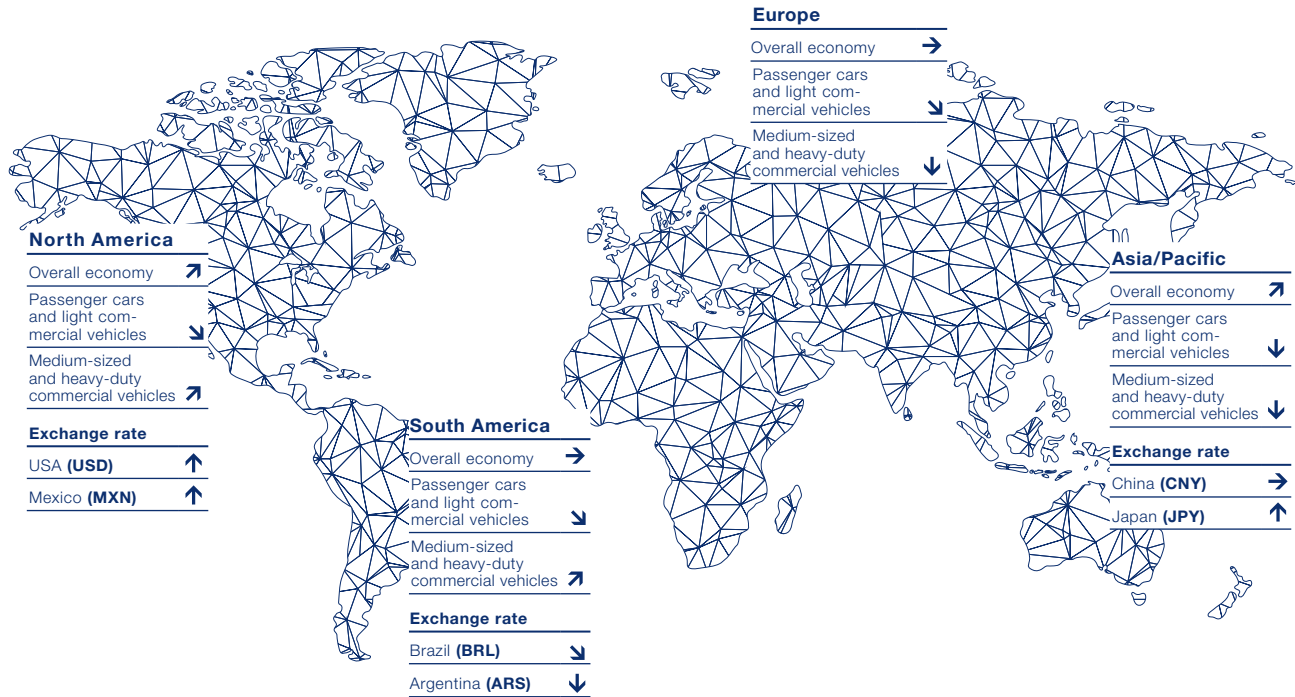
### Exchange rate development

As an internationally operating group, MAHLE also transacts business in foreign currencies. Exchange rate movement is of central importance in this respect, because it affects the conversion of financial data for accounting purposes.

The trading currencies of particular significance for our company developed in a variety of ways in the 2019 business year. Measured by the average market price (direct quotation), the US dollar rose in value against the euro (+6 percent) with similar trends for the Japanese yen (+7 percent), the Mexican peso (+5 percent), and the Chinese renminbi (+1 percent). Other currencies depreciated, in some cases losing significant value—including the Argentine peso (–36 percent), the Turkish lira (–11 percent), and the Brazilian real (–2 percent).

For MAHLE, exchange rate fluctuations are closely linked to financial and economic risks. Where possible, we minimize these risks using a process known as natural hedging: by operating production locations in all major sales regions around the world, the group is less affected by currency turbulence and exchange rate fluctuations.





Exchange rate development of various foreign currencies against the euro (EUR) as measured by the average market price compared with the previous year: Argentine peso (ARS), Brazilian real (BRL), Chinese renminbi (CNY), Japanese yen (JPY), Mexican peso (MXN), US dollar (USD)

### Development of the markets for passenger cars and light commercial vehicles

In the year under review, the production of passenger cars and light commercial vehicles fell significantly worldwide by around 6 percent. The trend from 2018 has thus not only continued, but even intensified.

After a slight decline in the previous year, the production volume in Europe decreased substantially. The uncertainty caused by Brexit, falling export volumes, and the overall decline in industrial production had a negative impact on the motor vehicle sector. In North America, restructuring measures at major US vehicle manufacturers were accompanied by a declining market. The sector was also adversely affected by the trade dispute with China. The South American market for passenger cars and light commercial vehicles contracted sharply in the year under review, primarily due to sustained market weakness in Argentina. In China, the negative trend of the previous year intensified significantly. The trade war with the United States, increased living costs, and tougher vehicle financing conditions were reflected in falling private demand. Vehicle production in India likewise experienced a significant decline. In addition to a variety of difficulties, increased financing costs in particular depressed demand.

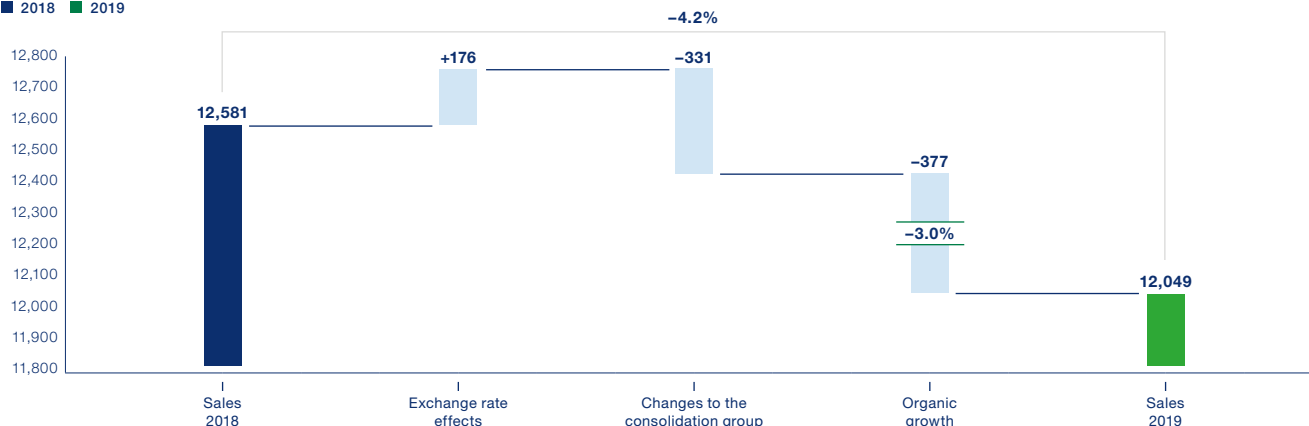
### Development of the markets for medium-sized and heavy-duty commercial vehicles

The market for medium-sized and heavy-duty commercial vehicles also experienced a downward trend in the year under review, falling by around 4 percent below the previous year's value in terms of production figures. This is attributable to significant declines in India as well as in Europe. India suffered particularly badly from the shadow banking crisis, which made financing conditions much more difficult. This led to a massive slump in the sales of commercial vehicles. In Europe, the markets showed a marked decline, especially in the second half-year. Alongside anticipatory effects in the first half-year due to the introduction of smart tachographs—digital trip recorders for newly registered vehicles—this is mainly due to the economic slowdown. In North America, the sector continued to benefit from the full order books of 2018; however, new orders have already fallen sharply. In South America, the market for medium- and heavy-duty commercial vehicles once more showed solid growth in the year under review. Production in China, the largest commercial vehicle market, initially declined sharply, but stabilized slightly above the previous year's level in the second half of the year.

## SALES BRIDGE

in EUR million

■ 2018 ■ 2019



## Business development

### Development of the MAHLE Group

In the year under review, our group generated sales of EUR 12.0 billion. Our sales therefore fell organically (i.e., after adjustment for exchange rate effects and changes to the consolidation group) by 3.0 percent. Compared with the world market for passenger cars and commercial vehicles, this decrease was less pronounced.

The principal reasons for the total drop in sales of 4.2 percent were, on the one hand, the marked economic slowdown in the automobile and commercial vehicle sector and, on the other, changes to the consolidation group to the amount of minus EUR 331 million. This was primarily caused by the sale in June 2018 of our shares in the joint venture Hella Behr Plastic Omnium (HBPO), which had previously been consolidated on a proportionate basis. Certain smaller transactions in 2019 resulted in opposing sales effects. These include the acquisition of MAHLE Ebikemotion S.L.U. in October 2018 and of MAHLE ZG Transmissions GmbH in January 2019 as well as the increased shareholding in MAHLE Aftermarket Italy S.p.A. in May 2018 and in the previous joint venture MAHLE Behr Grugliasco S.p.A. in August 2018. Exchange rate effects of EUR 176 million also had a positive impact on the development of sales.

Against the backdrop of the difficult market situation faced by the automotive industry, the transformation throughout the sector is making progress. We continue to focus on our dual strategy. Consequently, 2019 was also marked by a stronger orientation toward promising technologies and fields of application. This strategy requires a high level of investment and of development effort. These steps are in turn associated with cost increases, which we must counter around the world through savings in areas of weak added value. We initiated Performance Lift at the start of 2019 for this purpose—an internal program to

increase profitability that brings together and selectively expands existing cost-cutting initiatives. However, Performance Lift is much more than just a cost reduction program. It allows us to work together to introduce improvements quickly and effectively. The so-called Plant Performance Initiative sprints at our plants are an excellent example of this approach. In concentrated four-week periods, interdisciplinary teams cooperate to develop measures to increase the performance of our plants around the world. We are now gradually rolling out the resulting improvement ideas throughout our organization and have already made good progress during the year under review—although we must continue to work on the full implementation in order to identify and realize all areas of potential. In this context, we decided on a series of restructuring measures at various European locations in the business year and have already begun implementing some of them.

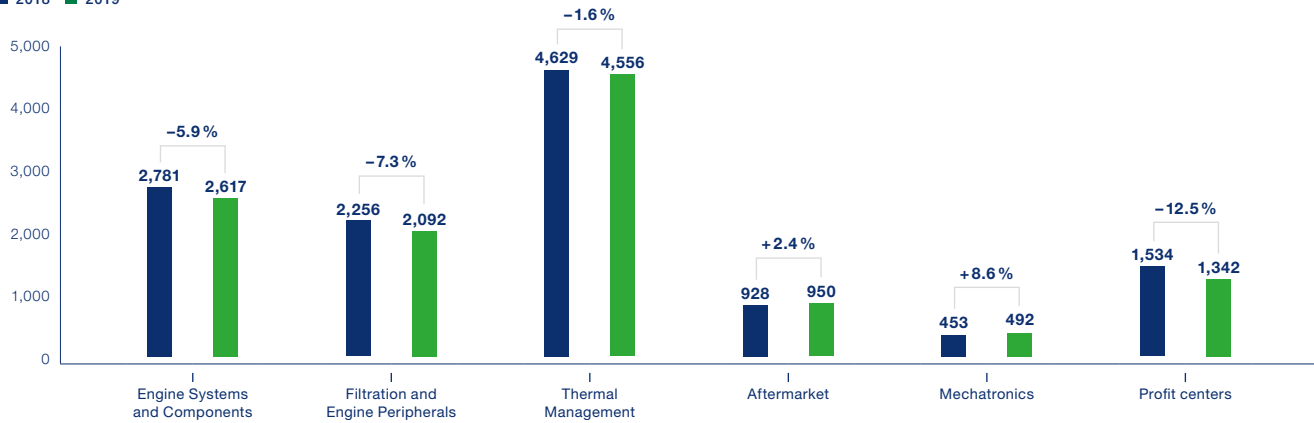
At the end of 2018, we formulated and explicitly set out our Vision for the first time: “MAHLE—We shape future mobility.” In one example of how we are making this commitment a reality, we acquired the transmission specialist MAHLE ZG Transmissions GmbH in January 2019, thereby expanding our expertise to include the transmission—a key component. With the purchase of a license package from WiTricity for the wireless charging of electric vehicles, we have continued to build our portfolio with the addition of an element that is vital to the long-term expansion of e-mobility.

Furthermore, we are strengthening our established business units: On the one hand, this relates to our core business in thermal management, with the increase in our shareholding in the MAHLE Behr Group. On the other, we are creating an even better position for ourselves in the aftermarket business segment in terms of thermal management products with the acquisition of all the shares in the former joint venture Behr Hella Service (BHS) in early 2020.

## SALES BY BUSINESS SEGMENT

in EUR million

■ 2018 ■ 2019



### Development of the business segments

The difficult market conditions also had an impact on many of our business segments in the form of declining sales. However, key future business areas bucked this trend and developed positively. Our Aftermarket business unit, the Mechatronics division, and our profit centers thus achieved organic growth in the year under review.

#### Engine Systems and Components business unit

Sales in our Engine Systems and Components business unit amounted to EUR 2,617 million in 2019 and were therefore 5.9 percent below the previous year's value. Revenue from passenger car gasoline and diesel engine pistons, piston rings, commercial vehicle steel pistons, and bearings declined. In contrast, sales of steel pistons for passenger cars and of assembled camshafts increased, primarily as a result of project ramp-ups in Europe. Despite the successes in these two product groups, a marked drop in sales was recorded in Europe. Sales also declined in North America and Asia/Pacific. Sales in China fell appreciably, especially as a result of the general market downturn due to the trade dispute between

the USA and China. In India, regulatory interventions by the government caused a fall in sales of camshafts and passenger car diesel pistons in particular. Sales of valves rose in South America; however, revenue fell under the previous year's level owing to significant negative effects arising from currency conversion.

#### Filtration and Engine Peripherals business unit

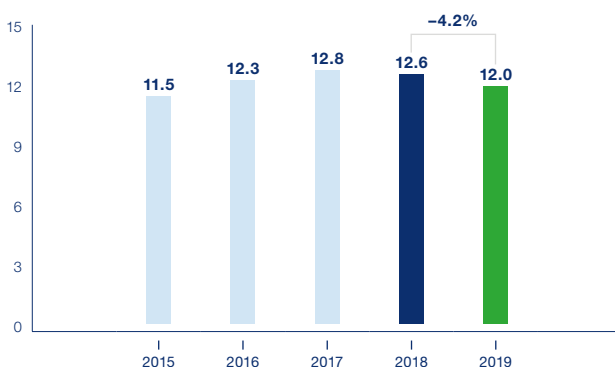
At EUR 2,092 million, sales generated in the Filtration and Engine Peripherals business unit were 7.3 percent below the 2018 level. Adjusted for the reorganization of the pumps business into a separate profit center, the decline was 2.7 percent. At product level, tank ventilation modules achieved the strongest sales growth, while the greatest losses were recorded in air intake modules and air filters. The regions predominantly experienced a downward trend. However, significant organic sales growth was generated in Asia/Pacific. In this region, we mainly have business relationships with customers that were not as strongly affected by the downturn in China and India. As far as development is concerned, we are continuing to increase our focus on customer solutions that are unrelated to the combustion engine, such as applications involving high-strength plastics and battery systems.

#### Thermal Management business unit

Sales in the Thermal Management business unit declined from EUR 4,629 million to EUR 4,556 million. Adjusted for consolidation effects and for positive exchange rate effects, the organic sales deficit amounted to 3.6 percent. Higher sales in the battery cooling product group could not offset the effects of the general market trend. From a regional perspective, North and South America in particular developed positively. In North America, we achieved sales increases in comparison with the previous year owing to high order volumes in air conditioning and cooling for passenger cars as well as trucks. Sales in South America exceeded those of the previous year appreciably, with mid-single digit organic growth in percentage terms. This was due to the recovery in the market, in particular for commercial vehicles. In Europe, revenues were markedly lower than in the previous year—especially as a result of

### DEVELOPMENT OF SALES 2015 – 2019

in EUR billion



the high level of uncertainty caused by Brexit and the general market weakness in the passenger car and truck sectors. In the Asia/Pacific region, the difficult market environment in China and India led to sharp drops in sales.

### Aftermarket business unit

In the Aftermarket business unit, we recorded sales totaling EUR 950 million, over 2 percent more than in the previous year. Negative effects from currency translation were virtually balanced out by the positive effect on sales associated with the first consolidation of MAHLE Aftermarket Italy S.p.A. In terms of our global markets, Europe and South America showed the strongest growth after adjustment for exchange rate effects. The successful expansion of our business with Service Solutions products in Europe is one reason for this, and it is also due to exports to North America and the positive development of the filter products business in Europe.

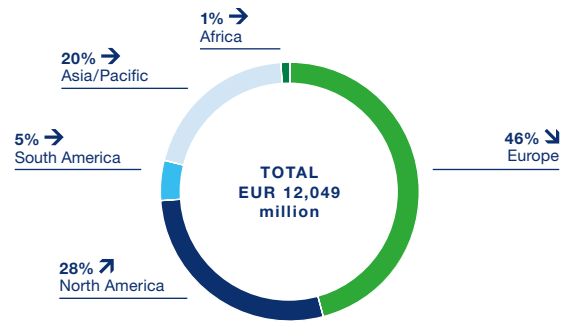
### Mechatronics division

Sales in our Mechatronics division grew strongly by 8.6 percent to EUR 492 million in the year under review. A significant boost in sales resulted from the acquisition of MAHLE Ebikemotion S.L.U. in 2018; adjusted for this effect, growth of 5.2 percent was achieved. The two most important regions in terms of sales, Europe and Asia/Pacific, recorded significant revenue growth. We want to continue strengthening these regions, which is why we invested in increasing capacity in China and in expanding the production of electric drive motors in Slovenia in the year under review. We likewise developed our location in Motilla del Palancar/Spain into a production center for power electronics. Certain production ramp-ups are worthy of note too, such as that of pedelec drives in China as well as new generations of input filters and EPS motors. We also successfully entered the starter motor business in the heavy-duty segment in the year under review.

### Profit centers

In our profit centers, we achieved sales amounting to EUR 1,342 million. Several effects must be taken into account when making a comparison with the previous year: the separation of the pumps product group from the Filtration and Engine Peripherals business unit, the acquisition of the transmission specialist MAHLE ZG Transmissions GmbH in January 2019, and the sale of our shares in the joint venture HBPO in 2018, which had been run as the Front-end Modules profit center. After adjustment for these effects, sales growth is 4.1 percent. Compressors—our strongest profit center in terms of sales—contributed to this result with growth of 4.3 percent. Despite a challenging market environment, revenue in this area developed especially positively in China; this is attributable to our main customer, which was able to improve its market share. Sales in South America also grew significantly. Our Large and Small Engine Components, Industrial Thermal Management, and Control Units profit centers also increased their sales.

## SALES BY REGION



The directional arrows (↗ → ↘) show the change in the proportion of sales compared with the previous year

### Development of the regions

With production and development locations in 32 countries, the MAHLE Group has a presence around the globe. Thanks to our broad international positioning, we are close to our customers and able to cooperate with them directly while also responding flexibly to regional market fluctuations.

Challenging automotive markets around the world have contributed to declines in sales in most regions. The only exceptions were South America and Africa, where we achieved organic growth after adjustment for exchange rate effects that were in part substantially negative. At the same time, our revenues in North America and Asia/Pacific benefited from positive currency effects in 2019, which stabilized sales in these regions. In the following, we provide an overview of the detailed development in the regions, based on sales by country of production.

#### Europe

Sales in the Europe region amounted to EUR 5,569 million—a fall of 9.6 percent in comparison with the previous year. In terms of organic growth, however, the drop in sales was significantly lower at around 4 percent. In addition to changes to the consolidation group, a variety of factors had a negative effect on revenue: the impacts of the cooling situation in terms of the market and economic climate in the automotive and commercial vehicle industry, falling non-European exports, the diesel issue, and the weak order situation at British locations as a result of Brexit. With regard to our business segments, our Aftermarket business unit, our Mechatronics division, and our profit centers showed the most growth.

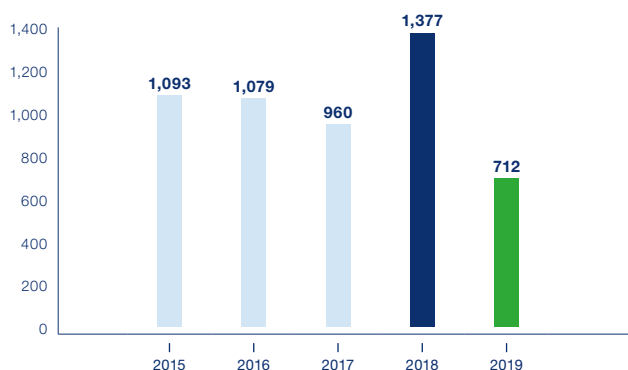
#### North America

In North America, we generated revenue of EUR 3,391 million, which is almost 3 percent above the previous year's value. Our sales increased, both in the market for passenger cars and light commercial vehicles and in the market for medium-sized and heavy-duty commercial vehicles. We were not able to continue the very strong organic sales increase from the previous year in 2019. Adjusted for markedly positive translation effects from



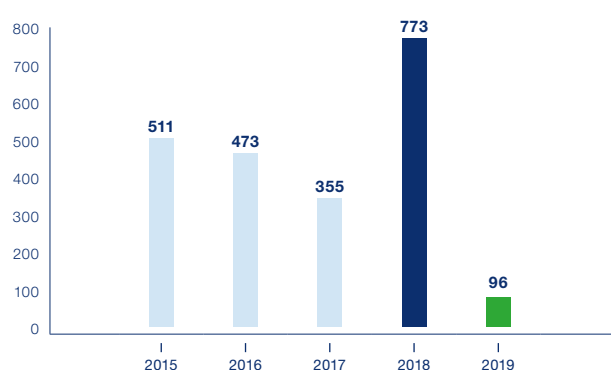
## DEVELOPMENT OF EBITDA 2015–2019

in EUR million



## DEVELOPMENT OF EBIT 2015–2019

in EUR million



exchange rate movements primarily in the US dollar, the overall result showed an appreciable decline. Strike-related difficulties on the customer side were the main reason for this.

### South America

Sales in South America rose by 0.9 percent to EUR 630 million. However, account must be taken of negative exchange rate effects of EUR 55 million arising from the devaluation of the Argentine and Brazilian currencies against the euro. Excluding these effects, a strong rise in organic sales of 10 percent was achieved. Our growth in the region was thus noticeably above the general market trend. We were able to increase our revenues in local currency significantly in almost all business areas, particularly in the medium-sized and heavy-duty commercial vehicles segment.

### Asia/Pacific

In the Asia/Pacific region, sales in the year under review were 1.3 percent below the previous year's value at EUR 2,404 million. Decisive factors here included the cyclical market downturn in China and the particularly low number of registrations in India in the year under review—a consequence of declining consumer demand. These impacts were reflected in significant drops in sales in the Engine Systems and Components and Thermal Management business units. By contrast, our Mechatronics division and our Compressors profit center in particular were able to withstand these influences. The Filtration and Engine Peripherals and Aftermarket business units also recorded sales increases.

### Africa

With a rise of 4.4 percent, sales from our locations in Africa rose to EUR 55 million despite negative exchange rate effects. The revenues in our group's smallest region were primarily generated by the Thermal Management business unit.

## Net assets, financial position, and results of operations

### Results of operations

In the 2019 business year, MAHLE generated sales of EUR 12.0 billion; adjusted for changes to the consolidation group and exchange rate effects, this corresponds to a decrease of 3.0 percent. Due to the declining automotive market, our expectation from the start of the year—at which time we anticipated a slight organic sales increase in a stable market situation—was thus not fulfilled. As anticipated, at EUR 10 million, the result from business activities was significantly lower than in the previous year (EUR 614 million), in part owing to non-recurring income from previous years and extraordinary burdens in the current year. Specifically, the following one-time effects were involved: while disposal gains from the sale of the shares in the joint venture HBPO exerted a strong positive impact on the previous year's value, high levels of expenditure were incurred in the year under review in relation to several planned restructuring measures, for which accounting provisions had to be made. Adjusted for these two special effects, the decrease in the result from business activities was significantly lower and amounted to a figure in the high-double-digit millions, for which sales losses resulting from the economic slowdown in the automobile and commercial vehicle sector were largely responsible. These effects had an equally severe negative influence on our operating income figures EBITDA and EBIT and, to some extent, on the operating result used for internal steering—a key figure similar to EBIT but adjusted for individual circumstances.

The key income statement items developed as per the following details: Cost of sales amounted to EUR 10,136 million, which is EUR 208 million below the previous year's value. The cost of sales ratio increased markedly, from 82.2 percent to 84.1 percent. In addition to operational inefficiencies at individual locations, a particular reason for this rise is the development of restructuring accruals in connection with capacity adjustments. We have reduced our selling expenses by a good 6 percent to

## CONSOLIDATED INCOME STATEMENT

in EUR million	2019	in %	2018	in %
Sales	12,049	100.0	12,581	100.0
Cost of sales	-10,136	-84.1	-10,344	-82.2
<b>Gross profit on sales</b>	<b>1,913</b>	<b>15.9</b>	<b>2,237</b>	<b>17.8</b>
Selling expenses and general administrative expenses	-1,080	-9.0	-1,109	-8.8
Research and development expenses	-751	-6.2	-751	-6.0
Other operating income and expenses	31	0.3	409	3.3
Financial result	-104	-0.9	-172	-1.4
<b>Result from business activities</b>	<b>10</b>	<b>0.1</b>	<b>614</b>	<b>4.9</b>
Taxes on income	-189	-1.6	-136	-1.1
<b>Result after taxes</b>	<b>-180</b>	<b>-1.5</b>	<b>478</b>	<b>3.8</b>
Other taxes	-32	-0.3	-32	-0.3
<b>Consolidated net loss/net income</b>	<b>-212</b>	<b>-1.8</b>	<b>446</b>	<b>3.5</b>
<b>EBIT</b>	<b>96</b>	<b>0.8</b>	<b>773</b>	<b>6.1</b>
<b>EBITDA</b>	<b>712</b>	<b>5.9</b>	<b>1,377</b>	<b>10.9</b>

EUR 560 million. The ratio in relation to sales also fell to 4.6 percent (previous year: 4.7 percent), which was achieved by general cost reduction measures in Sales and lower costs of expedited freight. By contrast, general administrative expenses rose from EUR 512 million to EUR 520 million, which is due in particular to provisions for restructuring measures aimed at reducing administrative structures. Expenditure on research and development was close to the previous year's level; however, the ratio in relation to sales rose by 0.2 percentage points owing to lower sales. This high level of R&D expenditure shows that our work to implement our dual strategy is resolute and goal-oriented. The balance of other operating income and expenses decreased significantly by EUR 378 million in comparison with the same period of the previous year. The main reason for this was the absence of one-time income from the sale of holdings in 2018. Owing to the acquisitions made in previous years—with the exception of research and development expenses and administration costs—all cost items were adversely impacted by the effects of purchase price allocations in accordance with the German Commercial Code (HGB). In total, these amount to EUR 113 million and include EUR 48 million relating to planned amortization of goodwill.

The development of the items in the income statement resulted in a substantial decrease in EBIT from EUR 773 million in 2018 to EUR 96 million in the year under review. The EBIT margin thus fell significantly to 0.8 percent (previous year: 6.1 percent), mainly due to the one-time effects outlined above. Adjusted for the effects of the purchase price allocations and the amortization of goodwill, the EBIT margin was at 1.7 percent (previous year: 7.2 percent).

The financial result significantly improved by EUR 68 million in 2019 in comparison with the previous year. This was largely the result of a positive market development in pension assets and

the absence of negative effects in connection with the sale of shares in the joint venture Bosch MAHLE Turbo Systems (BMTS), which took place in 2018.

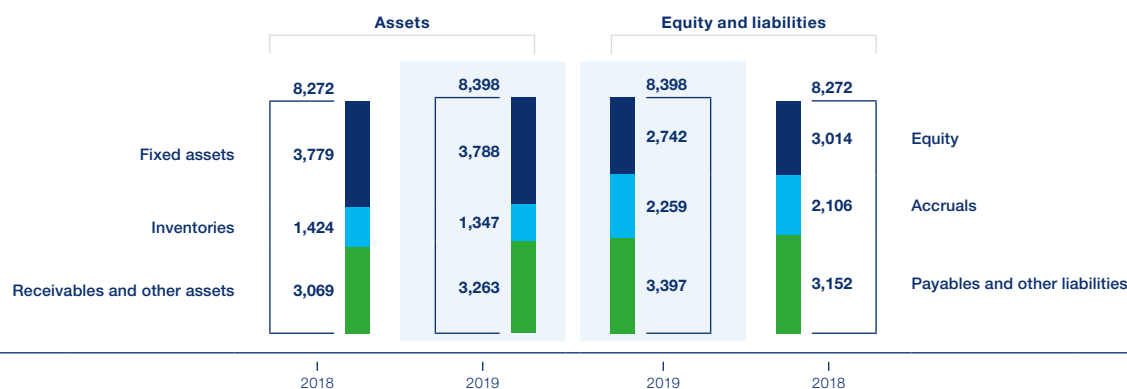
Despite the considerably lower result from business activities, taxes on income increased by EUR 54 million to EUR 189 million. This clearly disproportionately high tax burden in relation to the profit before tax can be attributed to a number of factors. First, the accrual of local profits was relatively greater in high-tax countries. Second, although high amortization of goodwill reduced the commercial result, it did not lower the tax base to the same extent. And third, expenditure increased due to a marked rise in loss allowances on deferred tax in respect of temporary differences and to the nonrecognition of deferred tax assets with regard to tax loss carryforwards. The lower income tax rate in 2018 was largely influenced by the fact that the income from the sale of the HBPO shares had not increased the tax base to the same degree as it had the commercial result. Consequently, the overall result was a net loss for the year of EUR 212 million (previous year: net income for the year of EUR 446 million).

### Net assets position

As at the balance sheet date of December 31, 2019, our balance sheet total had increased by EUR 126 million to EUR 8,398 million. At EUR 3,788 million, fixed assets were only slightly above the previous year's level. Tangible fixed assets increased by EUR 66 million in comparison with the previous year, in particular owing to investments in technical equipment and machinery, whereas intangible fixed assets decreased by EUR 62 million. Additions to intangible assets, which were mainly connected with the acquisition of further shares in MAHLE Behr as at January 1, 2019, were more than offset by amortization. This essentially related to the amortization of goodwill and hidden reserves, which was disclosed as part of purchase price allocations.

## BALANCE SHEET STRUCTURE OF THE MAHLE GROUP

in EUR million



Current assets of the MAHLE Group exceeded the previous year's level by EUR 133 million, amounting to EUR 4,300 million in the year under review. In contrast, our inventories fell sharply by EUR 78 million to EUR 1,347 million. This is a reflection of our efforts to reduce our capital commitment and is largely attributable to the decrease in inventory levels of raw materials, consumables, and supplies. While trade receivables adjusted for exchange rate effects were more or less at the same level as in the previous year, other assets rose by EUR 28 million as at the balance sheet date. Owing to new German private placement loans (Schuldscheindarlehen) taken up in the year under review, our liquid funds increased by EUR 160 million as well.

liabilities to banks rose by EUR 362 million, largely due to the issue of German private placement loans. This led to an increase in net debt on our balance sheet to EUR 1,340 million in the year under review.

Besides the circumstances depicted in the balance sheet, we recorded the following significant off-balance-sheet transactions as at December 31, 2019: on the one hand, rental and leasing agreements particularly for land and buildings to a total sum of EUR 166 million (previous year: EUR 125 million) and, on the other, factoring amounting to EUR 30 million (previous year: EUR 108 million), which we utilized to diversify financing sources.

### SIGNIFICANT INCREASE OF

# 21%

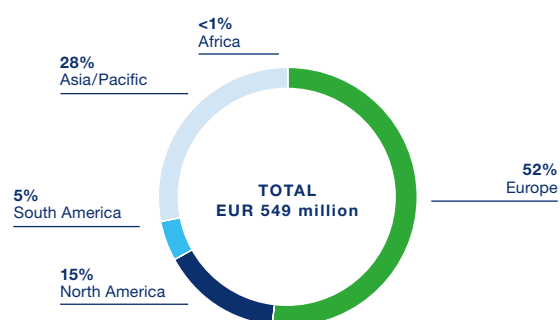
in operating cash flow in 2019

Due to the net loss for the year and the dividend distribution, the MAHLE Group's equity reduced significantly by EUR 272 million to EUR 2,742 million in the year under review. This led to a corresponding reduction in our equity ratio, from 36.4 percent to 32.7 percent. Accruals rose to EUR 2,259 million, which corresponds to an increase of EUR 153 million in comparison with the end of 2018. Major factors in this were, on the one hand, the setup of extensive restructuring accruals and accruals for other personnel-related obligations. On the other, accruals for pensions increased by EUR 45 million, primarily owing to interest effects. Liabilities grew in comparison with the previous year by a total of EUR 248 million, with trade payables and other liabilities falling by EUR 83 million and EUR 40 million respectively. In contrast,

### Investments

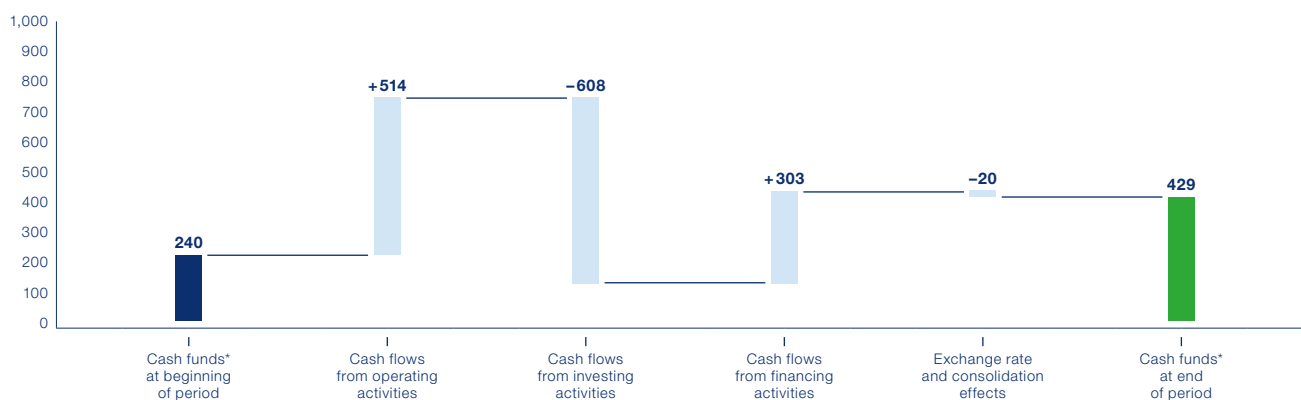
At EUR 549 million, our investments in tangible fixed assets were EUR 60 million lower than in 2018. The investment ratio, which shows the relationship between investments and sales, decreased to 4.6 percent (previous year: 4.8 percent). With a ratio of 113 percent, investments exceeded the depreciation on tangible fixed assets, although to a lesser degree than in 2018 (136 percent).

### INVESTMENTS BY REGION



## CASH FLOWS

in EUR million



\* Cash in hand, bank balances with an initial term less than 3 months, and checks less liabilities to banks with an initial term of less than 3 months

Our investments in the year under review focused on Europe and the Asia/Pacific region. More than half of these investments were made in Europe, where Germany was the country with the highest level of capital expenditure. With regard to other European countries, production facilities and plants in Poland, Spain, Romania, and Slovenia were among the locations where expansions took place. The Asia/Pacific region accounted for around 28 percent of our investments. As in the previous year, the majority of our investment here was directed toward our Chinese locations. In doing so, new production capacity was added, and existing capacity expanded, as in the case of the extensive investments in the expansion and construction of production lines at the mechatronics plant in Taicang. By contrast, we scaled back investments in North America somewhat in 2019. As a result, only around 15 percent of our capital expenditure was made in this region in the year under review. Our investments in South America, on the other hand, remained at the previous year's level.

In addition to capital expenditure on tangible fixed assets, we also took advantage of strategic acquisitions during the year under review to expand our business activities as part of our dual strategy. We thus increased our participation in MAHLE Behr to strengthen our core business in thermal management. Furthermore, we acquired the transmission specialist MAHLE ZG Transmissions GmbH in January 2019 in order to expand our expertise to include the transmission—a key component.

### Financial position

As part of its global growth, MAHLE has established a broad basis for its group financing over the past few years and improved its diversification. Our financing portfolio not only includes syndicated credit lines, German private placement loans, and bilateral loans, but also euro-denominated corporate bonds.

With our conservative financing policy, we are pursuing the objective of an implicit investment grade risk. This positioning is also reflected in the moderate leverage and solid equity ratio.

In the 2019 business year, we increased the existing syndicated credit line with our core banks to EUR 1.8 billion, fixing a term until 2024. In July, to gain greater room for maneuver, we also issued euro- and US dollar-denominated German private placement loans amounting to EUR 175 million and USD 213 million. In addition, a new private placement bond totaling EUR 30 million was issued in connection with the maturity of a bond. As at the end of the year, the unused but firmly committed credit lines amounted to EUR 1,887 million, which, as in the case of the liquid funds, contributed to the financial stability of the group. Our cash holding was diversified across various banks that were selected according to rating criteria.

The proceeds from the issuance of a private placement bond and the take-up of German private placement loans also meant that we closed the 2019 business year with positive cash flows of EUR 209 million. Despite the net loss for the year of EUR 212 million, cash flows from operating activities amounted to EUR 514 million and were thus appreciably higher than the previous year's value. This is a reflection of our efforts with regard to working capital management and—in comparison with 2018—the substantially lower cash outflows in connection with warranty claims, among other factors. Conversely, at EUR 608 million, the net cash outflow arising from our investing activities substantially exceeded the previous year's value. This was because disposals in 2018 had led to an extraordinarily high level of cash income—an effect that was not offset by the low expenditure on tangible fixed assets and on strategic acquisitions in the year under review. Cash flows from financing activities showed total net cash inflows of EUR 303 million as a result of the abovementioned issuances.



We want to secure our long-term success. Our research and development activities continue to be central to this goal.

Following its successful pilot phase, we are gradually introducing the MAHLE Production System at other plants.

The quality of our products was recognized by numerous customers in 2019. In total, we received around 85 awards.

# Additional key performance indicators

## Human resources

As at the end of 2019, the MAHLE Group employed 77,015 people worldwide, 3.2 percent fewer than in the previous year. The fall of 2,549 employees is mainly due to the declining order situation.

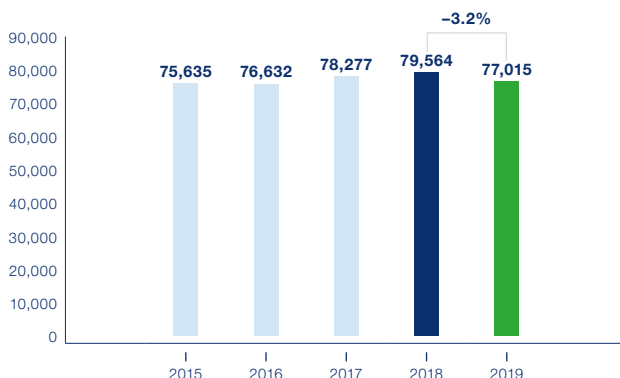
Our employees are the key to the future viability of the MAHLE Group. Their know-how, motivation, and commitment are the foundation of our successful development. This is why we invested in the training and further education of our workforce to the sum of EUR 9.3 million in the year under review – despite the difficult economic situation in the sector. In addition to a variety of workplace-related briefings, our employees took part in 99,724 qualification activities in the year under review (previous

year: 93,835). The global absence rate (excluding joint ventures) amounted to 3.9 percent in the year under review (previous year: 3.8 percent).

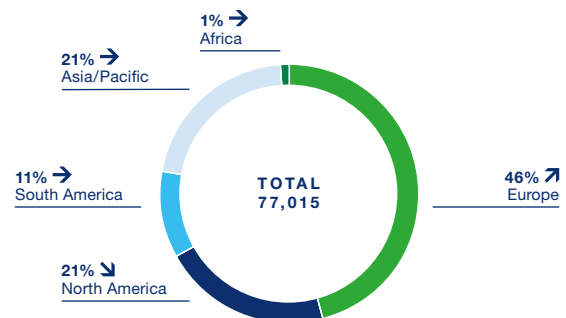
### Headcount by region

As at the reference date, we employed 35,336 people in Europe, corresponding to a reduction in the workforce of 319 employees (–0.9 percent) in comparison with the previous year. We had to lay off staff at our locations in Czechia, Great Britain, France, Germany, and Austria due to falling demand. Thanks to new product lines, we expanded our team in Romania by 210 employees. An increase in production capacity also led to the appointment of 230 people at the Mechatronics division's locations in Spain.

HEADCOUNT DEVELOPMENT 2015–2019



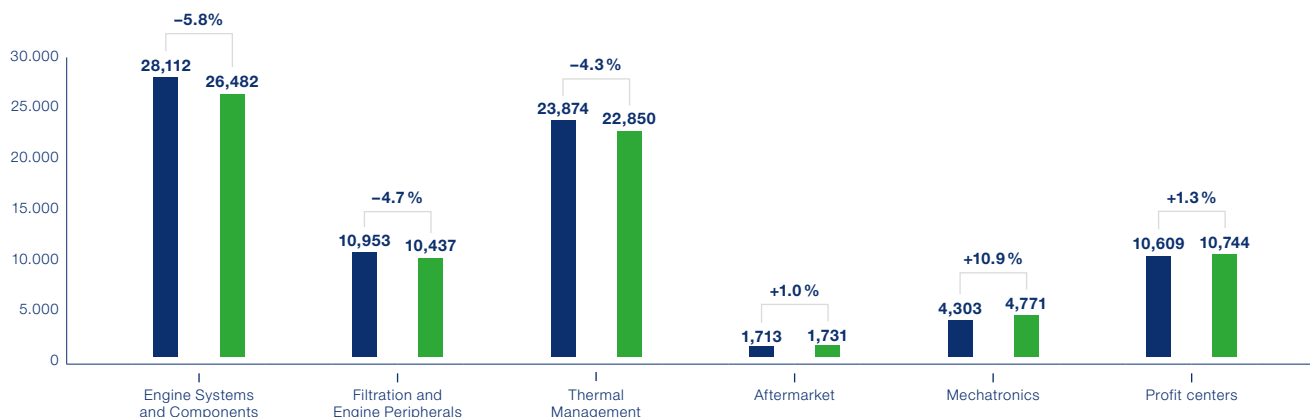
HEADCOUNT BY REGION



The directional arrows (↗ ↘ ↙ ↚) show the change in the proportion of employees compared with the previous year

## HEADCOUNT BY BUSINESS SEGMENT

■ 2018 ■ 2019



In North America, our employees numbered a total of 16,136 as at the end of 2019 and thus 954 (-5.6 percent) fewer than in the previous year. To offset decreasing orders through improvements in efficiency, we reduced our headcount in Mexico by 753 employees.

Compared with the previous year, our staffing level in South America fell by 7.5 percent to 8,391. The reduction of a total of 683 employees is likewise attributable to declining order volumes and the impact of improvement initiatives.

In the Asia/Pacific region, our employees numbered 16,161 as at the end of the year under review, 536 fewer people (-3.2 percent) than in the previous year. In Asia too, the reduction in staffing levels was associated with declining sales and optimization measures—primarily in China.

In Africa, we employed 991 staff as at the reference date, 57 people fewer in total than in the previous year (-5.5 percent).

### Headcount by business segment

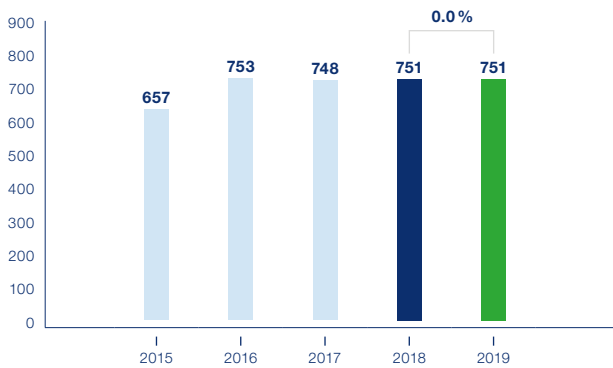
In our Engine Systems and Components business unit, the staffing level decreased by 1,630 employees. At 34.4 percent, the majority of our group's employees still worked at one of the 43 locations belonging to this business unit. We employed around 30 percent of our total workforce at the 37 locations of the Thermal Management business unit. In comparison with the previous year, we numbered 1,024 fewer employees in this area. Around 13.6 percent of the group's workforce worked in the Filtration and Engine Peripherals business unit's 36 plants, 516 employees or 4.7 percent fewer than in 2018. Adjusted for the reorganization of the pumps business into a separate profit center, the decline was 2.6 percent. The staffing level in Aftermarket, our smallest business unit in terms of personnel, grew by 18 employees—a slight rise in comparison with the previous year. With an increase of 468 employees (+10.9 percent), the Mechatronics division expanded considerably through the implementation of our dual strategy and reached a 6.2 percent share of our total workforce. In the profit centers, we recorded a slight rise in personnel amounting to 135 employees compared with the previous year, due to the integration of the Pumps profit center.

## Technology and innovation

We maintained our group-wide research and development activities at a high level in the year under review, despite the difficult market conditions, investing EUR 751 million as in the previous year. In relation to sales, that is a ratio of 6.2 percent, following on from 6.0 percent in the previous year. This high level serves to highlight the great importance attached to research

## R&D EXPENDITURE 2015–2019

in EUR million



and development (R&D) in our group. In terms of personnel, we continued to expand the R&D function and hired new development engineers and technicians. As at December 31, 2019, this area of our business employed 6,167 staff. In the year under review, we registered around 345 new patents in addition to a good 600 records of inventions. In order to further accelerate our R&D projects in the future, we encourage flexible cooperation in our globally active teams and take advantage of short reporting lines, flat hierarchies, digitalization, and Industry 4.0. One good example is our MAHLE Incubator, which we use to empower our employees to develop new business models themselves. This means that ideas arising in R&D have the potential to quickly become corporate start-ups. The best examples of this are chargeBIG and Retromotion.

### TOTAL RECORDS OF INVENTIONS IN 2019:

# 600

with 6,167 R&D employees

In 2019, we continued to pursue our dual strategy. On the one hand, we consistently drove forward the development of systems and components for alternative drive concepts, including hybrid and battery-powered electric drives as well as fuel cells

and products designed for use with synthetic fuels. The goal is demand-oriented mobility, which, irrespective of the technology, uses drive types that match the specific application. On the other hand, we worked to further optimize the combustion engine—with the goal of making it even cleaner and more efficient. Not only did conventional engine testing come into play here, but new concepts from the fields of additive manufacturing and the rapid prototyping of pistons and charge air coolers, for example, were also involved.

With a battery management system including integrated thermal management, we developed a solution in the year under review that further increases the rapid charging capability of **electric vehicle** batteries. As a result, traction batteries can be designed to be significantly smaller, because they can be charged more quickly. In this way, we are not only improving the carbon footprint of the electric vehicle, but also lowering the demand for raw materials for battery production, which are becoming increasingly scarce worldwide.

The fact that batteries and power electronics need to be cooled simultaneously gives rise to complex circuits that substantially increase the demands on the individual components and on thermal management control systems. The diversification of the powertrain has increased the complexity of design and production as well. In 2019, we developed a modular cooling system to allow vehicle manufacturers to use different powertrains on one platform, thereby minimizing the design effort required when it comes to **thermal management**.

In terms of **synthetic fuels**, we studied the influence of alternative fuels on filter media and engine components in the business year. At the same time, we ran engine tests through which we determined the proportions up to which engine operation is possible without adjustments to hardware or software if fuels outside the current standard are admixed. Our investigations have shown that we would be able to leverage areas of environmental and financial potential in the event of changes to the corresponding conditions.

As regards **fuel cells**, we worked within the scope of an interdisciplinary project in 2019 to transfer research and development findings relating to conventional transport to fuel cell technology and to make thermal, air, and liquid management and filtration work together as a system. The long-term objective of this work is to achieve cost parity with the conventional combustion engine, especially for heavy vehicles used over long distances.

In view of the market development of **hybrid vehicles**, we have designed a new, fully integrated, and modular hybrid drive that can be tailored to suit a wide range of vehicle applications. The MAHLE Modular Hybrid Powertrain is a fully integrated, plug-in hybrid drive incorporating a two- or three-cylinder turbocharged gasoline engine, a substantially simplified transmission, and two electric motors.

## Purchasing

In the business year, we made preparations to secure supplies to our plants in the event of Brexit, or indeed of a “no-deal” Brexit. For example, we made sensible adjustments to our stock levels—where necessary—and increased availability times in some cases. In addition, we raised awareness of the subject of Brexit among the companies in our supply chain, called for appropriate preparatory action, and initiated further precautions.

Purchasing was also influenced by international trade disputes. The impact of punitive tariffs and other trade restrictions on material costs could only be partially offset. However, the situation with regard to raw material prices eased in comparison with previous years—although only for those raw materials unaffected by trade restrictions.

Macroeconomic effects and the associated drop in volumes put our supply chain under pressure. In addition, the economic situation led to an increasing number of business failures among our suppliers, resulting in additional expenditure for our group.

We want to make our purchasing processes more efficient overall by, for example, increasing the digitalization of process flows. We introduced the ePAID (early PAyment, Invoiced Digitally) program for this purpose in 2019. On the one hand, our suppliers can prefinance their receivables from us, and on the other, we are able to use this platform to digitize incoming invoices at MAHLE with the aim of receiving only digital invoices in the future. We also successfully implemented the pilot version of our eBuy purchasing portal in the year under review, which we are using to advance the digitalization of our purchasing activities with respect to indirect materials and services as well.

## Production, quality, and environment

### Production at MAHLE

In the year under review, we continued to push ahead with our continuous improvement process, which involves all of MAHLE's approximately 160 production locations and business areas. Here, a global team discusses the most successful processes around the world and uses this exchange to identify the most important principles, methods, and standards for the MAHLE Production System (MPS) in order to make manufacturing at MAHLE even more efficient. We have been testing MPS at eight lighthouse plants in four regions since 2017. Following the successful conclusion of the pilot phase in 2019, the system was introduced to other plants alongside additional methods beginning in the middle of the year. Part of the rollout involves the creation of an MPS training academy, which will open in Krotoszyn/Poland in the second half of 2020. The academy will train internal MPS experts with the intention of avoiding the need for external support in the future. The first employees successfully qualified as MPS experts in the 2019 business year.

The subject of Industry 4.0 remained another area of focus for Production in the year under review. To address this topic, we created a new central function that aims to intensify international cooperation, specialist knowledge-sharing, and internal communication and thus accelerate the digital transformation at group level and in particular at the level of individual production locations. Following the successful conclusion of the pilot project, MAHLE decided to implement the standardized manufacturing execution system (OneMES) in 2019. This system's benefits include the ability to evaluate machine data and improve the traceability of parts. In addition, an “i4.0 project monitor” helped us to make numerous pilot projects for Industry 4.0 transparent for MAHLE around the world. In the process, some of the projects were made more concrete and developed into technical standards for MAHLE. We launched new concepts and pilot projects, such as augmented reality (AR) communication smart glasses.

### Quality management at MAHLE

Innovative, defect-free, and reliable products and systems are the foundation of our long-term success. Quality targets are therefore core elements of our annual business plan: they are defined from the top down, fleshed out from the bottom up, and consolidated across the operational business areas. In addition, we have been using a group-wide quality management system for many years now, which is integrated into all our business processes.



In 2019, we pushed ahead with our group-wide MAHLE Quality Improvement Program in order to carry on continuously improving quality and strengthen our quality mind-set. The program encompasses the training and education of our workforce as well as projects through which we coordinate activities, standardize process flows, and optimize our products and processes. The goal is to reduce quality costs and risks and to eliminate potential sources of defects as early as the product development stage. The quality management system also supports series production.

NUMBER OF CUSTOMER COMPLAINTS  
REDUCED BY

19%

compared with the previous year

Our teams regularly discuss the outcomes of the MAHLE Quality Improvement Program and the challenges with respect to quality management; their findings feed into and optimize our process flows.

Data relating to our quality performance is presented by our customers in a variety of ways, which is why we are currently compiling a group-wide database featuring consistent reporting. The aim is to standardize the information so that we are able to make even better use of any potential for improvement it offers.

MAHLE RECEIVED AROUND

85

quality awards in 2019

Our work with regard to quality is paying off: The number of customer complaints fell by 19 percent in the year under review in comparison with the previous year, and we achieved a further reduction in the number of faulty delivered parts. In 2019, numerous customers once again recognized the quality of our products; we received a total of 85 awards.

## Safety at work and environment

To protect the health of our employees and the environment, we take a holistic approach that ranges from research and development through production and recycling. In 2019, we made further progress with the implementation of our group-wide guidelines and requirements. In this context, we also further developed our reporting system in order to better monitor the impact and success of the measures we have taken.

In terms of safety at work, in 2019, we consistently pushed ahead with the safety campaign we began in 2017. This work prioritized the harmonization of internal processes with the result that we were able to significantly cut our accident rate for the third consecutive year: from 6.8 accidents per million hours worked in 2017 to around 5.7 accidents in 2018 and 4.8 accidents in the year under review. Despite these positive trends, we will continue to drive the subject of workplace safety forward and establish it even more firmly in all our employees' minds. For example, our action plan comprises round-table discussions on safety and regular safety tours at our locations. In addition, we extended the certification of the safety at work management system according to ISO 45001 to further locations in the year under review. In the future, we plan to gradually introduce this certification at all our locations.

ACCIDENT RATE FELL BY

16%

in comparison with the previous year

When it comes to environmental protection, our focus also continues to be on energy management, with the aim of making the operation of all our locations as energy efficient as possible. By using our database, which documents lessons learned and successful processes, we are striving to tap areas of energy efficiency potential. Furthermore, we are encouraging dialog on energy-related topics at various levels.



Our corporate activities are consistently geared to opportunities and risks, which serve as our guidelines.



We are continuously developing our portfolio in the field of mechatronics and electronics. By doing so, we benefit from the expansion in the market for electric vehicles.



We use early warning systems and action plans to limit the consequences of the global decline in the production of passenger cars and commercial vehicles as effectively as possible.

# Opportunity and risk report

We use a management system to evaluate the opportunities and risks associated with our business operations. In this way, we gain knowledge from which we draw conclusions and adapt our actions accordingly. Our globally active internal audit regularly verifies the compliance and efficiency of our processes and control systems by means of an audit plan, which changes on an annual basis. Because we expect the group to continue to grow and since the transformation of the automotive industry may change the key areas of risk, we have introduced a systematic risk management process—with the following areas of focus.

## Market and technological trends

We identify long-term market and technological trends using a systematic scenario approach. As a framework, it provides a baseline scenario including the developments in our business areas, regions, products, and markets until 2030. On this basis,

EXTREME SCENARIOS FOR

# 2030

Stress test for market and technology trends

and using “extreme scenarios 2030,” we subject our company to stress tests on various aspects—such as markets, regions, drive types, quantities, and technologies. By taking market and technological trends into account in this systematic way, we ensure that we identify opportunities and risks at an early stage. The findings from these analyses are used to make decisions about future business segments and new production processes; we include the measures derived in our strategic and budget planning. In the course of preparing management reports, we monitor whether and how the agreed steps are implemented.

Opportunities and risks arise from the markets' increasing awareness of environmental considerations and from new standards to reduce emissions, for example. We therefore include all relevant topics in our international research and development activities at an early stage and focus our attention on a wide range of technologies to increase the efficiency of the combustion engine, on alternative drive configurations, and on a holistic, intelligent thermal management system. As a result, we are able to offer our customers competitive, innovative products. With our steadily growing portfolio of electric drives and auxiliary components, we are benefiting from the expanding market for electric vehicles. We have specifically strengthened these activities through multiple acquisitions, which have been pooled within our Mechatronics division and are now integrated into the group. Through acquisitions made in recent years, we have significantly expanded our thermal management business and our product portfolio to include air conditioning compressors. MAHLE therefore has the necessary resources to develop electric air conditioning compressors for the growing plug-in hybrid and electric vehicle market.

Impediments to trade such as Brexit and the tariff dispute between the USA and China, economic fluctuations, changes to the political framework in individual regions or countries, other developments that affect the global economy, and the growing number of competitors from Asia in particular can have a major impact on market developments and thus on the business development of our company. On the subject of Brexit, we have set up a working group that is continually monitoring the developments and drawing up response options. As things stand at present, this has not resulted in any significant effects on business activities. In general, our broad market base and global presence serve as important stabilizing factors and help us to counter market and customer risks. Our highly diversified customer and product portfolio is also helpful in this respect. Consequently, possible declines in demand in individual markets or from individual customers can at least be partially offset. We therefore consider a global market slump—as in the economic crisis of 2009—the impact of which could have a major negative effect on our profit, to be one of the greatest risks for our group. These adverse conditions also include largely unforeseeable events such as the SARS-CoV-2 pandemic and its consequences. In comparison with the previous year, global production of passenger cars and light commercial vehicles has already decreased markedly in the year under review with negative repercussions for the group's profit situation. We limit the resulting consequences as effectively as possible by means of appropriate early warning systems and action plans. The discussions about diesel emissions and further driving bans on older diesel models are significant uncertainty factors for the whole automotive industry. By implementing suitable measures, we aim to mitigate the potential economic effects of a shift in technology at an early stage. These effects could also be due to possible legislative changes—such as a ban on combustion engines in passenger cars applicable from a certain point in time. Through our dual strategy of playing a leading role in the ongoing development of the combustion engine from a technology perspective while also driving forward innovative solutions for alternative powertrain technology, we are readying ourselves for future scenarios of this kind. Business segments that are independent of the OEM business for the passenger car combustion engine today already account for more than 50 percent of group sales. We want to continuously increase this proportion of sales that is unrelated to the passenger car combustion engine.

#### PROPORTION OF SALES BY BUSINESS SEGMENT

> 50%

independent of the OEM business  
for the passenger car combustion engine

## Procurement and production

Our risk management system is also focused on minimizing the negative impacts stemming from the procurement markets. Regular supplier assessments prevent unexpected supply bottlenecks and/or price increases in purchasing. We have stepped up these activities in recent years and are making sure that the independence of our suppliers is maintained. In addition, we have been using a tool to monitor risks worldwide, which enables a rapid overview of the impact of natural disasters, strikes, and insolvencies. This increases transparency and thus decreases risk in the supply chain. Appropriate safety stocks and hedging transactions also serve to reduce procurement risks. Specific emerging risks that could lead to bottlenecks in the supply of purchased parts and thus to production interruptions, such as the SARS-CoV-2 coronavirus, which became known in January 2020, are managed in Supplier Risk Committees. These committees are headed by Central Purchasing management and, depending on the topic, include employees from Sales, Logistics, Production, Development, and Quality to achieve the best possible coordination to limit risks. To optimize our business processes further, our production locations all around the world cooperate with each other at all times. The existing production systems from all business areas are in the process of being consolidated into one uniform MAHLE production system. In the business year, we continued our Safety First campaign, which was launched two years ago and comprises extensive measures to guarantee safety at work. By means of improved production processes and high quality standards, we aim to ensure that operational risks—such as unforeseen circumstances, unexpected technical malfunctions, accidents, and human error—hinder production operations as rarely as possible. Thus far, the increasing number of extreme weather events, such as floods, inundations, and droughts, have impacted our production locations only in isolated cases. MAHLE counters the associated risks using an established environmental management system.

Our group has been audited and certified in accordance with recognized ISO standards and similar specifications relevant to our sector—in terms of quality, environmental protection, and safety at work, for example—and is thus subjected to important external checks that serve to limit risks. We have arranged an economically prudent degree of cover by means of insurance policies for the disruption of operations resulting from damage as well as liability risks. However, there were again quality incidents and warranty claims in the year under review, although their impact on profit was significantly less severe than in previous years. To prevent similar risks in the future, we have defined cross-functional countermeasures. In this way, our development processes will, for example, be continually scrutinized and optimized with the additional goal of limiting the risks that could arise from increasing demands from our customers to accept warranty coverage. Where legally required, financial burdens resulting from quality incidents and warranty claims originating and known as at the balance sheet date, and which are expected to result in cash outflows, are covered by accruals as part of risk provisioning.

## Finance management

Using our systematic and group-wide finance management system, we aim to ensure our optimized use of financing opportunities from the banking and capital market. The liquidity risk is covered by diversified financing facilities with staggered maturity profiles that considerably exceed our group's foreseeable financial requirements. When designing our financing mix, we take security, flexibility, and cost factors into account. Our aim is to secure the financial independence of our group, limit the financing risks, and ensure we are able to exploit business opportunities at all times. We detect currency risks by means of our group-wide planning and reporting system. In accordance with standardized group-wide principles, we counter these risks extensively using non-predictive hedging transactions over a horizon of up to 24 months. As a rule, hedging transactions relate to OTC FX forwards or swaps in the form of portfolio hedges. The use of derivative financial instruments is necessarily linked to the existence of an operational underlying transaction; expected and not yet invoiced currency risks are covered with continuously declining hedging grades. The resulting hedging relationship generates valuation units in accordance with the critical term match method. The interest rate risk is subjected to value-at-risk analyses. OTC hedging activities and other financial transactions give rise to counterparty risks with financial institutions, which we identify and evaluate across the group in our uniform reporting system. If predefined thresholds are exceeded, the counterparty risk is lessened by the targeted spread of risks.

## Human resources, IT, and accounting

Highly qualified and motivated employees are a cornerstone of our success both today and in the future. That is why it is important for us to attract suitable staff, support them on a continuous basis, help them gain further qualifications, and retain them in our company over the long term. We have developed a comprehensive personnel marketing concept and established a recruitment organization in order to initiate direct contact with potential candidates at an early stage and recruit qualified employees. We are thereby reducing the risk of not filling vacant positions or filling them only after some delay. In order to guarantee our group's long-term success and take advantage of the opportunities arising from market and technological changes, our personnel

requirement planning is geared toward developments in the relevant markets as well as strategically significant technologies and business segments. Performance-related remuneration systems, modern pension schemes, and advanced training activities counter the risk of losing employees in strategically important positions. In the IT function, security technologies protect against unauthorized access to or misuse of data by internal and external parties. Server and storage systems are set up in such a way that they can be restored at short notice in the event of a disaster and in crisis situations. Defined security standards not only encompass the technical specifications of the hardware and software, but also the functional security structures and organizational provisions. Detailed backup and recovery procedures reduce the risk of severe disruptions, for example, by securing access procedures as well as mirroring and archiving data on a daily basis. With regard to the accounting process, the internal control and risk management system is aimed at ensuring the compliance and effectiveness of accounting and financial reporting. Besides guidelines and principles, the system also includes measures to prevent and uncover reporting errors. The consolidated financial statements are compiled centrally on the basis of data reported by subsidiaries. We guarantee compliance with the MAHLE guidelines by means of systemic controls, specialist advice, and manual checks as well as through the validation of data plausibility by the group accounting function.

## Regulations and legislation

The introduction and implementation of directives alongside organizational and work instructions ensure that statutory requirements are observed. By integrating internal and external experts into the processes from an early stage, we minimize risks and exploit opportunities that could arise, for example, from fiscal, occupational, competition, patent, antitrust, and environmental regulations and legislation as well as from trade rules. Key elements of our compliance structure include the MAHLE Business Code, the global compliance organization, the whistleblower system for internal and external compliance-related communications, as well as the training concept for risk areas relevant to compliance, and preventive measures.

## Overall assessment

Overall, no risks are currently observable that could endanger the continued existence of our group.





In 2020, the global production of passenger cars and light commercial vehicles is likely to continue to decline considerably.



In the light of the worldwide spread of the coronavirus pandemic, there is considerable uncertainty concerning the 2020 business year.



We are driving forward global restructuring measures to safeguard our competitiveness. We are continuing the systematic review of our locations around the world.

# Outlook

## Overall economic development

In its January 2020 report, the International Monetary Fund (IMF) projected global economic growth of 3.3 percent for 2020. At the time of writing, the IMF has departed from its original forecast in view of the spreading global uncertainty surrounding the SARS-CoV-2 coronavirus. Instead, growth is now expected to be lower than in 2019 (2.9 percent). Trade restrictions and growing political instabilities represent further barriers to growth. The following estimates relating to individual regions are based on the IMF's expectations from January 2020.

IMF FORECAST

< 2.9%

global economic growth in 2020

In the euro zone, the economy is likely to grow slightly in 2020. Falling unemployment and the continued loose monetary policy are expected to contribute. Further growth is anticipated in the countries in the west of the European Union, with a slight decline in Spain.

The IMF projects less dynamic growth than in 2019 for the USA. Here, strong domestic demand and full employment are likely to offset higher imports and increasingly strict trade barriers. South America's largest national economy, Brazil, is expected

to continue to expand at around 2 percent in the coming year, driven by rising private demand.

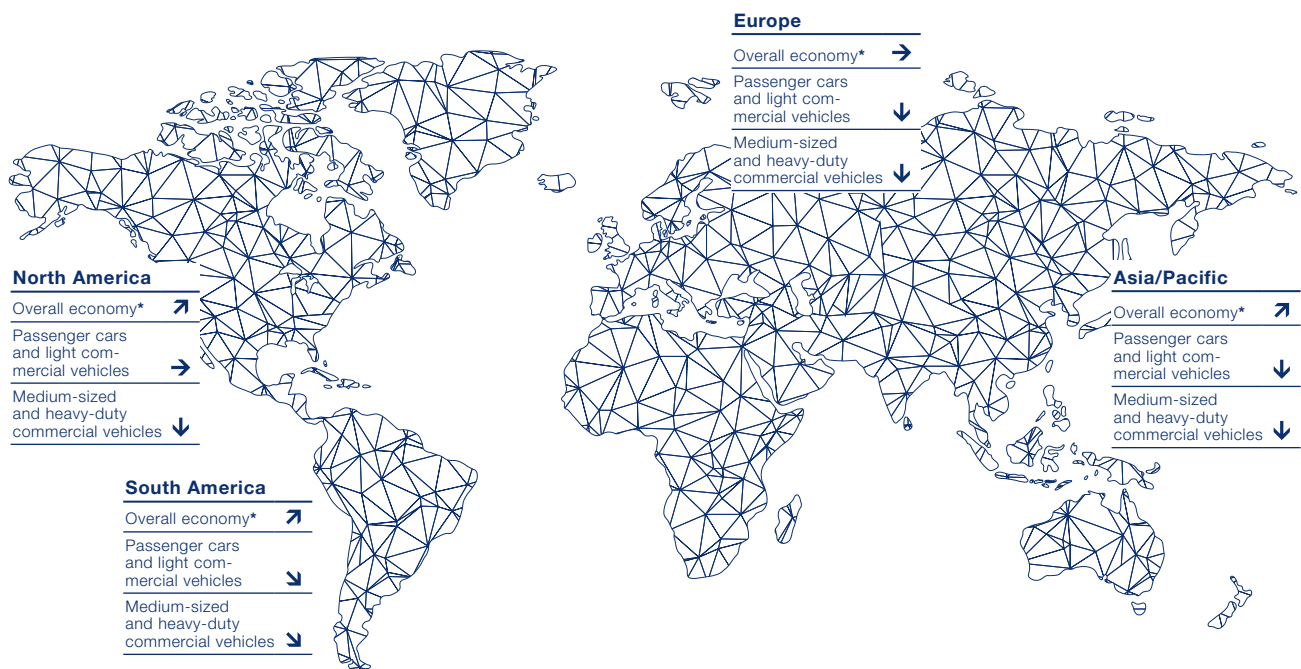
In the Asia/Pacific region, economic growth in China will again probably be lower than in previous years. Aside from the impacts of the SARS-CoV-2 coronavirus, reasons for this include the trade dispute with the United States and increasing national debt. In Japan, the fall in private consumption due to higher consumer taxes is likely to lead to economic output growing somewhat less strongly as well.

## Development of the vehicle markets

In 2020, we expect a further significant fall in the global production of passenger cars and light commercial vehicles. The cyclical decline in the production of medium- and heavy-duty commercial vehicles is expected to continue in 2020 too. Overall, there is great uncertainty regarding the weakening of the global economy, in particular due to the repercussions of the SARS-CoV-2 coronavirus, which are so far difficult to predict. We anticipate that this will have a negative impact on all vehicle markets.

In Europe, we anticipate that the market downturn in the passenger car and light commercial vehicle classes will continue in 2020, and we expect medium-sized and heavy-duty commercial vehicles to experience even greater losses. Ultimately, falling export volumes, the uncertainty associated with Brexit, and shrinking industrial production are hampering the development of the vehicle sector.

In North America, the production of passenger cars and light commercial vehicles is, at best, likely to remain only at the previous year's level as a result of restructuring by major US vehicle manufacturers and due to weaker demand. We even expect a significant cyclical downturn for the medium-sized and heavy-duty



\* IMF forecast from January 2020

commercial vehicle class in 2020, which was already reflected in the declining order intake in the second half of 2019. In South America, we also anticipate a downswing in both vehicle categories.

In the Asia/Pacific region, the Chinese market for passenger cars and light commercial vehicles will probably contract in the year ahead as well. According to current estimates, the impact of the SARS-CoV-2 coronavirus will cause significant declines. In addition, there are possible effects on the supply chain of vehicle parts from China for other markets. A significantly lower production volume than in 2019 is also predicted here in the commercial vehicle sector. Vehicle production in Japan and India is also unlikely to recover substantially in the coming year.

## Development of the MAHLE group

For the 2020 business year, our forecast—prepared before the outbreak of the coronavirus pandemic—projects a flat trend in terms of organic sales development (when adjusted for changes to the consolidation group and exchange rate effects) in view of the volatility and likelihood of continued decline in the automotive markets. We expect a marked improvement in the year ahead with regard to the result from business activities owing to reduced restructuring costs and the successful implementation of rationalization measures.

In the light of the worldwide spread of the coronavirus pandemic, there is considerable uncertainty concerning the 2020 business year. The resulting negative effects on global economic momentum and on the automotive markets in particular are likely to interfere with our production operations and supply chains. Against this backdrop, we plan to make immediate volume adjustments for a phase lasting several weeks, initially beginning at the European locations by using flexitime accounts, reducing holiday entitlements, and introducing short-time work. This turn is expected to impact our sales figures and results that cannot be reliably estimated at the time of preparing this report. We have set up a task force to monitor and evaluate the heightened level of uncertainty on an ongoing basis.

Our aim is to position our company for long-term future success and to safeguard our competitiveness. For this purpose, we are pushing ahead with the global realignment of our group and continuing the systematic review of our locations around the world. We are readying ourselves for continued volatility in the markets, a flagging economic climate, and political uncertainties like trade disputes. Added to this is the considerable effort involved in managing the technological transformation. So far, our intensive audits of our locations and structures have indicated the need to make adjustments, with a focus on production and development locations in Europe.

For example, we will strategically reorganize the production and development location in Rouffach/France with the aim of maintaining the plant's long-term prospects there. It has become

apparent that—despite an extensive package of measures—the location in Öhringen/Germany is no longer able to operate competitively, and it will therefore be closed at the end of 2020. The situation is similar at our plant in Telford/Great Britain. This location is no longer competitive and profitable, as the order situation—which was already in decline—is further impaired by the strategic realignment of the automobile manufacturers located in the area. In addition, a decision has been taken to close the locations of the Italian sister plants in La Loggia and Saluzzo. The two plants produce exclusively diesel engine pistons. With the continuing fall in demand for diesel engines and the vehicle manufacturers' change in strategy, their prospects are no longer sustainable. At our headquarters in Stuttgart, too, adjustments to the staffing level are necessary as part of a cost reduction program. All activity at our research and development center in Foetz/Luxembourg, which specializes in the development of air conditioning compressors, will cease by mid-2021, and this work will be absorbed into other MAHLE locations. Because of the strong trend toward electric vehicles, the integrated product development of the electric compressor is seen as an important factor in our long-term competitiveness. By taking this step, we have laid the appropriate foundations and will continue to strengthen and expand this product segment.

FOCUS FOR

2020

Press ahead with global restructuring measures

Against this background, we combined our expertise in the fields of electronics and mechatronics in a new business unit as at January 1, 2020. This business unit encompasses the former Mechatronics division and the two profit centers Compressors and Pumps. This strategic merger serves as the basis on which we will further increase our innovative strength and create synergies in electric drives, auxiliary components, and electronics. With our new business unit, we are consistently pursuing our dual strategy and clearly focusing on the future business areas for mobility.

In all our business areas and functions, digital technologies support the ongoing development of our group, with the aim of making us more efficient and more innovative as well as helping us to develop new products and business models. To consolidate our digital competence even more strongly in the future, we established the MAHLE Digital Circle. This is a network of employees responsible for digitalization from all business units

and representatives from central functions who coordinate and systematically drive forward our digital strategy as well as ensure transparency of digital activities and projects. The Digital Circle will also support the business areas and central functions in their digitalization tasks, create digital guidelines, and develop digitalization solutions. Additional tasks undertaken by the network will include analyzing trends, monitoring the competition, and enhancing our digital skills. We are pushing the subject of artificial intelligence (AI) forward with equal commitment. A study in August 2019 initially led to the formulation of a definition of AI specific to MAHLE and to practical ideas regarding its application. During the MAHLE AI hackathon in November, seven highly promising options emerged from these ideas and were tested in conjunction with external AI experts. In the next step, we will develop these possible uses further to create pilot projects and implement them together with a project team.

We are pursuing a large number of initiatives with the aim of tapping into new areas of growth. As part of MAHLE Piloting, for example, we run trailblazing pilot projects to gain early access to innovative products and technologies. One such example is our cooperation with the German-Israeli start-up TinyInspektor, in which we purchased shares after the successful conclusion of the pilot project. We want to step up venture capital investments of this kind in the future too, in order to tap into growth areas and develop new ideas and solutions together with start-ups. With the MAHLE Incubator, we empower our employees to identify, analyze, and develop new business ideas, models, and markets. One initiative with origins in the Incubator is our corporate start-up chargeBIG, which has developed an intelligent charge management system for electric vehicles that can be integrated into the existing infrastructure at low cost and without complex conversion work. We are also increasing our focus on so-called project houses, in which experts discuss and work closely together on certain technology topics on a cross-functional and global basis. One of our project houses is currently developing a groundbreaking modular systems portfolio for fuel cell applications.

Our economic success is the foundation on which we implement our future strategies. It enables us to invest in research and development, establish new business areas, and make acquisitions that complement our portfolio. To maintain and enhance a strong base, we are striving for further sales growth while seeking to increase profitability at the same time. Our financial independence and ability to withstand potential crises are always our priorities. We therefore set great store by a healthy balance sheet structure and moderate net gearing. The mainstays of our financial policy are thus a solid equity base and liquidity that is secured over the long term and built on stable operating cash flows as well as diversified financing sources and instruments.

This report contains forward-looking statements that rely on current estimates of future developments and are therefore subject to risks and uncertainties that are beyond our control or precise assessment. Consequently, the actual results may differ from the statements made here.

# Consolidated financial statements



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# Consolidated balance sheet

CONSOLIDATED BALANCE SHEET AS AT DECEMBER 31, 2019

in EUR '000	Dec. 31, 2019	Dec. 31, 2018
<b>ASSETS</b>		
<b>A. Fixed assets</b>		
<b>I. Intangible assets</b>		
1. Purchased concessions, industrial and similar rights and assets, as well as licences in such rights and assets	201,362	223,551
2. Goodwill	277,608	317,688
3. Prepayments	785	611
	<b>479,755</b>	<b>541,850</b>
<b>II. Property, plant, and equipment</b>		
1. Land, leasehold rights, and buildings including buildings on third-party land	940,910	951,255
2. Technical equipment and machinery	1,664,328	1,575,813
3. Other equipment, fixtures, and furniture	158,581	139,695
4. Prepayments and assets under construction	438,594	469,827
	<b>3,202,413</b>	<b>3,136,590</b>
<b>III. Financial assets</b>		
1. Shares in affiliated companies	3,031	2,504
2. Shares in associated companies	41,630	39,114
3. Equity investments	5,347	10,145
4. Loans to companies in which participations are held	90	0
5. Long-term securities	12,445	4,908
6. Other loans	42,832	43,974
	<b>105,375</b>	<b>100,645</b>
	<b>3,787,543</b>	<b>3,779,085</b>
<b>B. Current assets</b>		
<b>I. Inventories</b>		
1. Raw materials, consumables, and supplies	548,313	593,349
2. Work in process	197,836	216,199
3. Finished goods and merchandise	662,704	678,221
4. Prepayments	14,327	14,198
5. Prepayments received	-76,331	-77,503
	<b>1,346,849</b>	<b>1,424,464</b>
<b>II. Receivables and other assets</b>		
1. Trade receivables	1,970,892	1,948,907
2. Receivables from affiliated companies	394	1,054
3. Receivables from companies in which investments are held	3,240	2,212
4. Other assets	411,287	383,127
	<b>2,385,813</b>	<b>2,335,300</b>
<b>III. Securities</b>	<b>77</b>	<b>32</b>
<b>IV. Cash in hand, bank balances, and checks</b>	<b>567,238</b>	<b>407,197</b>
	<b>4,299,977</b>	<b>4,166,993</b>
<b>C. Prepaid expenses</b>	<b>29,524</b>	<b>26,278</b>
<b>D. Deferred tax assets</b>	<b>200,607</b>	<b>235,547</b>
<b>E. Excess of plan assets over post-employment benefit liability</b>	<b>80,270</b>	<b>64,161</b>
	<b>8,397,921</b>	<b>8,272,064</b>

in EUR '000	Dec. 31, 2019	Dec. 31, 2018
<b>EQUITY AND LIABILITIES</b>		
<b>A. Equity</b>		
<b>I. Subscribed capital</b>	150,000	150,000
<b>II. Capital reserves</b>	166,430	166,430
<b>III. Revenue reserves</b>	2,184,852	2,343,108
<b>IV. Equity impact from currency translation</b>	-138,147	-153,307
<b>V. Consolidated unappropriated retained earnings</b>	5,510	13,568
<b>VI. Non-controlling interests</b>	373,805	494,301
	<b>2,742,450</b>	<b>3,014,100</b>
<b>B. Accruals</b>		
1. Accruals for pensions and similar obligations	702,246	657,605
2. Accruals for taxes	64,352	70,000
3. Other accruals	1,492,670	1,378,694
	<b>2,259,268</b>	<b>2,106,299</b>
<b>C. Liabilities</b>		
1. Bonds	830,000	829,000
2. Liabilities to banks	1,077,483	715,521
3. Payments received on account of orders	7,780	6,743
4. Trade payables	1,117,098	1,200,471
5. Liabilities on bills accepted and drawn	49,388	41,186
6. Liabilities to affiliated companies	1,216	1,121
7. Liabilities to companies in which investments are held	3,914	4,900
8. Other liabilities	246,560	286,379
<i>thereof from taxes: 88,475 (prev. yr.: 82,302)</i>		
<i>thereof relating to social security and similar obligations: 33,960 (prev. yr.: 32,705)</i>		
	<b>3,333,439</b>	<b>3,085,321</b>
<b>D. Deferred income</b>	62,764	66,344
	<b>8,397,921</b>	<b>8,272,064</b>





# Consolidated income statement

CONSOLIDATED INCOME STATEMENT FROM JANUARY 1 TO DECEMBER 31, 2019

in EUR '000	2019	2018
<b>1. Sales</b>	<b>12,049,163</b>	<b>12,580,768</b>
2. Cost of Sales	-10,135,690	-10,343,944
<b>3. Gross profit on sales</b>	<b>1,913,473</b>	<b>2,236,824</b>
4. Selling expenses	-560,236	-597,311
5. General administrative expenses	-519,865	-511,938
6. Research and development expenses	-750,754	-750,798
7. Other operating income	346,271	771,842
<i>thereof from currency translation: 121,356 (prev. yr.: 188,488)</i>		
8. Other operating expenses	-315,149	-362,582
<i>thereof from currency translation: -129,076 (prev. yr.: -232,670)</i>		
	-1,799,733	-1,450,787
	<b>113,740</b>	<b>786,037</b>
9. Investment income	81	1,118
<i>thereof from affiliated companies: 11 (prev. yr.: 41)</i>		
10. Income from other securities and long-term loans	1,801	149
11. Result from associated companies	6,709	-2,417
12. Other interest and similar income	23,661	9,889
<i>thereof from affiliated companies: 12 (prev. yr.: 10)</i>		
<i>thereof income from discounting: 66 (prev. yr.: 251)</i>		
13. Impairment of financial assets and of securities	-3,292	-27,444
14. Interest and similar expenses	-132,988	-153,133
<i>thereof to affiliated companies: -11 (prev. yr.: -10)</i>		
<i>thereof expenses from discounting: -53,201 (prev. yr.: -64,489)</i>		
	-104,028	-171,838
<b>Result from business activities</b>	<b>9,712</b>	<b>614,199</b>
15. Taxes on income	-189,453	-135,700
<i>thereof expense from deferred income taxes: -28,716 (prev. yr.: income 35,878)</i>		
<b>16. Result after taxes</b>	<b>-179,741</b>	<b>478,499</b>
17. Other taxes	-31,806	-32,138
<b>18. Consolidated net loss/net income</b>	<b>-211,547</b>	<b>446,361</b>
19. Consolidated unappropriated retained earnings prior year	13,568	7,594
20. Dividend distribution	-13,400	-7,500
21. Withdrawal from/Transfer to revenue reserves	161,031	-304,450
22. Profit applicable to non-controlling interests	-78,616	-205,439
23. Loss applicable to non-controlling interests	134,474	77,002
<b>24. Consolidated unappropriated retained earnings</b>	<b>5,510</b>	<b>13,568</b>

# Consolidated cash flow statement

CONSOLIDATED CASH FLOW STATEMENT FROM JANUARY 1 TO DECEMBER 31, 2019

in EUR '000

2019

## 1. Cash flows from operating activities

Profit for the period (consolidated net loss including profit and loss applicable to non-controlling interests)	-211,547
+/- Depreciation, amortization, and write-downs of fixed assets/reversals of write-downs of fixed assets	619,233
+/- Increase/decrease in provisions	-89,019
+/- Other non-cash expenses/income	-17,963
-/+ Increase/decrease in inventories, trade receivables, and other assets not related to investing or financing activities	109,182
+/- Increase/decrease in trade payables and other liabilities not related to investing or financing activities	-90,356
-/+ Gain/loss on disposal of fixed assets	-4,008
+/- Interest expense/interest income	90,861
- Other investment income	-6,791
+/- Expenditure/income of exceptional size or incidence	161,771
+/- Interest payments/receipts related to interest other than for the provision of capital	424
+/- Income tax expense/income	160,737
- Cash payments relating to expenditure of exceptional size or incidence	-35,870
-/+ Income taxes paid	-172,941
	<b>513,713</b>

## 2. Cash flows from investing activities

+ Proceeds from disposal of intangible fixed assets	100
- Payments to acquire intangible fixed assets	-13,425
+ Proceeds from disposal of tangible fixed assets	28,286
- Payments to acquire tangible fixed assets	-548,907
+ Proceeds from disposal of long-term financial assets	2,257
- Payments to acquire long-term financial assets	-4,987
+ Proceeds from disposals of entities included in the basis of consolidation	998
- Payments to acquire entities included in the basis of consolidation	-65,953
+ Cash receipts from the investment of cash funds for short-term cash management	144,962
- Cash payments for the investment of cash funds for short-term cash management	-157,555
+ Interest received	5,348
+ Dividends received	1,204
	<b>-607,672</b>

in EUR '000	2019
<b>3. Cash flows from financing activities</b>	
+ Proceeds from capital contributions by minority shareholders	229
+ Proceeds from the issuance of bonds and from borrowings	621,978
- Cash repayments of bonds and borrowings	-232,462
+ Proceeds from grants / subsidies received	3,096
- Interest payment due to leasing agreements	-23
- Interest paid	-50,371
- Dividends paid to shareholders of the parent entity	-13,400
- Dividends paid to minority shareholders	-25,695
	<b>303,352</b>
<b>4. Cash funds at end of period</b>	
Net change in cash funds (subtotals 1-3)	209,393
+/- Effect on cash funds of exchange rate movements and remeasurements	-20,324
+/- Effect on cash funds of changes in the basis of consolidation	0
+ Cash funds at beginning of period	239,746
	<b>428,815</b>
Cash in hand, bank balances, and checks	407,197
- Bank balances with an initial term of more than 3 months	-4,139
+ Liabilities to banks with an initial term of less than 3 months	-163,312
<b>Cash funds at beginning of period</b>	<b>239,746</b>
<i>thereof from quota-consolidated entities</i>	-8,771
Cash in hand, bank balances, and checks	567,238
- Bank balances with an initial term of more than 3 months	-4,026
+ Liabilities to banks with an initial term of less than 3 months	-134,397
<b>Cash funds at end of period</b>	<b>428,815</b>
<i>thereof from quota-consolidated entities</i>	1,878

The short term liabilities which were netted against cash balances contained EUR 89,659k (previous year: EUR 110,768k) which were related to short term liabilities based on a committed credit line with a remaining tenor of more than one year.

Cash funds amounting to EUR 351k that are restricted on disposal are included.

# Consolidated statement of changes in equity

CONSOLIDATED STATEMENT OF CHANGES IN EQUITY FROM JANUARY 1 TO DECEMBER 31, 2019

in EUR '000	PARENT COMPANY		
	Subscribed capital	Capital reserves	Revenue reserves
<b>As at December 31, 2017</b>	<b>150,000</b>	<b>166,430</b>	<b>2,039,704</b>
Capital increase	0	0	0
Transfer to revenue reserves	0	0	304,450
Dividend distribution	0	0	0
Currency translation	0	0	0
Other items	0	0	23
Changes in the consolidation group	0	0	-1,069
Consolidated net income	0	0	0
<b>As at December 31, 2018</b>	<b>150,000</b>	<b>166,430</b>	<b>2,343,108</b>
Capital increase	0	0	0
Withdrawal from revenue reserves	0	0	-161,031
Dividend distribution	0	0	0
Currency translation	0	0	0
Other items	0	0	2,775
Changes in the consolidation group	0	0	0
Consolidated net loss	0	0	0
<b>As at December 31, 2019</b>	<b>150,000</b>	<b>166,430</b>	<b>2,184,852</b>

<sup>1</sup> Including effects from hyperinflation adjustments for the country Argentina in accordance with GAS 25



	Equity impact from currency translation <sup>1</sup>	Consolidated unappropriated retained earnings	Total	Non-controlling interests <sup>1</sup>	Consolidated equity
	<b>-169,564</b>	<b>7,594</b>	<b>2,194,164</b>	<b>437,940</b>	<b>2,632,104</b>
	0	0	0	172	172
	0	-304,450	0	0	0
	0	-7,500	-7,500	-27,387	-34,887
	15,669	0	15,669	-10,690	4,979
	-481	0	-458	-54,204	-54,662
	1,069	0	0	20,033	20,033
	0	317,924	317,924	128,437	446,361
	<b>-153,307</b>	<b>13,568</b>	<b>2,519,799</b>	<b>494,301</b>	<b>3,014,100</b>
	0	0	0	267	267
	0	161,031	0	0	0
	0	-13,400	-13,400	-25,995	-39,395
	17,948	0	17,948	2,923	20,871
	-2,788	0	-13	-41,859	-41,872
	0	0	0	26	26
	0	-155,689	-155,689	-55,858	-211,547
	<b>-138,147</b>	<b>5,510</b>	<b>2,368,645</b>	<b>373,805</b>	<b>2,742,450</b>

# Notes to the consolidated financial statements

## General information

The present consolidated financial statements of MAHLE GmbH are prepared in accordance with Sec. 290 et seq. of the German Commercial Code (HGB).

## Consolidation group

The consolidated financial statements include MAHLE GmbH (parent company), headquartered in Stuttgart/Germany and registered with the district court in Stuttgart (commercial register number 638), as well as 24 domestic and 131 foreign subsidiaries. Furthermore, 18 companies were consolidated proportionately according to the percentage of shares, and eight companies were valued according to the equity method. The consolidated companies are included in the list of shareholdings.

During 2019, the following company was fully consolidated for the first time due to its acquisition:

- MAHLE ZG Transmissions GmbH, Germany, as of January 4

In addition, the following company was fully consolidated for the first time due to the acquisition of additional shares. In the previous years this company was excluded from the valuation according to the equity method due to its immateriality:

- MAHLE Electric Drives India Private Limited (formerly: Letrika Roots Private Limited), India, as of August 31

The acquisitions did not affect the comparability of the consolidated financial statements with the previous year.

The following companies were newly incorporated and fully consolidated for the first time during 2019:

- MAHLE Blechtechnologie GmbH, Germany, as of July 1
- MAHLE Behr (Thailand) Co., Ltd., Thailand, as of August 22

The following proportionately consolidated company was included for the first time during 2019:

- Ningde MAHLE Automotive Thermal Systems Co. Ltd. China, as of July 1

Five companies were merged in the reporting year.

Two fully consolidated companies were liquidated in the business year 2019.

In the business year, ten companies were excluded from the consolidated financial statements due to immateriality. Two companies were not valued according to the equity method due to their immateriality.

### Key changes to the consolidation group

During 2019, no significant changes occurred within the consolidation group.

## Exemption provisions for domestic companies

The following subsidiaries are applying the exemption according to Sec. 264, paragraph 3, respectively Sec. 264b HGB, with regard to the disclosure of their annual financial statements and/or the preparation of the management reports:

MAHLE Aftermarket GmbH, Stuttgart; MAHLE Amovis GmbH, Berlin; MAHLE Beteiligungen GmbH, Stuttgart; MAHLE Blechtechnologie GmbH, Stuttgart; MAHLE Brandenburg GmbH, Wustermark; MAHLE Filtersysteme GmbH, Stuttgart; MAHLE Immobilien GmbH, Stuttgart; MAHLE Industrial Thermal Systems GmbH & Co. KG, Stuttgart; MAHLE Industriebeteiligungen GmbH, Stuttgart; MAHLE Industriebetrieb-Komponenten GmbH, Stuttgart; MAHLE International GmbH, Stuttgart; MAHLE Kleinmotoren-Komponenten GmbH & Co. KG, Stuttgart; MAHLE Powertrain GmbH, Stuttgart; MAHLE Ventiltrieb GmbH, Stuttgart; MAHLE Versicherungsvermittlung GmbH, Stuttgart.

## Method of consolidation

Consolidated subsidiaries, using the book value method prior to December 31, 2009, will continue to be consolidated under the same method as in prior years. Thereby, the value of the investment held by the parent company, at the time of acquisition and first consolidation, is to be offset against the attributable share of the subsidiary's equity book value. In the case of companies that were consolidated for the first time from 2010 onward, the assets, liabilities, prepaid expenses, and deferred income acquired were revalued at fair value as part of the purchase price allocation at the time that the company became a subsidiary.

As at the balance sheet date, total goodwill of EUR 277,608k is disclosed, which contains goodwill of EUR 36,114k that occurred in the financial statements of the entities included in the consolidation group. Goodwill is amortized over ten years due to the relevant markets that are dominated by a small number of suppliers and have high barriers to market entry. These markets have shown that the average useful life of acquired goodwill is historically ten years. Additionally, the recoverability of goodwill is tested (impairment test) at least once a year to determine if an impairment exists according to GAS 23.129, sentence 1. Thereby, the amount of the write-down is determined by comparing the fair value of the investment in the subsidiary with the total of the carrying amount of the net assets held by the subsidiary in the consolidated financial statements and the net carrying amount of goodwill. In 2019, no goodwill impairments were necessary.

The first consolidation of MAHLE ZG Transmissions GmbH resulted in goodwill of EUR 3,752k and the first consolidation of MAHLE Electric Drives India Private Limited (formerly: Letrika Roots Private Limited) in goodwill of EUR 435k. In addition, MAHLE Beteiligungen GmbH increased its shareholding in MAHLE Behr GmbH & Co. KG from 55.71 to 60.71 percent and its shareholding in MAHLE Behr Verwaltung GmbH from 55.71 to 60.71 percent as at January 1, 2019, through the acquisition of shares from non-controlling shareholders. This resulted in badwill of EUR 2,070k. This badwill was completely released in 2019 according to the incurred expenses from the restructurings considered in the purchase price.

Thereby, the increase in shares in subsidiaries without affecting their status as subsidiaries was recognized as acquisition.

The intra-group supply of goods and services as well as mutual receivables and liabilities were offset, and intercompany profits and losses were eliminated.

Deferred taxes resulting from consolidation measures with effect on income were recorded using a tax rate of 22 percent.

## Accounting and valuation principles

The existing accounting and valuation methods were retained.

Acquired intangible assets and property, plant, and equipment are valued at acquisition costs or manufacturing costs minus depreciation or amortization. Depreciation was performed on a straight-line basis using standard useful lives. If lower valuations were provided, impairments were recorded. Internally developed trademarks and similar rights and assets were not capitalized. Furthermore, the intangible assets contain hidden reserves disclosed as part of the purchase price allocation of the acquisitions. These comprise trademark rights, customer relationships, technological licenses, and development services. Depending on the categories, the useful lives for intangible assets were based on five to ten years.

Financial assets were stated at the lower of acquisition cost or fair value if the impairment is expected to be permanent.

Inventories are capitalized at acquisition cost or manufacturing cost. Unfinished and finished goods are valued by considering the appropriate share of material, production overhead, and depreciation of fixed assets. If the market prices or fair values were lower than the book values, or marketability was limited, devaluations were performed as necessary.

Receivables and other assets are recorded at nominal values. Appropriate write-downs are recorded to account for receivables with recognizable risks of nonpayment; a general valuation allowance is set up to cover the general credit risk.

Prepaid expenses were recorded for payments made before the balance sheet date for expenditures related to a specific time period after this date.

Accruals for taxes and other accruals are to adequately cover uncertain liabilities and anticipated losses from pending transactions. The valuation is based on the settlement amount taking into account necessary cost increases. Accruals with a remaining term of more than one year were discounted by using the average market interest rate of the past seven fiscal years provided by the German Central Bank. If appropriate, an average local market interest rate of the past seven years was determined for the remaining term in order to depict the actual economic situation for the discounting of obligations in foreign currency.

Accruals for pensions and similar obligations are calculated group-wide in accordance with actuarial principles (using the projected unit credit method) and discounted with the average rate of ten years in accordance with Sec. 253 HGB to present value.

In 2019, the calculation was based on the following discount rates: domestic 2.22 to 2.86 percent; foreign 0.80 to 4.63 percent. The option to assume a standardized remaining term of 15 years was not utilized. Expected salary increases of 1.50 to 5.42 percent and anticipated labor turnover rates of 2.00 to 5.05 percent were taken into consideration. The mortality tables recognized in each country were used as a basis for the calculation.

Assets that serve exclusively to settle pension-related obligations and cannot be utilized to settle claims of any other creditors (plan assets in the form of long-term securities) were offset against the accruals at their fair value. Excess amounts are recorded within the item "Excess of plan assets over post-employment benefit liability."

Liabilities are stated at their settlement amount.

Receivables, bank balances, and liabilities in foreign currency with a remaining term of less than one year were valued using the mid spot rate applicable at the balance sheet date. If the remaining term was more than one year, the valuation was based on the exchange rate applicable at the acquisition date or the lower or higher exchange rate at the balance sheet date.

Changes in exchange rates, commodity price variations, and interest rates represent a risk to operational business that is very difficult to estimate. To minimize this risk, appropriate hedging

transactions such as derivatives are used. These transactions are only established with banks that have a prime credit rating. Their use is based on standard guidelines, subject to strict internal controls, and restricted to the hedging of operational business as well as that of related investments and financing activities.

If effective hedging relationships existed between the underlying operating transactions and/or highly probable transactions (basically future deliveries of goods and services) and the currency or interest hedging transaction, they were combined into a hedge accounting evaluation unit and valuated together under the so-called "net hedge presentation method" ("Einfrierungsmethode").

Deferred income has been recorded for payments received prior to the balance sheet date for income related to a specific time period after this date.

Deferred tax assets and liabilities are set up to account for all temporary and quasi-permanent differences between the tax and German Commercial Code (HGB) values. Furthermore, deferred taxes for tax loss and interest carry forwards and tax credits were capitalized, provided the tax benefit was reasonably recoverable within the next five years. Deferred taxes were determined using tax rates that are expected to apply at the time of recovery and are based on the regulations adopted at the balance sheet date. Deferred tax assets and liabilities are presented as a net value. The tax rates fall within a range of 10.00 to 34.00 percent.

## Currency conversion

The financial statements of foreign companies were, if not prepared in Euro, converted as follows:

### Equity:

In accordance with the regulations of GAS 25

### Other balance sheet items:

Mid spot rate at the balance sheet date

### Income statement items:

Average exchange rate for the year

Exchange rate differences in connection with the use of the closing rate method were shown as "Currency translation Jan. 01" within the consolidated statement of fixed assets. Differences arising from the conversion of movements during the current year were shown in a separate column.

Any difference arising from the translation of the balance sheet items into Euro was included under "Equity impact from currency translation" in the consolidated shareholders' equity.

The "thereof" information on currency conversion in the income statement includes both unrealized and realized exchange rate differences.

For the company in the hyperinflation country Argentina, the financial statements were prepared based on a general price index in accordance with GAS 25.

## Notes to the consolidated balance sheet

### Receivables and other assets

in EUR '000	Dec. 31, 2019	
	Carrying amount	Thereof with a remaining term of more than 1 year
Accounts receivables		
Trade receivables	1,970,892	1,699
Receivables from affiliated companies	394	0
Receivables from companies in which investments are held	3,240	0
Other assets	411,287	15,382
<b>Total</b>	<b>2,385,813</b>	<b>17,081</b>

During the previous year, trade receivables (EUR 2,207k) as well as other assets (EUR 12,211k) had a remaining term of more than one year.

Trade receivables are included in the amount of EUR 243k (previous year: EUR 152k) from affiliated companies and EUR 1,078k (previous year: EUR 1,482k) from companies in which investments are held.

Only other assets contain receivables against shareholders amounting to EUR 47k (previous year: EUR 6k). Prepaid expenses include, among others, the differences between net loan proceeds and liabilities to banks (debt discounts) amounting to EUR 702k (previous year: EUR 1,046k).

### Equity

The consolidated unappropriated retained earnings equal that of the parent company and contain the amount carried forward from the previous year of EUR 168k.

### Accruals for pensions and similar obligations as well as other accruals

Notes for offsetting pursuant to Sec. 246, paragraph 2, sentence 2 HGB:

in EUR '000	Dec. 31, 2019
	Carrying amount
Settlement amount of offset liabilities	555,186
Acquisition costs of assets	238,361
Fair value of assets	395,932
Offset income	39,850
Offset expenses	33,486

The difference for discounting with the seven-year average rate according to Sec. 253, paragraph 6, sentence 1 HGB amounts to EUR 81,047k.

Other accruals primarily relate to outstanding credit notes and rebates and outstanding purchase invoices, guarantee and warranty risks as well as obligations arising from restructuring and employment contracts.



## Liabilities

in EUR '000	Dec. 31, 2019			
	Carrying amount	With a remaining term of up to 1 year	With a remaining term of more than 1 year	Thereof with a remaining term of more than 5 years
Bonds	830,000	0	830,000	0
Liabilities to banks	1,077,483	215,214	862,269	273,610
Payments received on account of orders	7,780	7,773	7	0
Trade payables	1,117,098	1,116,388	710	0
Liabilities on bills accepted and drawn	49,388	49,388	0	0
Liabilities				
<i>to affiliated companies</i>	1,216	1,216	0	0
<i>to companies in which investments are held</i>	3,914	3,914	0	0
Other liabilities	246,560	214,924	31,636	11,913
<b>Total</b>	<b>3,333,439</b>	<b>1,608,817</b>	<b>1,724,622</b>	<b>285,523</b>

During the previous year, bonds (EUR 29,000k), liabilities to banks (EUR 185,298k), payments received on account of order (EUR 6,736k), trade payables (EUR 1,199,131k), liabilities on bills accepted and drawn (EUR 41,186k), liabilities to affiliated companies (EUR 1,121k), liabilities to companies in which investments are held (EUR 4,900k), and other liabilities (EUR 253,724k) had a remaining term of up to one year.

The liabilities to affiliated companies contain trade payables of EUR 487k (previous year: EUR 239k). The liabilities to companies in which investments are held contain trade payables of EUR 1,207k (previous year: EUR 1,564k).

The liabilities contain no payables to shareholders (previous year: EUR 7k).

Bank liabilities in the amount of EUR 43k (previous year: EUR 0k) are secured by property liens or similar rights.

### Deferred taxes

Deferred tax assets arise predominantly from differing accounting treatment in intangible assets, property, plant, and equipment, and accruals. The temporary differences in accruals essentially include different carrying amounts between the tax balance sheet and the consolidated balance sheet related to accruals for pensions and similar obligations and accruals that are not tax-deductible, such as accruals for anticipated losses.

The deferred tax liabilities result predominantly from temporary differences relating to tangible fixed assets due to different carrying amounts and depreciation methods in the tax and consolidated balance sheet. In addition, the identified fair values disclosed as part of the purchase price allocations of the acquisitions lead to deferred tax liabilities, in particular in intangible fixed assets.

Deferred tax assets of EUR 84,748k were set up for tax loss carry forwards of EUR 393,336k that are recoverable within five years. EUR 238,737k of deferred tax assets were written off as at December 31, 2019, as their realization is not deemed sufficiently likely.

## Off-balance-sheet transactions

As of the balance sheet date, off-balance-sheet transactions exist in connection with significant rental and leasing agreements in particular for buildings and land (EUR 166,427k). Moreover, off-balance-sheet transactions are in place in connection with factoring (EUR 29,931k). These off-balance-sheet transactions led to a diversification of financing sources as at the balance sheet date. Through these transactions cash outflows are generally postponed into the future.

No material risks are anticipated from these transactions.

## Contingent liabilities

in EUR '000	Dec. 31, 2019
	Carrying amount
Contingents from notes	34,663
Guarantees	200
Warranties	154

To our knowledge, the underlying obligations can be fulfilled in all cases by the companies concerned. We do not expect the contingent liabilities to be claimed. The contingent liabilities include EUR 20,368k from proportionately consolidated companies.

The contingent liabilities do not include any obligations concerning retirement benefits.

## Other financial obligations

in EUR '000	Dec. 31, 2019
	Carrying amount
Purchase commitments from investments	258,266
Financial obligations resulting from rent and lease agreements	71,370
Others	57,084
<i>thereof to affiliated companies</i>	<i>155</i>

The other financial obligations include EUR 13,050k from proportionately consolidated companies.

The other financial obligations do not include any obligations concerning retirement benefits.

## Contribution of proportionately consolidated companies

The balance sheet includes short-term assets of EUR 311,397k and long-term assets of EUR 144,577k belonging to proportionately consolidated companies. Current liabilities of EUR 184,936k as well as long-term debt of EUR 98,133k are recognized by proportionately consolidated companies.

## Notes to the consolidated income statement

The income statement of the MAHLE Group has been prepared according to the cost of sales method. Sales are thus matched with the expenses incurred in their realization, which are allocated in principle to the Production, Sales, General Administration, and Research and Development functions.

The cost of sales comprises of the material and production costs incurred in the realization of sales, the landed costs of the trade business, and the costs of the allocation to accruals for warranties. Furthermore, this item also contains depreciation and amortization on the hidden reserves disclosed as part of the purchase price allocations of the acquisitions. These include technologies, technical equipment and machinery as well as land and buildings.

The selling expenses include, in particular, personnel and non-personnel expenses, depreciation allocated to the Sales function, as well as logistics, market research, sales promotion, shipping and handling, and advertising costs. Furthermore, they also contain amortization on the hidden reserves disclosed as part of the purchase price allocations of the acquisitions. These include trademark rights and customer relationships.

The general administration expenses include personnel and non-personnel expenses as well as depreciation allocated to the General Administration function.

The personnel, and non-personnel expenses, and depreciation allocated to the research and development function are of substantial significance to the MAHLE Group. In order to present the economic situation of the group more clearly, they have been included as a separate item in the breakdown.

Other operating income contains EUR 130,728k income related to other periods. This income is mainly related to the reversal of accruals. Income from financing includes gains of EUR 25,275k (previous year: EUR 39,686k) from currency translation and gains of EUR 43k (previous year: EUR 0k) from derivative financial instruments.

Other operating expenses contain EUR 6,434k expenses relating to other periods. These expenses are mainly related to disposals of depreciable fixed assets. Expenses from financing include losses of EUR 32,354k (previous year: EUR 87,438k) from currency translation and expenses of EUR 3,474k (previous year: EUR 266k) from derivative financial instruments.

In the previous year, other operating expenses contained expenses from SWAP premium for hedged foreign currency loans in the amount of EUR 27,844k which were disclosed as losses from the currency translation. In 2019, the disclosure of the SWAP premium for hedged foreign currency loans is reported within the interest expenses.

## Sales by area of operation

in EUR '000	2019
Engine Systems and Components business unit	2,617,402
Filtration and Engine Peripherals business unit	2,092,227
Thermal Management business unit	4,556,564
Aftermarket business unit	949,592
Mechatronics division	491,727
Profit centers and services	1,341,651
<b>Total</b>	<b>12,049,163</b>

## Sales by geographical market (target area)

in EUR '000	2019
Europe	5,333,195
North America	3,603,214
South America	478,365
Asia/Pacific	2,532,128
Africa	102,261
<b>Total</b>	<b>12,049,163</b>

## Personnel expenses

in EUR '000	2019
Wages and salaries	2,575,144
Social security costs and other benefits	527,243
Old age pension costs	54,345
<b>Total</b>	<b>3,156,732</b>

## Depreciation, amortization, and impairments of intangible and tangible fixed assets

in EUR '000	2019
<b>Total</b>	<b>616,089</b>
<i>thereof impairments</i>	10,555

## Subsequent valuation of the purchase price allocation for the acquisitions\*

in EUR '000	2019
Depreciation and amortization within cost of sales	66,808
Amortization within selling expenses	7,064
Release of subsidies within other operating income	9,662

\* Concerns MAHLE Behr, former Delphi Thermal entities, MAHLE Electric Drives, MAHLE Electronics, and former BRAIN BEE entities

## Contribution of proportionately consolidated companies

The income statement includes income of EUR 663,945k and expenses of EUR 632,994k of proportionately consolidated companies.

## Other notes

### Average annual number of employees\*

	2019
Direct employees	42,337
Indirect employees	35,402
<b>Total</b>	<b>77,739</b>

\* Excluding apprentices

The total average annual number of employees includes a pro rata figure of 2,473 employees from proportionately consolidated companies.

## Derivatives

Derivatives in accordance with Secs. 285 and 314 HGB not yet settled as at the balance sheet date can be broken down as follows:

in EUR '000	Dec. 31, 2019	Dec. 31, 2019
	Nominal amounts*	Fair value**
Transactions relating to interest	2,287	-47
Transactions relating to currency	2,037,636	9,297
Transactions relating to commodities	14,682	-177

\* The nominal amounts of the derivative financial instruments are based on absolute values, i.e. long and short positions are added with their nominal values.

\*\* The fair value of currency and commodity related transactions corresponds to the market value of the derivatives as at the balance sheet date, which is identified in accordance with the net present value method. All interest related transactions are based on recognized financial/mathematical models.

The derivative contracts as at December 31, 2019 are placed in relation to third parties exclusively with banks. Evaluation units were established for currency and interest hedging transactions with an effective relationship to the underlying transaction. Accruals of EUR 711k were set up for all other hedging transactions that have resulted in anticipated losses.

## Evaluation units

For two intercompany loans in transaction currency USD an evaluation unit was created with USD Schuldscheindarlehen (German private placement loan) with identical amounts and matching maturities (natural hedge). As the positions are counter-vailing the effectiveness of the hedging relationship is ensured. The volume in transaction currency is USD 213,000k.

The following evaluation units were created from derivatives and are shown with their netted values:

in EUR '000	Type of evaluation unit	Dec. 31, 2019	Balance sheet item
		Amount of hedged transaction	
<b>Currency exposure</b>			
Recorded values	Portfolio Hedge	93,421	Trade receivables
	Portfolio Hedge	13,590	Bank balances
	Portfolio Hedge	-12,270	Liabilities to banks
	Portfolio Hedge	-67,960	Trade payables
Remaining currency exposure from eliminated transactions with affiliated companies	Portfolio Hedge	580,560	
Future transactions	Portfolio Hedge	-4,141	

	Dec. 31, 2019
	Volume of hedges
Currency exposure in transaction currency	in '000
CAD	22,363
CNY	76,052
CZK	-92,632
EUR	4,578
GBP	13,137
HUF	-6,010,000
JPY	5,910,689
MXN	104,132
PLN	-55,500
RON	50,314
RUB	-929,997
THB	-346,180
TRY	33,466
USD	-739,749

The changes in value in the underlying and hedging transactions are offset during the hedging horizon, since risk positions (underlying transactions recognized on the balance sheet) are immediately hedged by means of forward exchange transactions of the same amount, in the same currency, and with the same maturity period in accordance with the guidelines of the group risk management.

The risk of potential future changes in cash flows arising from highly probable underlying transactions, basically future deliveries of goods and services, is offset by using hedging transactions. The hedge ratio of such future transactions is reduced over time; the further such transactions are in the future. The hedging horizon for currency related hedging transactions that are included in hedge accounting relationships is generally two years. Past experience has shown that this strategy has led to an effective hedging of cash flows in forecast evaluation units.

The hedging quota of a planned exposure increases over its lifetime. When the planned exposure finally turns into a booked exposure it will have been hedged fully via consecutive individual hedging steps. At this stage, the exposure is hedged via a portfolio of individual hedges that have been added gradually over time. At any given point in time, a number of individual booked exposures can mature, each with their own portfolio of hedges covering the exposure. The entirety of several booked exposures with their respective hedges creates a portfolio hedge.

The "critical term match method" is used to measure the effectiveness of the hedging relationship.

### Report on post-balance sheet date events

No further events with a retroactive effect on the consolidated financial statements occurred after the end of the reporting period.

As of January 1, 2020 MAHLE Beteiligungen GmbH increased its share in MAHLE Behr GmbH & Co. KG and MAHLE Behr Verwaltung GmbH to 65.71 percent each through the acquisition of shares from other shareholders.

MAHLE Behr Service GmbH acquires all the shares in Behr Hella Service GmbH, its current joint venture with Hella, as of January 1, 2020.

As of January 16, 2020 MAHLE Behr GmbH & Co. KG entered into an out-of-court settlement agreement with an insurance consortium for a claim compensation.

In the light of the worldwide spread of the coronavirus pandemic, there is considerable uncertainty concerning the 2020 business year. The resulting negative effects on global economic momentum and on the automotive markets in particular are likely to interfere with our production operations and supply chains. This may in turn have impacts on our sales figures and results that cannot be reliably estimated at the time of preparing this report.



## Appropriation of earnings

### Unappropriated retained earnings

in EUR '000	2019
Net income MAHLE GmbH	30,442
Transfer to revenue reserves	-25,100
Amount carried forward from prior year	168
<b>Unappropriated retained earnings MAHLE GmbH</b>	<b>5,510</b>

### Proposed utilization of retained earnings

in EUR '000	2019
Unappropriated retained earnings	5,510
Dividend distribution to MAHLE-Stiftung GmbH	-5,340
<b>Carry forward to new account</b>	<b>170</b>

### Remuneration of the members of the Management Board of MAHLE GmbH (parent company)

in EUR '000	2019
Supervisory Board	797
Management Board	5,825

The total remuneration of the Management Board comprises fixed and variable components. The fixed portions for 2019 amounted to EUR 4,162k and the variable compensation for 2019 to EUR 2,430k. The remuneration shown also includes an adjustment for the previous year. The fixed portions include benefits in kind, which consist primarily of the noncash benefits of having company cars.

Remunerations paid to former members of the Management Board and their descendants totaled EUR 1,854k.

An amount of EUR 27,688k is set aside for this group of persons in the pension accrual as at December 31, 2019.

### Auditor's fee

The total auditor's fee recorded as expense for 2019 for the group auditor PricewaterhouseCoopers GmbH, pursuant to Sec. 314, paragraph 1, number 9 HGB consists of the following:


in EUR '000	2019
Services for audit of financial statements	1,019
Other assurance services	3
Tax advisory services	403
Other services	14
<b>Total</b>	<b>1,439</b>

Stuttgart/Germany, March 20, 2020

The Management Board of MAHLE GmbH

  
Dr. Jörg Stratmann

  
Georg Dietz

  
Bernd Eckl

  
Wilhelm Emperhoff

  
Anke Felder

  
Michael Frick

  
Martin Weidlich

# Consolidated statement of fixed assets

CONSOLIDATED STATEMENT OF FIXED ASSETS FROM JANUARY 1 TO DECEMBER 31, 2019

in EUR '000	Acquisition/manufacturing costs							Dec. 31, 2019	
	BUSINESS YEAR 2019								
	Jan. 1, 2019	Jan. 1, 2019	Changes at the Group	Additions	Disposals	Reclassifications	Currency translation of current year <sup>3</sup>		
	Accumulated acquisition/manufacturing costs	Currency translation						Accumulated acquisition/manufacturing costs	
<b>I. Intangible assets</b>									
	1. Purchased concessions, industrial and similar rights and assets, as well as licences in such rights and assets	854,010	189	244	58,301	215,025	648	175	698,542
	2. Goodwill	482,787	0	4,190	4,938	10,904	0	0	481,011
	3. Prepayments	611	-1	0	293	33	-84	-1	785
		<b>1,337,408</b>	<b>188</b>	<b>4,434</b>	<b>63,532</b>	<b>225,962</b>	<b>564</b>	<b>174</b>	<b>1,180,338</b>
<b>II. Property, plant, and equipment</b>									
	1. Land, leasehold rights, and buildings including buildings on third-party land	1,661,198	17,588	0	16,077	11,587	29,215	859	1,713,350
	2. Technical equipment and machinery	5,618,994	34,119	380	164,601	306,696	301,100	8,895	5,821,393
	3. Other equipment, fixtures, and furniture	468,289	4,744	399	46,226	20,395	16,709	404	516,376
	4. Prepayments and assets under construction	478,344	3,649	38	322,389	7,485	-347,588	29	449,376
		<b>8,226,825</b>	<b>60,100</b>	<b>817</b>	<b>549,293</b>	<b>346,163</b>	<b>-564</b>	<b>10,187</b>	<b>8,500,495</b>
<b>III. Financial assets</b>									
	1. Shares in affiliated companies	15,566	-205	-30	1,015	0	0	0	16,346
	2. Shares in associated companies	41,760	0	-544	331	-3,632 <sup>1</sup>	0	-581	44,598
	3. Equity investments	10,215	128	0	7	66	-4,945	8	5,347
	4. Loans to companies in which participations are held	0	0	0	90	0	0	0	90
	5. Long-term securities	6,427	3	0	3,021	8	4,945	-11	14,377
	6. Other loans	67,993	56	0	2,949	2,166	0	-2	68,830
		<b>141,961</b>	<b>-18</b>	<b>-574</b>	<b>7,413</b>	<b>-1,392</b>	<b>0</b>	<b>-586</b>	<b>149,588</b>
		<b>9,706,194</b>	<b>60,270</b>	<b>4,677</b>	<b>620,238</b>	<b>570,733</b>	<b>0</b>	<b>9,775</b>	<b>9,830,421</b>

<sup>1</sup> Includes results from continuation of equity approach as well as disposal due to dividend payments

<sup>2</sup> Thereof shares in affiliated companies measured according to the equity method: EUR 630k

<sup>3</sup> Including effects from hyperinflation adjustments for the country Argentina in accordance with GAS 25

Depreciation/amortization									Net book values	
BUSINESS YEAR 2019										
Jan. 1, 2019	Jan. 1, 2019							Dec. 31, 2019	Dec. 31, 2019	Dec. 31, 2018
Accumulated depreciation/amortization	Currency translation	Changes at the Group	Depreciation/amortization of the business year	Write-ups of the business year	Disposals	Reclassifications	Currency translation of current year <sup>3</sup>	Accumulated depreciation/amortization	Net book values	Net book values
630,459	314	0	81,144	0	214,920	0	183	497,180	201,362	223,551
165,099	0	0	48,316	0	10,012	0	0	203,403	277,608	317,688
0	0	0	0	0	0	0	0	0	785	611
<b>795,558</b>	<b>314</b>	<b>0</b>	<b>129,460</b>	<b>0</b>	<b>224,932</b>	<b>0</b>	<b>183</b>	<b>700,583</b>	<b>479,755</b>	<b>541,850</b>
709,943	7,011	0	58,024	31	3,161	439	215	772,440	940,910	951,255
4,043,181	22,999	0	381,314	0	298,081	24	7,628	4,157,065	1,664,328	1,575,813
328,594	4,067	0	44,517	0	19,636	-101	354	357,795	158,581	139,695
8,517	18	0	2,774	0	180	-362	15	10,782	438,594	469,827
<b>5,090,235</b>	<b>34,095</b>	<b>0</b>	<b>486,629</b>	<b>31</b>	<b>321,058</b>	<b>0</b>	<b>8,212</b>	<b>5,298,082</b>	<b>3,202,413</b>	<b>3,136,590</b>
13,062	-246	0	501	0	0	0	-2	13,315	3,031	2,504
2,646	0	0	322	0	0	0	0	2,968	41,630 <sup>2</sup>	39,114
70	1	0	0	0	0	-71	0	0	5,347	10,145
0	0	0	0	0	0	0	0	0	90	0
1,519	2	0	346	6	0	71	0	1,932	12,445	4,908
24,019	-33	0	2,123	111	0	0	0	25,998	42,832	43,974
<b>41,316</b>	<b>-276</b>	<b>0</b>	<b>3,292</b>	<b>117</b>	<b>0</b>	<b>0</b>	<b>-2</b>	<b>44,213</b>	<b>105,375</b>	<b>100,645</b>
<b>5,927,109</b>	<b>34,133</b>	<b>0</b>	<b>619,381</b>	<b>148</b>	<b>545,990</b>	<b>0</b>	<b>8,393</b>	<b>6,042,878</b>	<b>3,787,543</b>	<b>3,779,085</b>

# Shareholdings

Shareholdings in companies included in consolidation, associated companies, proportionately consolidated companies, and other companies which serve the permanent business operations.

AS AT DECEMBER 31, 2019

NAME AND LOCATION	Share in equity in %
PARENT COMPANY	
MAHLE GmbH, Stuttgart/Germany	
<b>1. Fully consolidated subsidiaries</b>	
<b>a) Fully consolidated subsidiaries of MAHLE GmbH with direct shareholding quota</b>	
Conso, LLC, Wilmington, Delaware/USA	100.00
MAHLE Aftermarket Deutschland GmbH, Gunningen/Germany	100.00
MAHLE Aftermarket France SAS, Décines/France	100.00
MAHLE Aftermarket GmbH, Stuttgart/Germany	100.00
MAHLE Aftermarket Inc., Farmington Hills, Michigan/USA	100.00
MAHLE Aftermarket Italy S.p.A., Parma/Italy	80.00
MAHLE Aftermarket Ltd., Bilston/Great Britain	100.00
MAHLE Aftermarket Otomotiv Ticaret Anonim Şirketi, Izmir/Turkey	100.00
MAHLE Aftermarket Pte. Ltd., Singapore/Singapore	100.00
MAHLE Aftermarket S. de R.L. de C.V., Lerma/Mexico	100.00
MAHLE Aftermarket S.L.U., Alcalá de Henares/Spain	100.00
MAHLE Aftermarket SAS, Rouffach/France	100.00
MAHLE Amovis GmbH, Berlin/Germany	100.00
MAHLE ANAND Filter Systems Private Limited, Gurgaon/India	50.00 <sup>1</sup>
MAHLE Anéis Participações Ltda., Mogi Guaçu/Brazil	100.00
MAHLE Automotive Technologies (China) Co., Ltd., Shanghai/China	100.00
MAHLE Automotive Technologies (Suzhou) Co., Ltd., Changshu/China	100.00
MAHLE Behr GmbH & Co. KG, Stuttgart/Germany	62.46
MAHLE Behr Verwaltung GmbH, Stuttgart/Germany	60.71
MAHLE Beteiligungen GmbH, Stuttgart/Germany	100.00
MAHLE Blechtechnologie GmbH, Stuttgart/Germany	100.00
MAHLE Brandenburg GmbH, Wustermark/Germany	100.00
MAHLE Componente de Motor SRL, Timisoara/Romania	100.00
MAHLE Componentes de Motor de México, S. de R.L. de C.V., Ramos Arizpe/Mexico	100.00
MAHLE Componentes de Motores S.A., Murte de Portugal	100.00
MAHLE Componenti Motori Italia S.p.A., La Loggia/Italy	100.00
MAHLE Composants Moteur France SAS, Chavanod/France	100.00
MAHLE Compresores, S. de R.L. de C.V., Juarez/Mexico	100.00
MAHLE Compressores do Brasil Ltda., Jaguariúna/Brazil	100.00
MAHLE Compressors (Suzhou) Co., Ltd., Changshu/China	100.00
MAHLE Compressors Hungary Kft., Balassagyarmat/Hungary	100.00
MAHLE de México S. de R.L. de C.V., Ramos Arizpe/Mexico	100.00
MAHLE Donghyun Filter Systems Co., Ltd., Hwasung/South Korea	100.00
MAHLE Ebikemotion S.L.U., Palencia/Spain	100.00
MAHLE Electric Drives (Taicang) Co., Ltd., Taicang City/China	99.87
MAHLE Electric Drives Bel OOO, Grodno/Belarus	100.00
MAHLE Electric Drives Bosnia d.o.o., Laktaši/Bosnia and Herzegovina	100.00
MAHLE Electric Drives Bovec d.o.o., Bovec/Slovenia	100.00
MAHLE Electric Drives India Private Limited, Coimbatore/India	90.00

AS AT DECEMBER 31, 2019

NAME AND LOCATION	Share in equity in %
MAHLE Electric Drives Italy S.r.l., Reggio Emilia/Italy	100.00
MAHLE Electric Drives Japan Corporation, Numazu-shi, Shizuoka/Japan	100.00
MAHLE Electric Drives Komen d.o.o., Komen/Slovenia	100.00
MAHLE Electric Drives Slovenija d.o.o., Šempeter pri Gorici/Slovenia	100.00
MAHLE Electronics S.L.U., Motilla del Palancar/Spain	100.00
MAHLE Engine Components (Chongqing) Co., Ltd., Chongqing/China	100.00
MAHLE Engine Components (Nanjing) Co., Ltd., Nanjing/China	100.00
MAHLE Engine Components (Thailand) Co., Ltd., Bangkok/Thailand	99.75
MAHLE Engine Components (Yingkou) Co., Ltd., Yingkou/China	100.00
MAHLE Engine Components India Private Limited, Pithampur/India	100.00
MAHLE Engine Components Japan Corporation, Okegawa-shi/Japan	100.00
MAHLE Engine Components Slovakia s.r.o., Dolný Kubín/Slovakia	100.00
MAHLE Engine Components USA, Inc., Morristown, Tennessee/USA	100.00
MAHLE Engine Systems UK Ltd., Kilmarnock/Great Britain	100.00
MAHLE Engineering Services India Private Limited, Pune/India	40.00 <sup>2</sup>
MAHLE Filter Systems (Tianjin) Co., Ltd., Tianjin/China	100.00
MAHLE Filter Systems Canada, ULC, Tilbury/Canada	100.00
MAHLE Filter Systems Japan Corporation, Tokyo/Japan	100.00
MAHLE Filter Systems Land Corporation, Cavite/Philippines	66.67
MAHLE Filter Systems North America, Inc., Troy, Michigan/USA	100.00
MAHLE Filter Systems Philippines Corporation, Cavite/Philippines	100.00
MAHLE Filter Systems UK Ltd., Telford/Great Britain	100.00
MAHLE Filtersysteme Austria GmbH, St. Michael ob Bleiburg/Austria	100.00
MAHLE Filtersysteme France SAS, Seboncourt/France	100.00
MAHLE Filtersysteme GmbH, Stuttgart/Germany	100.00
MAHLE Filtration Systems (Hubei) Co., Ltd., Wuhan/China	100.00
MAHLE Filtre Sistemleri A.S., Gebze/Turkey	100.00
MAHLE France SAS, Rouffach/France	100.00
MAHLE Guangzhou Filter Systems Co., Ltd., Guangzhou/China	100.00
MAHLE Holding (China) Co., Ltd., Shanghai/China	100.00
MAHLE Holding (India) Private Limited, Gurgaon/India	100.00
MAHLE Holding Austria GmbH, St. Michael ob Bleiburg/Austria	100.00
MAHLE Holding España S.L.U., Montblanc/Spain	100.00
MAHLE Immobilien GmbH, Stuttgart/Germany	100.00
MAHLE Immobilien Schweiz AG, Grenchen/Switzerland	100.00
MAHLE Indústria e Comércio Ltda., Mogi Guaçu/Brazil	100.00
MAHLE Industrial Thermal Systems GmbH & Co. KG, Stuttgart/Germany	60.00 <sup>2</sup>
MAHLE Industriebeteiligungen GmbH, Stuttgart/Germany	100.00
MAHLE Industriemotoren-Komponenten GmbH, Stuttgart/Germany	100.00
MAHLE Industries UK Ltd., Rugby/Great Britain	100.00
MAHLE Industries, Incorporated, Farmington Hills, Michigan/USA	100.00
MAHLE International GmbH, Stuttgart/Germany	100.00
MAHLE Japan Ltd., Tokyo/Japan	100.00
MAHLE Kleinmotoren-Komponenten GmbH & Co. KG, Stuttgart/Germany	100.00



## AS AT DECEMBER 31, 2019

NAME AND LOCATION	Share in equity in %
MAHLE Luxembourg Sàrl, Foetz/Luxembourg	100.00
MAHLE Manufacturing Management, Inc., Farmington Hills, Michigan/USA	100.00
MAHLE Manufacturing Service Japan Corporation, Tokyo/Japan	100.00
MAHLE Metal Leve S.A., Mogi Guaçu/Brazil	70.00
MAHLE Motor Parçaları San. ve Tic. A.Ş., Izmir/Turkey	100.00
MAHLE Polska Spółka z o.o., Krotoszyn/Poland	100.00
MAHLE Powertrain, LLC, Plymouth, Michigan/USA	100.00
MAHLE Powertrain GmbH, Stuttgart/Germany	100.00
MAHLE Powertrain Ltd., Northampton/Great Britain	100.00
MAHLE RUS, OOO, Dobrino/Russia	100.00
MAHLE S.A.U., Vilanova i la Geltrú/Spain	100.00
MAHLE Services (Thailand) Ltd., Samut Prakan/Thailand	100.00
MAHLE Shanghai Filter Systems Co., Ltd., Shanghai/China	95.00
MAHLE Shared Services México, S. de R.L. de C.V., Monterrey/Mexico	100.00
MAHLE Shared Services Poland Spółka z o.o., Wrocław/Poland	100.00
MAHLE Siam Electric Drives Co. Ltd., Samut Prakan/Thailand	100.00
MAHLE Siam Filter Systems Co., Ltd., Samut Prakan/Thailand	74.90
MAHLE Sistemas de Filtración de México S.A. de C.V., Monterrey/Mexico	100.00
MAHLE Trading (Shanghai) Co., Ltd., Shanghai/China	100.00
MAHLE Trading Japan Co., Ltd., Tokyo/Japan	100.00
MAHLE Tri-Ring Valve Train (Hubei) Co., Ltd., Macheng/China	65.00
MAHLE Ventiltrieb GmbH, Stuttgart/Germany	100.00
MAHLE Versicherungsvermittlung GmbH, Stuttgart/Germany	100.00
MAHLE Vöcklabruck GmbH, Vöcklabruck/Austria	100.00
MAHLE ZG Transmissions GmbH, Eching/Germany	100.00
MG Immobilienentwicklungs- und Ansiedlungsgesellschaft mbH, Wolfsberg/Austria	100.00
OSCON, LLC, Wilmington, Delaware/USA	100.00
PT. MAHLE Filter Systems Indonesia, Pasirranji/Indonesia	100.00
PT. MAHLE Indonesia, Pasirranji/Indonesia	100.00
S.C.I. Daudet, Décines/France	100.00
<b>b) Fully consolidated subsidiaries of MAHLE Behr GmbH &amp; Co. KG with direct shareholding quota</b>	
MAHLE ANAND Thermal Systems Private Limited, Chakan/India	60.00
MAHLE Behr Berga GmbH, Kornwestheim/Germany	100.00
MAHLE Behr Charleston Inc., Charleston, South Carolina/USA	100.00
MAHLE Behr Components Spain S.L.U., L'Espluga de Francolí/Spain	100.00
MAHLE Behr Dayton L.L.C., Dayton, Ohio/USA	100.00
MAHLE Behr France Hambach S.A.S., Hambach/France	100.00
MAHLE Behr France Rouffach S.A.S., Rouffach/France	100.00
MAHLE Behr Gerenciamento Térmico Brasil Ltda., Arujá/Brazil	100.00

AS AT DECEMBER 31, 2019

NAME AND LOCATION	Share in equity in %
MAHLE Behr Holding Deutschland GmbH, Stuttgart/Germany	100.00
MAHLE Behr Holding GmbH, Stuttgart/Germany	100.00
MAHLE Behr Holýšov s.r.o., Holýšov/Czech Republic	100.00
MAHLE Behr Italy s.r.l., Grugliasco/Italy	100.00
MAHLE Behr Japan K.K., Tokyo/Japan	100.00
MAHLE Behr Kirchberg GmbH, Kirchberg/Germany	100.00
MAHLE Behr Korea Inc., Busan/South Korea	100.00
MAHLE Behr Luxembourg Sàrl, Foetz/Luxembourg	100.00
MAHLE Behr Manufacturing Management, Inc., Troy, Michigan/USA	100.00
MAHLE Behr Mexico, S. de R.L. de C.V., Ramos Arizpe/Mexico	100.00
MAHLE Behr Mnichovo Hradiště s.r.o., Mnichovo Hradiště/Czech Republic	100.00
MAHLE Behr Námestovo s.r.o., Námestovo/Slovakia	100.00
MAHLE Behr Ostrava s.r.o., Mošnov/Czech Republic	100.00
MAHLE Behr Ostrov s.r.o., Mnichovo Hradiště/Czech Republic	100.00
MAHLE Behr Ostrów Wielkopolski Sp. z o.o., Ostrów Wielkopolski/Poland	100.00
MAHLE Behr Rio Bravo, S. de R.L. de C.V., Ramos Arizpe/Mexico	100.00
MAHLE BEHR RUS LLC, St. Petersburg/Russia	100.00
MAHLE Behr Senica s.r.o., Senica/Slovakia	100.00
MAHLE Behr Service America L.L.C., Troy, Michigan/USA	100.00
MAHLE Behr Service Asia Co., Ltd., Shanghai/China	100.00
MAHLE Behr Service GmbH, Stuttgart/Germany	100.00
MAHLE Behr Service Mexico, S. de R.L. de C.V., Ramos Arizpe/Mexico	100.00
MAHLE Behr South Africa (Pty) Ltd., Durban/South Africa	100.00
MAHLE Behr Spain S.A.U., Montblanc/Spain	100.00
MAHLE Behr (Thailand) Co., Ltd., Samut Prakan/Thailand	100.00
MAHLE Behr Thermal Systems (Jinan) Co., Ltd., Jinan/China	100.00
MAHLE Behr Thermal Systems (Qingdao) Co., Ltd., Qingdao/China	100.00
MAHLE Behr USA Inc., Troy, Michigan/USA	100.00
MAHLE Engineering Services India Private Limited, Pune/India	60.00 <sup>2</sup>
MAHLE Industrial Thermal Systems GmbH & Co. KG, Stuttgart/Germany	40.00 <sup>2</sup>
<b>c) Fully consolidated subsidiaries of MAHLE Metal Leve S.A. with direct shareholding quota</b>	
MAHLE Argentina S.A., Rafaela/Argentina	100.00
MAHLE Filtróil Indústria e Comércio de Filtros Ltda., Mogi Guaçu/Brazil	60.00
MAHLE Hirschvogel Forjas S.A., Queimados/Brazil	51.00
MAHLE Metal Leve GmbH, St. Michael ob Bleiburg/Austria	100.00
<b>d) Fully consolidated subsidiaries of MAHLE Industrial Thermal Systems GmbH &amp; Co. KG with direct shareholding quota</b>	
MAHLE Industrial Thermal Systems (Tianjin) Co., Ltd., Tianjin/China	100.00
MAHLE Industrial Thermal Systems America, L.P., Belmont, Michigan/USA	99.00

AS AT DECEMBER 31, 2019

NAME AND LOCATION	Share in equity in %
<b>2. Affiliated companies, not consolidated on account of their immateriality for the presentation of the net assets, financial position, and results of operations</b>	
<b>a) Affiliated companies of MAHLE Behr GmbH &amp; Co. KG with direct shareholding quota</b>	
MAHLE Behr Sweden AB, Gothenburg/Sweden	100.00
<b>b) Other affiliated companies with direct shareholding quota</b>	
Compañía Rosarina S.A., Rosario/Argentina	99.99
Eito Denki Co. Ltd., Gojōme-machi, Akita/Japan	66.75
MAHLE Engine Components Australia Pty Ltd., Melbourne/Australia	100.00 <sup>a</sup>
MAHLE Industrial Thermal Systems America, Inc., Belmont, Michigan/USA	100.00
MAHLE Industrial Thermal Systems Verwaltung GmbH, Stuttgart/Germany	100.00
MAHLE Kleinmotoren-Komponenten Verwaltungs GmbH, Stuttgart/Germany	100.00
MAHLE Thermoelektronik GmbH, Duisburg/Germany	100.00
Retromotion GmbH, Stuttgart/Germany	72.20
Ueno Industry Co. Ltd., Tokyo/Japan	100.00
Ueno Tech Co., Ltd., Tokyo/Japan	100.00
<b>3. Proportionately consolidated companies</b>	
<b>a) Subgroup Behr-Hella Thermocontrol that is managed by MAHLE Behr GmbH &amp; Co. KG and another company</b>	
PARENT COMPANY	
Behr-Hella Thermocontrol GmbH, Stuttgart/Germany	50.00
<b>Companies included in subgroup accounts of Behr-Hella Thermocontrol GmbH with direct shareholding quota</b>	
Behr-Hella Thermocontrol (Shanghai) Co., Ltd., Shanghai/China	100.00
Behr-Hella Thermocontrol EOOD, Bozhurishte/Bulgaria	100.00
Behr-Hella Thermocontrol Inc., Farmington Hills, Michigan/USA	100.00
Behr-Hella Thermocontrol India Private Limited, Pune/India	100.00
Behr-Hella Thermocontrol Japan K.K., Atsugi/Japan	100.00
BHTC Finland Oy, Tampere/Finland	100.00
BHTC Mexico S.A. de C.V., San Miguel de Allende/Mexico	100.00
<b>b) Subgroup Behr Hella Service that is managed by MAHLE Behr GmbH &amp; Co. KG and another company</b>	
PARENT COMPANY	
Behr Hella Service GmbH, Schwäbisch Hall/Germany	50.00
<b>Companies included in subgroup accounts of Behr Hella Service GmbH with direct shareholding quota</b>	
Behr Hella Comércio de Peças Automotivas S.A., Arujá/Brazil	100.00
Behr Hella Service North America L.L.C., Peachtree City, Georgia/USA	100.00
Behr Hella Service South Africa (Pty) Ltd., Johannesburg/South Africa	100.00
Behr Service IAM USA Inc., Troy, Michigan/USA	100.00

AS AT DECEMBER 31, 2019

NAME AND LOCATION	Share in equity in %
<b>c) Proportionately consolidated group of companies that is managed by MAHLE Behr GmbH &amp; Co. KG and another company</b>	
PARENT COMPANY	
Shanghai MAHLE Thermal Systems Co., Ltd., Shanghai/China	50.00
<b>Subsidiaries with direct shareholding quota</b>	
Chengdu MAHLE Automotive Thermal Systems Co., Ltd., Chengdu/China	100.00
Shenyang MAHLE Automotive Thermal Systems Co., Ltd., Shenyang/China	100.00
Ningde MAHLE Automotive Thermal Systems Co. Ltd., Ningde/China	100.00
<b>d) Other proportionately consolidated companies with direct shareholding quota that are managed by MAHLE Behr GmbH &amp; Co. KG and another company</b>	
Dongfeng MAHLE Thermal Systems Co., Ltd., Wuhan/China	50.00
<b>4. Associated companies, consolidated using the equity method</b>	
<b>a) Associated companies of MAHLE Behr GmbH &amp; Co. KG with direct shareholding quota</b>	
Dongfeng-Paninco Automobile Aluminum Heat Exchanger Co. Ltd., Shiyang/China	50.00
<b>b) Associated companies of MAHLE Metal Leve S.A. with direct shareholding quota</b>	
Innoferm Tecnologia Ltda., Mogi Guaçu/Brazil	33.33 <sup>4</sup>
<b>c) Other associated companies with direct shareholding quota</b>	
Cofap Companhia Fabricadora de Peças Ltda., Mogi Guaçu/Brazil	31.65
India Nippon Electricals Ltd., Chennai/India	20.52
LangFang Kokusan Electric Co., Ltd., Langfang/China	40.00
MAHLE König GmbH, Rankweil/Austria	50.00
MAHLE König Kommanditgesellschaft GmbH & Co. KG, Rankweil/Austria	50.00
Pt Federal Izumi Manufacturing, Bogor/Indonesia	36.94
SiEVA d.o.o., Šempeter pri Gorici/Slovenia	20.00 <sup>4</sup>

<sup>1</sup> Shareholding 50% + 1 share

<sup>2</sup> From the Group's perspective, company is included by 100%

<sup>3</sup> Affiliated company, consolidated using the equity method

<sup>4</sup> The company was not measured using the equity method on account of its immateriality for the presentation of the net assets, financial position, and results of operations

# Auditor's report

This audit report is issued on financial statements prepared in German language.

## Independent auditor's report

To MAHLE GmbH, Stuttgart

### Audit Opinions

We have audited the consolidated financial statements of MAHLE GmbH, Stuttgart, and its subsidiaries (the Group), which comprise the consolidated balance sheet as at 31 December 2019, and the consolidated income statement, consolidated cash flow statement, and consolidated statement of changes in equity for the financial year from 1 January to 31 December 2019, and notes to the consolidated financial statements, including the presentation of the recognition and measurement policies. In addition, we have audited the group management report of MAHLE GmbH for the financial year from 1 January to 31 December 2019.

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 requirements of German commercial law and give a true and fair view of the assets, liabilities and financial position of the Group as at 31 December 2019 and of its financial performance for the financial year from 1 January to 31 December 2019 in compliance with German Legally Required Accounting Principles, 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 § [Article] 322 Abs. [paragraph] 3 Satz [sentence] 1 HGB [Handelsgesetzbuch: German Commercial Code], 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 Audit Opinions

We conducted our audit of the consolidated financial statements and of the group management report in accordance with § 317 HGB 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 audit opinions on the consolidated financial statements and on the group management report.

### Other Information

The executive directors are responsible for the other information. The other information comprises the annual report – excluding cross-references to external information – with the exception of the audited consolidated financial statements, the audited group management report and our auditor's report.

Our audit 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 audit 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 the requirements of German commercial law, and 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 German Legally Required Accounting Principles. In addition, the executive directors are responsible for such internal control as they, in accordance with German Legally Required Accounting Principles, 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, provided no actual or legal circumstances conflict therewith.

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 audit 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 § 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 audit 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 audit 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 audit 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 German Legally Required Accounting Principles.

- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express audit 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 audit 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 audit 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.

Stuttgart, March 20, 2020

**PricewaterhouseCoopers GmbH**

Wirtschaftsprüfungsgesellschaft

**sgd. Jürgen Berghaus**

Wirtschaftsprüfer  
(German Public Auditor)

**sgd. ppa. Renate Berghoff**

Wirtschaftsprüferin  
(German Public Auditor)

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